PARRAMATTA LIGHT RAIL (STAGE 1)

Westmead to Carlingford via Parramatta CBD

Environmental Impact Statement

City of Parramatta Council Submission to the NSW Department of Planning and Environment

November 2017

CITY OF PARRAMATTA

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Abbreviations	
Council	City of Parramatta Council
DCP	Development Control Plan
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement (for Parramatta Light Rail Stage 1)
ILUIIP	Greater Parramatta Interim Land Use and Infrastructure Implementation Plan
GPOP	Greater Parramatta and Olympic Peninsula
GPAP	Greater Parramatta Access Plan
LAHC	Land and Housing Corporation
LEP	Local Environmental Plan
OEH	NSW Office of Environment and Heritage
Project	Parramatta Light Rail Stage 1
PLEP	Parramatta Local Environmental Plan 2011
PNUT	Parramatta North Urban Transformation precinct
RMS	NSW Roads and Maritime Authority
SEARs	Secretary's Environmental Assessment Requirements (for Parramatta Light Rail Stage 1)
SHR	State Heritage Register
SOP	Sydney Olympic Park
SSI	State Significant Infrastructure
TfNSW	Transport for NSW / the Applicant
WSLHD	Western Sydney Local Health District
WSU	Western Sydney University

1.0 Executive Summary

1.1 Introduction

City of Parramatta Council (Council) is strongly supportive of the Parramatta Light Rail – Stage 1 project. Council believes that the delivery of a high quality light rail service will contribute to Parramatta being Sydney's Central City and Australia's next great city. Council supports Light Rail as it will:

- Significantly improve public transport options and connectivity across part of the City of Parramatta local government area;
- Support the significant growth projected across the Greater Parramatta area
- Will connect major employment centres and activity nodes
- Will connect existing and new residential communities
- Will be the first stage of a new light rail 'network' centred around Parramatta CBD
- Will facilitate improvements to the public domain

Council welcomes the opportunity to comment on the Environmental Impact Statement (EIS). The EIS is a comprehensive document which describes the background and strategic needs for the light rail project, the development of the project, including options considered, and the proposed design, construction and operation. It also assesses impacts on a regional and local (by precinct) basis and associated environmental management and mitigation measures proposed to address identified impacts.

Council's detailed response to the EIS is contained in Section 2 to 14 of this Submission. Appendix A provides for a Summary of Recommendations and Recommended Conditions of Consent. Appendix B is Council's Parramatta Light Rail Framework Plan (Volume 1) and Appendix B is Parramatta Light Rail Stage 1 Technical Requirements (Volume 2).

Council has been working closely with the Applicant, Transport for NSW (TfNSW) to ensure a superior outcome for the entire corridor. Council and Transport for NSW have entered into a non-binding Terms Sheet that sets out the guiding principles and framework for the preparation of a Development Deed.

Council is currently negotiating a binding Development Deed with TfNSW, which will set out the scope, rights and obligations and commercial requirements for the delivery and operational phases of the Project. Council is preparing Urban Design Requirements with TfNSW, to append to the Development Deed, to ensure the requirements for the public realm in relation to the areas dealt with in the Development Deed are clearly communicated and are satisfactory to Council and consistent with Council's adopted Position Paper on Parramatta Light Rail, which is summarised in Section 1.1 below.

Council has established a Parramatta Light Rail Community and Business Advisory Committee and welcome the Applicant's commitment for ongoing community consultation. Effective and timely community engagement is critical for a construction project of this size. Council would like to continue to work together with TfNSW to engage with the community throughout the construction of the Project.

1.2 Position of City of Parramatta Council

Council has consistently advocated and planned for light rail to service Parramatta. In 2013, Parramatta City Council commissioned an initial feasibility study into light rail for Western Sydney. The Study cost Council $1 million and evaluated a number of potential routes.

In 2014 the NSW Government shortlisted four corridors where light rail could play a key role in improving transport connections and cater for future growth. In December 2015, the NSW Government announced the first stage of the Parramatta Light Rail network, from Westmead through to Parramatta North, Parramatta CBD, Camellia, Silverwater, Sydney Olympic Park and Strathfield, with a spur line running north to Carlingford from Camellia.

On 17 February 2017, the NSW Government announced that the preferred first stage is to connect Westmead to Parramatta and Carlingford via Camellia. The preferred route for Stage 2 was announced on the 18 October 2017 and links Rydalmere to Sydney Olympic Park and Carter Street via Melrose Park and Wentworth Point.

Council adopted a Position Paper on Parramatta Light Rail on 10 October 2016 which articulated Council's aspiration for light rail. Council's high level aspiration for the Parramatta Light Rail is as follows:

> *"Parramatta Light Rail will greatly improve how people move across the local government area and experience the Parramatta CBD and surrounding suburbs. It will be pedestrian focused and promote vibrant, activated streets. It will utilise the highest quality materials, have a coherent presentation and integrate seamlessly with the public domain. It will connect residents, workers and visitors to jobs, services, education, recreation, major events and the wider transport network."*

The purpose of the Position Paper was to provide strategic direction for Council in consulting with NSW Government and other stakeholders; and to provide policy context for more design work to be undertaken in preparing for the Light Rail. The Position Paper outlines the following eight objectives (noting that each objective has corresponding detailed principles):

- Provide a high quality integrated transport service.
- Provide a high quality public domain and great places.
- Facilitate and promote urban renewal and revitalisation.
- Respect Parramatta's unique heritage and character.
- Support local businesses and employment.
- Provide high quality environmental outcomes.
- Provide high quality safety outcomes.
- Manage construction impacts effectively and efficiently.

These objectives and principles have been used to formulate Council's response to key issues contained in this submission.

1.3 Summary of Key Issues

Council has reviewed the EIS, and the attached detailed submission identifies the following key issues:

- Design Detail - Council is concerned in relation to the lack of design detail of the Project presented in the EIS. Given the limited design detail in the EIS, Council has prepared the key reference documents - the City of Parramatta Light Rail Urban Design Framework

(Volume 1) and Technical Requirements (Volume 2). Council request these are to be incorporated into the final Urban Design Requirements for the Project.

- Closure of the T6 Line - Council supports the retention of the existing tracks between Camellia and Clyde and ownership of the land remain with Transport for NSW, pending a further detailed assessment of future transport needs, including Light Rail (future stages), Sydney Mero West and the heavy rail network.
- Parking - It is estimated that approximately 860 on street parking spaces will be directly impacted by the Project. Whilst it is acknowledged that in an urbanising area, less parking is needed when users switch to other modes of travel, however parking remains a priority for people who drive. The relocation of impacted parking, especially those people with mobility parking requirements, should be carefully considered. Council is supportive of the preparation of a Parking Offset and Management Strategy in consultation with Council, businesses and stakeholders.
- Economic Impacts - Although the delivery of the Project will stimulate economic development and regeneration along the route, there will be impacts on local business during the construction phase. Council supports the preparation of a Construction Management Plan which details plans and programs that specially address the economic impacts and provides costed business continuity strategies for commercial centres along the corridor.
- Community Engagement - Council recommends the preparation of a Community Engagement Strategy which outlines the procedures and mechanisms for which the community and key stakeholders are disseminated information and can discuss or provide feedback to the Project Team. Council recommends the establishment of a Community Reference Group, a Business Reference Group and a specific Church Street Working Group.
- Impact on Trees - The Project impacts on an estimated over 2,000 trees along the corridor. The EIS does not provide a detailed assessment of significance, delineate or assess the significance levels of the impacted trees or identify hollow-bearing trees. The design and location of the Project needs to minimise removal of highly significant trees.
- Flooding - Nearly all of the Light Rail route is affected by flooding, either by rising waters from Parramatta River, Clay Cliff Creek and other tributaries, or by overland flow in the sub-catchments from major rainfall events. The design and operation of the Light Rail infrastructure is crucial in mitigating flood risks on the service and also on neighbouring property. Council requests conditions of consent regarding design and operation of the Project to minimise risk and maximise safety during flooding events.
- Robin Thomas Reserve - A portion of Robin Thomas Reserve will be impacted by the Project. Council requests the preparation of a revised Master Plan in collaboration with Council and in consultation with the community. The Master Plan needs to demonstrate that there is an enhanced standard of public open space and amenity within Robin Thomas Reserve and any immediately adjoining public land.
- Heritage Impacts – Council is concerned in relation to the impact of the Project on heritage parks, heritage trees, heritage items and both Aboriginal and historic archaeology. The Submission recommends either further work be undertaken or key mitigation measures in order to minimise the impact of these significant heritage items.

Specifically, Council strongly supports the following investigations or modifications prior to determination:

- It is acknowledged that the Project will have a significant impact on traffic, in particular in the Parramatta CBD and Westmead. Council requests the Applicant undertake an update

of the traffic model with revised inputs and further testing and assessment of the impact of intersection delays on the network and present further mitigation measures.

- Preparation of a draft Greater Parramatta Access Plan which determines the most appropriate mitigation measures to manage the impacts of significant traffic changes (particularly in Westmead and the Parramatta CBD) as a result of the construction and operation of the project.
- Revise the design of the Westmead Light Rail Stop to ensure an integrated multi modal interchange at Westmead Railway Station and seamless connection between heavy rail, bus T-way and future West Metro.
- Light Rail alignment changes at the following locations:
    - Hainsworth Street through to Factory Street, Parramatta North
    - George Street to Noller Parade and Tramway Avenue, Rosehill
    - Grand Avenue, Camellia
- Demonstrate that the retention of a single track at Pennant Hills Road, Carlingford does not compromise the future need for increased service frequencies, nor a proposed extension to Epping, and that the design and land requirements for this future-proofing are included as part of Stage 1.
- Proposed Light Rail Stop additions or changes:
    - Move Macquarie Street stop to the west of Civic Link;
    - Investigation of alternative stop locations along Church St (between Factory and Macquarie Streets);
    - Additional stop at Parramatta Park (in conjunction route alignment change);
    - Additional stop at WSU Rydalmere; and
    - Shifting the proposed Rydalmere stop location to the north.
- Future-proofing of the following elements:
    - Extension of the light rail to Epping via Carlingford Court.
    - Extension of the light rail south at Westmead.
    - Stops at Telopea South and Carlingford South.
    - An interchange with Parramatta Light Rail Stage 2 on South Street (associated with stop change at Rydalmere).
- Redesign of the Active Transport Link (ATL) from Carlingford to Camellia as a separated cycling and pedestrian link to cater for the projected patronage.
- Investigation of alternatives to avoid the removal of local heritage items, including the Royal Oak Hotel, abutments of Camellia (Parramatta River) Underbridge and Clyde Carlingford Bridge.
- Provide further details on the impact on trees, including quantify the extent of “minor”, “more than minor” and “full removal” impacts and an assessment of significance of all impacted trees (i.e. high, medium or low) and demonstrate how significant trees have been considered for retention.

Council’s detailed response to the EIS is contained in Sections below. Appendix A provides a consolidated Summary of Recommendations and Recommended Conditions of Consent.

2.0 Precincts

2.1 Introduction

This Section of the Submission undertakes a precinct specific analysis of each of the following Precincts:

- Westmead;
- Parramatta North;
- Parramatta CBD;
- Rosehill to Camellia; and
- Rydalmere to Carlingford.

The analysis is presented on the light rail alignment and stops contained in the EIS, referred to as the 'proposed alignment'. In addition, Council presents recommendations for alignment options, including alternative options to the light rail alignment and stops.

The Parramatta Light Rail Stage 1 Framework Plan (Volume 1) provides more detail in relation to key issues, strategies, alignment and stop options, and recommendations and requirements for design refinement. Volume 1 is provided at Appendix B of this Submission. The main purpose of Volume 1 is twofold:

- To inform DPE and the Applicant of Council's design position on the proposed alignment and recommendations to alternate options for the alignment and stops; and
- To inform the preparation of TfNSW Urban Design Requirements and to provide a framework through which any changes proposed by TfNSW or the contractor can begin to be evaluated.

2.2 Westmead

2.2.1 Introduction

It is acknowledged that the Project will deliver significant public transport benefits to visitors, workers and residents of Westmead. The Westmead Precinct represents the largest concentration of hospital and health services in Australia, serving Western Sydney and the wider Sydney metropolitan area. A Plan for Growing Sydney aims to further grow and enhance Westmead's role as a vibrant health precinct and key employment centre.

Significant investment is currently planned for the Precinct including $750M for the Westmead Redevelopment which includes a new central acute services building, $95M for The Children's Hospital at Westmead, a commitment of $55M for Stage 1 of a $500M investment over 20 years by The University of Sydney, a new $60M Ronald McDonald House, as well as proposed expansions to The Westmead Institute for Medical Research and Children's Medical Research Institute.

The DPE's Draft Greater Parramatta Interim Land Use and Infrastructure Implementation Plan (ILUIIP) identifies Westmead as a Health and Education Precinct identifying that an additional 30,000 jobs could be provided in Westmead by 2036. The precinct contained approximately 5,240 dwellings (2016, ABS) and 15,000 jobs (ILUIIP) but these figures are expected to increase significantly over the coming years given the above mentioned investment already committed within the precinct to expand and increase services and facilities and potential growth in both residential dwellings and jobs.

Westmead has been declared a Priority Precinct by DPE. The Priority Precinct includes land north and south of the railway line. The master planning for the northern part of Westmead (north of the railway line) is being led by the City of Parramatta Council and WSLHD, in conjunction with the Westmead Alliance and other key stakeholders, to realise its potential as a world-class Innovation District and to harness the significant opportunities provided by current investment in the area.

The master planning for the southern part of Westmead (south of the railway line) is being led by DPE in collaboration with Cumberland Council. The focus for this work is delivering additional homes and supporting infrastructure, such an open space and schools.

A Project Control Group, which includes all the above mentioned stakeholders, governs the separate but connected master planning components to ensure an integrated planning approach to the entire Priority Precinct.

In line with the above planning processes and the level of growth envisaged for Westmead, this will generate significant user demand (both existing and new residents and employee) for the proposed light rail. Council would like to ensure that the Project delivers a high quality corridor, which attracts and supports workers, residents and visitors and is integrated with the existing and planned public transport nodes.

2.2.2 Proposed Alignment Analysis

The alignment through Westmead locates the Westmead light rail terminus along Hawkesbury Road between Railway Parade and Darcy Road. From this point it curves onto Hawkesbury Road into a centre alignment with stops at Westmead Main Hospital, in the vicinity of the new plaza and Acute Services Building; and Westmead Children's Hospital and existing plaza entry, prior to turning down Hainsworth Street to Parramatta North.

Council's key desired outcomes for Westmead are to support a competitive Innovation District and a diverse community. Hawkesbury Road will become a public address to each of the medical research institutes and Hospitals, a central point of orientation, and a place for people. It will be known as a comfortable, green pedestrian avenue with safe and legible connections that allow effortless interchange between transport modes and support the needs of visitors and the community. Its buildings, squares and streetscape will offer places to eat, rest and gather. It will celebrate the historic and natural assets of Westmead, capitalising on their value to deliver a high quality precinct that attracts new skilled workers, residents and investment. New local connections will be characterised by large canopy trees and green infrastructure which links active and public transport networks at Parramatta Park, Toongabbie Creek, Parramatta River, the Cumberland Hospital, the T-Way and the Westmead Interchange.

Hawkesbury Road

The light rail alignment along Hawkesbury Road is generally supported as it can achieve significant benefits to the Westmead Precinct. An alignment along Hawkesbury Road provides an opportunity for a whole of street upgrade which can achieve a new pedestrian spine and public address, assist to upgrade aged public infrastructure, a consistent and integrated public domain, unlocks traffic and transport barriers.

A key outcome for the Project along Hawkesbury Road should be a strong street design comprising large canopy street trees, generous consistent and upgraded footpaths and vegetated tracks. This will provide the continuity and legibility required for a high degree of pedestrian amenity. Light Rail must deliver a whole of street upgrade to Hawkesbury Road that establishes a highly identifiable streetscape and which promotes an activated street edge which supports the health, research and education precinct and the surrounding community.

The three stops proposed within this sequence all require further consideration during design development. It is unclear how any of the stops proposed will provide a clear and consistent streetscape, seamlessly knit into the public plazas planned by NSW Health or how this long term asset will service future growth and development within the precinct. A consistent stop arrangement is preferred (currently side and central platforms planned).

Council acknowledges that vehicle access to the Hospitals, clinics and research institutions, including emergency vehicles will be maintained along Hawkesbury Road.

Further design work is required to be carried out by the Applicant to demonstrate how this will be achieved. It is of paramount importance to prioritise all aspects of pedestrian amenity, safety, walkability, accessibility and connectivity along Hawkesbury Road.

Westmead Interchange

As noted in the EIS, one of the specific benefits of the project is to "integrate with heavy rail and buses at the proposed Westmead stop". However, Council is concerned that the current position of the final Westmead stop does not adequately achieve this. The proposed Westmead Station stop does not contribute to the upgrade of the existing Westmead Railway Station, address Universal Access requirements to create an effortless interchange with the Westmead Railway Station, the Bus T-way or the future Sydney Metro West. Currently identified in the EIS, the light rail stop requires users to climb up or down to change between modes and the design also introduces a curvature to the alignment which compromises the strength and simplicity of the streetscape, distorts the street profile and prevents the alignment from extending South of Westmead heavy rail station. Council would like these issues to be addressed by the Applicant prior to approval.

2.2.3 Alignment Options

To address the current poor integration of the Westmead Station Light Rail stop with the Westmead Railway Station, Council outlines the following two options and requests the Applicant to consider these options prior to approval. Either one would address accessibility and integration concerns, as well as provide opportunity for the Light Rail to extend further south.

Option 1 - Westmead Light Rail Terminus – A new Railway Bridge Overpass

An alternative to the location of the Westmead light rail terminus identified is to position the light rail terminus alongside traffic lanes and footways on a new bridge overpass between Alexandra Avenue and Railway Parade. Whilst this would require an investment in new bridge infrastructure, stacking the light rail terminus above Westmead Train Station would provide an integrated public domain, transport and place making outcome. A stacked multimodal transport interchange at Westmead, provides an opportunity to relieve the traffic bottleneck currently created by the existing bridge infrastructure at Westmead, starts the process of upgrading an aged heavy rail station, and addresses the safety, accessibility and mobility concerns by offering vertical connection via a lift between transport modes. This solution would result in an effortless, cohesive and functional interchange that meets the future needs of Westmead and provides an opportunity to further consider light rail extensions south, and better interchange with other modes such as the T-way and any future Sydney Metro West.

Option 2 - Westmead Light Rail Terminus - Alexandra Parade

A further alternative to the location of the Westmead light rail terminus identified is to position the light rail terminus on Alexandra Avenue in parallel with Westmead Train Station. In this location the topography is more accessible and the vacant land within the existing heavy rail corridor can be used to effectively position the light rail terminus. As a result of this arrangement, heavy rail, light rail, the T-Way and any future Sydney Metro West stop could become one clearly defined, accessible, functional and effortless interchange.

Recommendations

R1 That the Applicant relocate the Westmead terminus to ensure:

- An integrated multimodal interchange at Westmead Railway Station;
- Achieve seamless connections between modes (light rail, heavy rail, bus t-way and future metro) which address principles of Universal Access, DDA and BCA compliant;
- Realign with Hawkesbury Road to achieve a central spine through Westmead's central street; and
- Demonstrate a future proof light rail connection south of the railway line.

R2 That the Applicant undertake a whole of street design and streetscape upgrade for Hawkesbury Road that redefines Westmead's main street and prioritises pedestrian movement and amenity which is central to the realisation of Westmead as an Innovation Precinct.

R3 That the Applicant undertake further design work on the three stop locations within Westmead to achieve a strong and consistent streetscape which prioritises pedestrian movement and has a high degree of pedestrian amenity

R4 That the Applicant work with property owners on the eastern side of Hawkesbury Road to achieve a holistic approach to an improved public domain, street trees and planting.

Recommended Conditions of Consent

C1 That the Applicant address the requirements contained in Part 3 – Design Sequences Westmead of Council's Parramatta Light Rail Stage 1 Framework – Volume 1.

2.3 Parramatta North

2.3.1 Introduction

The proposed alignment through Parramatta North continues from Hawkesbury Road Westmead, along part of Hainsworth Street along Bridge Road across the Parramatta River along Factory Street through NSW Government lands known as the Parramatta North Urban Transformation Precinct (PNUT) and on to Church Street.

The PNUT Precinct largely comprises the Cumberland East Hospital Campus and former Norma Parker/Kamballa Centre (in addition to a number of other NSW Government sites). The precinct was subject to a State Significant rezoning in November 2014, whereby the (then) Minister for Planning amended the *Parramatta Local Environmental Plan 2011* to facilitate a mixed use development. Renewal of the precinct is largely being overseen by UrbanGrowth NSW (UGNSW). Delivery of the development is expected to be implemented over a ten-year period, creating 2,800 new homes and 1,000 jobs, including a new village centre at Factory Street where a proposed light rail stop is to be located.

In August 2017, Council adopted a new precinct specific Development Control Plan (DCP) which provides detailed development controls, including indicative site layout, building design and setbacks, active transport and road networks, and consideration of significant biodiversity, landscape and heritage. The DCP identifies the Light Rail route and stop through the Cumberland East Hospital Campus, as outlined in the EIS, that is the route via Factory Street and connecting to Bridge Road.

The Cumberland East Hospital site is listed on the State Heritage Register and an endorsed Parramatta North Historic Sites Conservation Management Plan applies to the management of these sites. A portion of the site known as the Former Female Factory and Kamballa/Norma Parker Centre, is currently before the Commonwealth Minister for Environment for a decision to include that place on the National Heritage List. A decision on this listing by the Minister could be made as soon as November 2017, however under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Minister may defer the decision for up to 5 years.

UGNSW has lodged a development application (DA) (ref DA/1124/2017) with Council, which is currently under assessment. Generally, the DA seeks approval for subdivision of the site to create future development lots, open space and roads, plus the delivery of those roads and open space, removal of some trees and demolition of buildings. The current DA reflects the light rail proposed alignment presented in the EIS.

2.3.2 Alignment Analysis

Council raises the following concerns with the impact of the proposed alignment:

- The alignment cuts Hainsworth Street in two and does not realise an important opportunity to visually and symbolically extend into Parramatta Park;
- The alignment fails to service Parramatta Park, a key recreational asset and parkland of world heritage significance;
- An alignment on Bridge Road means that a stop cannot be provided to service the Cumberland West precinct (and any future redevelopment) due to its close proximity to the Children's Hospital stop;
- The Bridge Road alignment results in property impacts and a streetscape formed by 'leftover' spaces;
- Duplication of the bridge over the River, with the unknown long term use and ownership of the existing NSW Health bridge to the north. (It is noted that NSW Health only need access for as long as they operate facilities in PNUT);
- Consideration should be given to the widening of the existing Bridge to reduce visual and landscape impacts;
- The removal of the significant large cluster of fig trees at the corner of Bridge Road and Warrinya Avenue. These trees are a landmark and contribute to the historic significance of the site;
- Lack of clarity of the delivery and connectivity of active transport, particularly cycling paths through the corridor;
- The geometry of the proposed alignment through the Parramatta North Historic Site has a clumsy geometry which is at odds to the orthogonal nature of built form and has irrecoverable impacts to movement, access, use of open space, the future public domain and built form structure which have not been fully considered;
- The Conservation Management Plan for the precinct recommends reuse of the existing path and street network wherever possible to reduce impacts;
- The light rail alignment will structurally shape the future use of the site, its redevelopment and its experience by many users.
- The ability to integrate historic, existing and future requirements to achieve a coordinated outcome for the site has not been demonstrated. The current design does not enhance the heritage context, improve historic connections or contribute a new layer of meaning to this important precinct; and
- Potential for high visual impact on the historic setting through use of fencing and signalised crossings.

The proposed alignment offers a stop location at the proposed town centre at the intersection of Factory/Fleet Street and New Streets. A stop in this location is supported as part of a pedestrianised urban plaza with wide pedestrian paths, finishing flush with stop platforms. This provides opportunity for an active village centre with outdoor dining around the light rail stop.

In relation to the proposed alignment and consideration of the heritage significance of the precinct, Council requests that the route through PNUT be designed as follows:

- Wire free light rail;
- Vegetated tracks from Warrinya Avenue to Green Up Drive;
- Factory Street as a light rail and pedestrian zone only;
- 'Light touch' light rail stop, with specific design relating to the historic context;
- Avoid or reduce the need for signalised traffic crossings;
- Use of landscaping as barriers (over fencing and bollards);
- Delivery of regional connections for pedestrians and cyclists over the River and through the site; and
- Collaboration with NSW Health to develop options to reuse the existing bridge for active transport.

Therefore, Council recommends that the Light Rai route through and Stop at PNUT must not be designed identical with the other network, instead have significant regard for heritage context and place. Refer to Section 4 of this Submission in relation to design detail.

It is noted that ultimately Council will become the long term owners of the open space, roads and public domain. As such, Council has a strong view on the design of the interface of those elements with the Light Rail corridor.

Due to the precincts heritage significance and current and past uses, the community has an active interest in planning for its future. Therefore, any opportunities for the Applicant to actively engage with the broader community in the design of the light rail route though the site would be welcome by Council. This may include, but not limited to, naming of light rail stop, heritage interpretation and plans for the overall design.

2.3.3 Alignment and Stop Issues

As outlined in Appendix B, Council believes that an alternative alignment should be reviewed by the Applicant in collaboration with DPE and Council between Hainsworth Street and Factory St, specifically:

- Continue the light rail along the full extent of Hainsworth Street;
- Create an additional stop at Parramatta Park;
- Crossing the Parramatta River further south at River Road; and
- Continue straight along River Road onto Factory Street.

This alignment is preferred as it responds with sensitivity to the historic built form, axial structure and heritage landscape character of the precinct, is more direct and enables a light rail stop, access and connections to Parramatta Park.

Parramatta Park is of regional significance to the City of Parramatta and surrounding district. The historic parklands at the north eastern end are currently underutilised and poorly connected to Westmead and Parramatta North. A direct alignment which services Parramatta Park provides an opportunity to upgrade a back of house corner of the Park, create a strong and legible new address which clearly delineates the Park from the Cumberland West precinct. An additional benefit of this light rail alignment is that it enables Glengariff House and Wisteria Gardens to become encompassed within the boundaries of the historic parklands. This alternate alignment also avoids the World Heritage Buffer Zone by skirting its edge.

A new light rail stop, sensitively placed along this new edge will service as a new welcoming entry into Parramatta Park, Glengariff House, Wisteria Gardens, the People's Loop, the Western Sydney Stadium precinct and potential future development to the north.

A new bridge connection across the Parramatta River could potentially demarcate historic cultural landscapes from sustainable riparian landscapes. It also serves as an additional access point to the riverfront. Consequently, this alignment serves to protect the significant cluster of fig trees likely to be removed by the base case alignment. It is however noted that a bridge in this location will be longer and require a sensitive approach to minimise disturbance to ecological communities.

A light rail alignment along River Road can be delivered with sensitivity to the historic built form and archaeology of the adjacent Former Female Factory. An alignment here reduces the impacts to the curved framework of Eastern Circuit and potentially reduces the requirement for barriers. Customers will also be able to experience close up views of the historic urban fabric from a light rail vehicle. Most importantly, a light rail alignment along River Road will follow a historic alignment and express the historic development and structure of the historic core.

Council acknowledges that any alignment change would have potential ecological and heritage impacts and these would be required to be addressed as part of the assessment.

These impacts include the potential need for referrals to the Commonwealth under the *Environment Protection and Biodiversity Conservation Act 1999* in relation to the Grey Head Flying Fox colony and proximity to the National and World heritage listed buffer to Old Government House and Domain at Parramatta Park. This would also apply if the National listing was successfully determined by the Commonwealth for the Former Female Factory site and Kamballa/Norma Parker Centre. Council has sought preliminary advice from the Commonwealth in relation to the alternate alignment and its impact on any current and future World and National Heritage Listing. Once received, it will be shared with DPE and the Applicant.

In addition, consideration of any alignment changes would be required on the impact on State heritage listings and State listed ecological species and impacts upon the relocation of existing operational NSW Health facilities.

Furthermore, there would be amendments required to the current development application before Council (ref DA/1124/2016) from UrbanGrowth NSW. Potential changes would include the proposed subdivision of lots, pedestrian and cycleway, roads and utilities.

Council accepts that the full assessment of the above impacts may prove that it is not a viable alternative alignment, however based on the preliminary analysis that Council has undertaken and further information that the Applicant may hold, such as the outcomes of recently completed investigations of historic and Aboriginal archaeology, it is considered worth understanding the full impacts of both the base and alternate alignment.

Recommendation

R5 The Applicant, in collaboration with Council and DPE, is to undertake detailed investigation of the alternate alignment from Westmead to Parramatta North (as detailed in Appendix B) to understand benefits and impacts relative to the proposed alignment presented in the EIS.

Recommended Conditions of Consent

C2 That the Applicant address the requirements contained in Part 3 – Design Sequences Westmead of Council's Parramatta Light Rail Stage 1 Framework – Volume 1.

Refer to Conditions in Section 4 of the Submission relating to Parramatta North and the design of key streets and light rail stops, pedestrian permeability, vegetated tracks and wire-free.

2.4 Parramatta CBD (Church St North to Harris St)

2.4.1 Introduction

Parramatta is recognised as Sydney's Central City across the strategic planning framework for Greater Sydney. It will rise to this challenge of growth through a suite of public domain upgrades, innovative planning strategies, and transformational investment. It will integrate city-shaping projects into the historic and contemporary life of the city, ensuring that the Parramatta CBD remains functional, accessible and lively in the long-term.

An integrated, multi-modal transport system is an essential component of the Parramatta CBD's future. Light Rail is an important component of a system that will include metro, heavy rail, bus, ferry, an extensive regional active transport network, and legible and comfortable streets, squares and open spaces that will effortlessly connect people between transport modes.

To facilitate the expected growth and effectively manage changes in the Parramatta CBD, Council has prepared a Planning Proposal to amend the planning controls contained in Parramatta Local Environmental Plan 2011 (PLEP 2011). The main aim of the Parramatta CBD Planning Proposal is to provide for an expanded and more intense commercial core, supported by dynamic, higher-density mixed-use areas. The amended planning controls are expected to provide capacity for an additional 49,000 jobs and 20,000 dwellings to 2056.

The expected increase in demand for public transport from additional residents, workers and visitors requires an integrated transport network solution for the Greater Parramatta area. Light Rail - together with other transport network improvements, such as Sydney Metro West - will support this growth and respond to the growing travel demands to, from and within the Parramatta CBD.

While the EIS considers potential growth from some DAs and significant renewal areas, it does not account holistically for the growth proposed under the draft Parramatta CBD Planning Proposal, as well as the nearly 30 site-specific Planning Proposals located in the Parramatta CBD. Such growth has implications for the Light Rail in terms of usage, traffic, and construction impacts. EIS modelling must take into account aggregate potential growth, demand for transport infrastructure, and cumulative traffic and construction impacts - particularly within the Parramatta CBD. Please refer to discussion and recommendations relating to this point in Chapter 3 of this Submission.

2.4.2 Parramatta CBD – Proposed Alignment Analysis

Church Street North

With the introduction of Light Rail, Church Street North will become a future growth corridor and northern entry into the Parramatta CBD for residents, visitors and workers. As one of the City's oldest and most historic streets, it has always been a significant transit corridor and north-south spine. As the Parramatta CBD continues to grow and extend to the north, the clarity of this central spine will become increasingly important. Considering a logical placement of stops to integrate with a future extension to the north along Church Street is important to make sense of Church Street as a continuous streetscape; this may involve considering how the proposed Fennell Street stop integrates with buses.

The Applicant should consider the design of Church Street north to ensure the following:

- Where possible, avoid heritage impacts to St Patricks Church, the Royal Oak Hotel and Prince Alfred Square;
- Demonstrate how bus interchange is to occur from bus routes on Dunlop Street, Pennant Hills Road and Church Street onto nearest light rail stop;
- Identify where buses will travel to inform whole of street design outcomes
- Ensure pedestrian refuge islands are provided within the design so pedestrians can cross the road at a minimum of each/every intersection.

These design issues are further detailed in The Urban Design Framework and Technical Requirements (Appendix B and C).

Church Street (CBD)

As a renowned local street anchored by two public squares, Light Rail will support the continuing function of Church Street as a key place of orientation in the City. The northern extent of Church Street is anchored by Prince Alfred Square, which will continue to evolve as a principal event destination and everyday park, united with the new Riverside Theatres. The southern extent of Church Street (CBD) is anchored by Centenary Square, which will continue to function as the City's lounge room, with its character and pedestrian-orientation extending north into Eat Street. Connecting these two squares, Eat Street will form the main spine of Church Street (CBD) and will continue to be a renowned destination. It is important that the whole of Church Street is considered in detailed design of the Light Rail Project, due to its distinct, low-rise local character and unique cluster of outdoor dining uses.

Section 5 of the Submission details the likely adverse impact on businesses during construction of the Project, in particular businesses along Church Street known as Eat Street. Council recommends a series of mitigation measures to reduce the economic impacts during construction on this area.

Macquarie Street

Light Rail will connect the Parramatta CBD to its region, centring on a major multimodal interchange in the heart of the Parramatta CBD at Parramatta Square. The Parramatta CBD has a compact core, constrained by the river to the north and parklands to the east and west, and depending on only two east-west connectors through the City: George and Macquarie Streets. As a result, significant pressure is placed on these streets, and any modifications to either street must consider the flow-on effects to the other. Please see further discussion of Council concerns regarding the Macquarie Street alignment below.

2.4.3 Alignment and Stop Issues

Council has concerns about stop arrangements along Church Street, particularly in relation to pedestrian flows and urban design outcomes at Eat Street. Council presents below four opportunities for investigation of alternate stop locations along Church Street which could help to resolve these issues. Following that, Council's concerns with the Macquarie Street alignment and requested relocation of the Parramatta Square stop are also discussed.

Church Street North stop location

Council recommends further work on the stop location currently placed at Fennell Street to improve the legibility and connectivity of the city network and offer a significant place-making opportunity to integrate a number of transport modes with the urban fabric and significant mature tree canopy.

Lennox Bridge split stop

Council believes there is an opportunity to explore a split stop option on either end of Lennox Bridge, in place of both the Prince Alfred Square stop and the stop just north of George Street. Splitting a stop at this location promotes the historic significance of the bridge as a connection over the Parramatta River, provides a consistent place-making link between the river's northern and southern edge and could improve the traffic network immediately north of Market Street, which may be closed as part of the Riverside Theatres redevelopment. This adjustment could also alleviate the safety, access, amenity planning and maintenance constraints and outdoor dining issues created by the stop just north of George Street.

Riverside Theatres stop location

Relocating the Light Rail stop from Prince Alfred Square to the front of Riverside Theatres would directly connect the Theatres to the broader multimodal transport network, and improve access to the north side of the Parramatta River. A stop in this location could also improve the traffic network immediately north of Market Street, which may be closed as part of the Riverside Theatres redevelopment. A stop at Riverside Theatres would become a destination of cultural significance in the Light Rail network, and form a physical and visual link to the Lennox Bridge, Parramatta River and the cultural precinct. It would also serve patrons of the Western Sydney Stadium along the Parramatta River.

George Street split stop

The Church Street stop just north of the George Street intersection presents the City with a number of issues that are yet to be resolved including drainage, safe and accessible flow of pedestrians, arrangement of outdoor dining, provision of large-scale tree canopies, access for maintenance and the extent of barriers. An alternative option that may alleviate many of these issues would involve a split stop on either side of the George Street intersection.

Macquarie Street Alignment

Council has the following concerns with the proposed alignment on Macquarie Street between Church and Harris Streets:

- The alignment results in disjointed, local access to Macquarie Street which impacts on the overall legibility and functionality of the Parramatta CBD street network north of the railway;
- The alignment constrains overall east-west vehicular access and movement in the Parramatta CBD to a single street (George Street), contradicting Council's vision for George Street as an activated, pedestrian-oriented street that celebrates its historic significance and importance to the City;
- The proposed stop location is not visually connected to the Parramatta heavy rail station;
- The alignment has an unresolved relationship with the proposed Metro in regards to modal interchange and pedestrian numbers and flows;
- The alignment does not interchange effectively with the ferry (a major tourist attraction and historic point of arrival into Parramatta);
- Both Macquarie Street stops have limited pedestrian amenity, deviations to built form alignment and poor public domain interfaces on Macquarie Street
- The Parramatta Square stop impacts on the Civic Link and access to Parramatta Square
- The alignment precludes realisation of the Parramatta CBD cycle network on George Street, placing additional pressure on the river foreshore to accommodate commuting cyclists.

Parramatta Square (Macquarie Street) Stop

The current proposed location of the Parramatta Square stop is unacceptable. Council requests that the Parramatta Square stop is relocated west of Civic Link, to improve sight lines, provide unencumbered pedestrian access to the Civic Link, increase pedestrian capacity in this area,

and maintain vehicle access to Parramatta Square. Pedestrian priority across Macquarie Street at this point is essential, and the proposed stop location east of Civic Link will provide insufficient pedestrian capacity.

Recommendations

R6 That the Applicant refine the design of Church Street North to achieve:

- A consistent street profile and character which builds from key elements within the existing streetscape
- A continuous light rail alignment with vegetated tracks which strengthens legibility of the streetscape
- Reduced property impacts to key sites including St. Patrick's Cemetery, the Royal Oak Hotel and Prince Alfred Square
- Reduced tree impacts, planting new trees wherever possible and training existing mature eucalyptus
- Stop placements which consider future northern extensions and draw on existing place-based qualities and historical references
- A clear delineation between light rail, local traffic and bus corridors
- Provision of efficient and effortless bus interchanges at Parramatta North
- Pedestrian permeability at least equal to the existing streetscape with direct crossings protected by refuge islands (without staggers or deviation) at each street intersection and pedestrian medians where required.
- A public domain response which responds to historic places and has deference to heritage surrounds
- Design public domain and surrounds of Prince Alfred Square to visually extend, clarify and define the historic square

R7 That the Applicant refine the design of the stop and alignment beside Prince Alfred Square to achieve:

- Seamless integration with the existing geometry and features of the square, addressing the functions of this significant civic place
- A high-quality public domain upgrade which enhances and extends the character of the square
- A light rail alignment which is subservient to existing place-based qualities
- Traffic movement which responds to local access requirements and is compatible with the potential closure of Market Street in order to facilitate the redevelopment of Riverside Theatres upgrade
- A high degree of pedestrian amenity which responds to daily use and events, particularly related to Western Sydney Stadium, the Riverside Theatres and the ANZAC Monument
- A visually decluttered environment which minimises new infrastructure, is wire-free, barrier-free, and generally subservient to the prevailing heritage context
- Unimpeded pedestrian flows free from urban barriers or blockages

R8 That the Applicant refine the alignment design at Lennox Bridge to achieve:

- A visually decluttered environment which minimises new infrastructure, is wire-free, barrier-free seamlessly integrates new and existing materials and finishes and is generally subservient to the prevailing heritage context
- Test options for splitting the Lennox Bridge stop in place of both the Prince Alfred Square stop and stop just north of George Street

- Flush finishes with high-quality natural materials that echo Lennox Bridge and Church Street's heritage identity
- Accessibility to the River Foreshore and connections to the future Museum of Applied Arts and Sciences and Parramatta Ferry Wharf

R9 That the Applicant refine the design at Church Street (CBD) to achieve:

- A consistent and continuous high-quality street profile which provides an integrated solution considering both urban functions (i.e. outdoor dining), safety, principles of Universal Access, DDA and BCA requirements
- Test options for splitting the Church Street stop platforms either side of George Street to reduce impacts and improve street activation
- Weather protection for pedestrians
- Trees to improve microclimate
- A visually decluttered environment which minimises new infrastructure, is wire-free, barrier-free and is generally subservient to the prevailing heritage context
- Flush finishes which integrate seamlessly across the streetscape
- Carefully considered drainage and regarding work which does not adversely impact on existing floor levels and finishes
- An overall design which is mindful of significant pedestrian flows and does not impede these with urban barriers or blockages
- A stop shelter design fully integrated into existing awnings
- Stop kit/infrastructure fully integrated into existing built form to declutter footpaths
- Due consideration for the existing overall architectural character of the streetscape, including awnings.

R10 The Applicant must demonstrate that the impacts to the Parramatta CBD created by the alignment on Macquarie Street will be acceptable, including:

- Providing modelling which demonstrates that the Parramatta CBD north of the heavy rail line can function effectively with one east-west street in daily, event and emergency modes
- Resolving the location of the Parramatta CBD Metro station, anticipated patronage and interchange demand to inform alignment and stop options in order to demonstrate a satisfactory interface with the Light Rail alignment and stop location on Macquarie Street and existing heavy rail station;
- Design a consistent and legible streetscape for Macquarie Street which ensures universal access, enhances east-west pedestrian connections and permeability with high-quality materials, provides strong identity and supports the Parramatta CBD growth with a high-quality urban space
- Moving the Parramatta Square stop west of the Civic Link to ensure clear and unencumbered pedestrian access along the Civic Link and the provision of a clear sight line to the Railway Station
- Providing for unencumbered vehicle access to Parramatta Square during the construction and operation of Light Rail
- Investigating a shared zone along Macquarie Street between Church Street and Horwood Place to improve legibility and consistency of streetscape
- Conducting further design work to resolve the major pedestrian desire line to Centenary Square
- Maintaining the George Street series of pocket plazas and forecourts with planting and large buildings set back from the street; these are to linked through a detailed public domain design that addresses levels materials and planting species

- Minimising impacts of the functions of the public domain including outdoor dining and event systems during construction and operation of Light Rail
- Demonstrating that any resulting impacts to George Street and the Parramatta CBD cycle network are acceptable to Council.

Recommended Conditions of Consent

C3 That the Applicant address the requirements contained in Part 3 – Design Sequences: Church Street North, Church Street CBD and Macquarie Street CBD of Council's Parramatta Light Rail Stage 1 Framework – Volume 1.

C4 That the Parramatta Square stop is relocated to west of the Civic Link, in consultation with Council.

2.5 Rosehill to Camellia

2.4.1 Introduction

Rosehill

Rosehill is an inner city suburb in close proximity to the eastern edge of the Parramatta CBD and with significant historic and cultural assets such as Robin Thomas Reserve, Queens Wharf Reserve, Hambledon Cottage, Experiment Farm and Elizabeth Farm. Rosehill has a strong connection to the river through both its heritage and the local street network has been influenced by connectivity down to, along and over the Parramatta River. Rosehill precinct faces significant constraints associated with flooding and has resulted in the establishment of many of the parklands and open space assets.

Light Rail must safeguard the open space network, river connections and heritage assets at Rosehill as a priority to support a growing city. This includes establishing Light Rail as a connected landscape boulevard; creating a high amenity parkland interface with all open space and heritage items and ensuring continuity and permeability between Robin Thomas Reserve, Queens Wharf Reserve and the Parramatta River Foreshore.

Camellia

The Camellia Town Centre is a significant urban renewal project expected to make a significant contribution to the population targets planned for Greater Parramatta to Sydney Olympic Park Growth Corridor, with an expected 10,000 new dwellings. Camellia is subject to a Priority Precinct Planning process involving both the DPE and Council to develop a Camellia Town Centre Masterplan. A Camellia Land Use and Infrastructure Strategy was released by DPE for public comment in July 2015 which envisages a mixed use precinct of retail, commercial and community floor space (including a new primary school) to support incoming residents.

Council considers that the EIS does not adequately address SEARS 6. Place Making and Urban Design *"1. The Proponent must identify how functional 'place' outcomes of public benefit will be achieved, including design principles and strategies that (a) give particular consideration to the NSW Government's Priority Precincts and those areas identified for future renewal."*

TfNSW have been involved with the Camellia planning process with DPE and Council and have attended a number of urban design/planning workshops to discuss the implications of Light Rail. These discussions resulted in the identification of the proposed light rail corridor along Grand Avenue in the Land Use and Infrastructure Strategy, with significant urban design work following to develop built form and density controls to inform a future rezoning proposal.

2.4.2 Proposed Alignment Analysis

The proposed alignment extends from Macquarie Street onto Harris Street then onto George Street along the edge of Robin Thomas Reserve. It then continues along George St through to Alfred Street in Rosehill where it changes alignment, runs diagonally through existing private properties and then shifts alignment onto Tramway Avenue. The alignment then follows Tramway Parade and begins to change elevation, crossing and disconnecting traffic access at Arthur Street before crossing James Ruse Drive via an elevated bridge structure to Camellia. At Camellia it follows Grand Avenue North and then joins the existing Sandown Line onto the proposed Stabling and Maintenance Facility located south of Grand Avenue and to the east of the Racecourse.

Robin Thomas Reserve

Robin Thomas Reserve is a very well-used park that services the broader Parramatta CBD, Rosehill and Harris Park communities. It is the only open space within the Parramatta CBD that has active playing fields. These fields are used heavily by organised sporting groups, schools, Parramatta CBD workers and general community alike. Council developed a Master Plan for the Robin Thomas and James Ruse Reserves in 2014 which recognises the need for future investment and upgrades to cater for a growing surrounding population.

Council would like to ensure that any impacts are offset by improvements to the Reserve as part of the Project. The Applicant must ensure an enhanced standard of public open space, amenity and playing fields are provided. As detailed below, Council recommends the preparation of a revised Master Plan for Robin Thomas Reserve by the Applicant in collaboration with Council and in consultation with the community. Implementation of public domain and built works must be funded by the Applicant.

Heritage and archaeology impacts to Robin Thomas Reserve are discussed in Section 9 of this Submission.

Recommended Conditions of Consent

C5 Prior to construction, the Applicant in collaboration with Council prepare a revised Master Plan for Robin Thomas Reserve for the purposes of community consultation. The Master Plan shall:

- Minimise impact on open space;
- Provide playing fields of the equivalent utility and standard to those existing on Robin Thomas Reserve; and
- Protect the existing skate park and water play park.

C6 That the Master Plan should demonstrate that there is an enhanced standard of public open space and amenity within Robin Thomas Reserve and any immediately adjoining public land.

C7 Following community consultation, the Applicant and Council agree on the public domain and built works to be funded by the Applicant. Prior to commencing works, the Applicant shall submit the final Masterplan, with a detailed schedule of works to the Secretary of the Department of Planning and Environment for approval.

Rosehill

Council has concerns in relation to the proposed alignment through Rosehill from George Street (at Purchase Street) to Tramway Avenue. Council believes this section of alignment results in:

- The awkward geometry of the turn requires the Light Rail to impact two street intersections, one of which is an important through connection to the existing industrial precinct and new high density residential development; the other an important active transport connection to the Parramatta River.
- The route has immediate localised impact on a number of private properties. These impacts result in residual land parcels that have limited public domain, local access or amenity value for the precinct being compromised by the track alignment.
- Arthur Street is cut by the elevation of the alignment which has implications on the accessibility of the precinct and the operations of the Alfred Street/Tramway Avenue intersection. This in turn constrains the capacity and structure of the street network and has significant implications for future redevelopment within the Rosehill industrial precinct.
- A lack of address to Queens Wharf Reserve as a significant historic and cultural landmark;
- The complex Alfred Street intersection is located on a regional pedestrian and cycling corridor which connects the south to the Parramatta River and the Parramatta Valley Cycleway. The proposed alignment intersection creates a significant barrier to pedestrian and cycle access by: increasing intersection sizes, reducing travel path options, increasing travel path distances, increasing complexity and wait times associated with vehicle turning movements.
- The complex alignment path for the Rosehill sequence has significant impacts on the public domain, local amenity, circulation, legibility and traffic operations in the area. These impacts will not only influence the future structure and development of the Rosehill precinct but also the light rail operation and passenger experience.

Given the limited benefit and significant impacts, a re-evaluation of the alignment is recommended as described below.

Bridge over James Ruse Drive

The impacts of light rail running on a bridge from Rosehill to Camellia are significant.

Numerous properties fronting onto Tramway Avenue will be impacted by bridge infrastructure which impacts on their visual amenity, redevelopment opportunities, land values, access and movement. The proposal to elevate the light rail will also cut-off Arthur Street and have significant impacts on the local street network. The bridge infrastructure also creates flood impacts which require mitigation through large detention basins, further eroding the streetscape and reducing overall useability and attractiveness. An integrated solution to flood mitigation, open space provision and place-making is required in this location. While the pedestrian and cycle link across James Ruse Drive provided as part of the bridge is supported, there are concerns regarding its length, permeability and possible entrapment issues which need to be addressed.

The elevated crossing of James Ruse Drive results in restricted connectivity to the south of 181 James Ruse Drive reinforcing the isolation of the existing land parcel. The crossing also restricts the option of placing a single stop and clear point of interchange before the line splits. The elevated structure also results in undesirable public domain outcome at the Camellia Town Centre through awkward geometries and creation of new under-croft spaces.

In addition to alignment refinements required through Rosehill, the vertical alignment option proposed for the crossing of James Ruse Drive has significant impacts which require further consideration and refinement. The proposed alignment currently indicates a large bridge structure beginning at the Arthur Street intersection at Rosehill, proceeding over James Ruse

Drive and splitting with part of the bridge landing at the proposed Camellia stop and the other part progressing on to the Sandown Line.

Council recommends that the Applicant, as part of detailed design of the bridge over James Ruse Drive, address the above urban design and property impacts.

Camellia

The EIS indicates a light rail alignment for Camellia along the Sandown route. Council considers that the EIS does not adequately address the SEARs 6 relating to consideration of NSW Government's Priority Precincts and those areas identified for renewal, which includes the Camellia Town centre. Council is committed to a Grand Avenue light rail alignment for significant land use planning reasons, as detailed below.

Treatment of the Sandown Line

The SSI seeks approval for the conversion of part of the Sandown Line to accommodate Light Rail. Council is concerned that the existing ballast and tracks will be used in this section of Light Rail through a future Town Centre. The EIS states that the Light Rail shall "support the evolving urban form of Camellia Town Centre" (Refer Section 4.2).

Council expects a design reflective of Camellia Town Centre and its future uses, including embedded tracks and a fully treated light rail stop. The Sandown Line must reflect the future active and vibrant street address and public address in order to provide an appropriate frontage to new development. Levels and finishes must match those proposed for the new town centre and the design of the street must respond to new streets and include regular crossings suitable for the new town centre. The edge of the new street must be carefully considered to interface with new development and consistent with the Camellia Master Plan, fencing is not an appropriate outcome for this precinct.

Camellia Stabling and Maintenance Facility

The EIS identifies the location of a Stabling and Maintenance Facility along Grand Avenue and Colquhoun Street, east of Rosehill Gardens Racecourse. As the location of the facility will be immediately to the south of the future Camellia Town Centre, Council requests that the design appropriately integrates into the surrounding future town centre and is of high quality.

The proposed stabling yards form a very large development parcel which due to the operation and security requirements of this facility will create a very large urban block and potentially create long sterile edges to the street. To achieve a better design outcome, Council requests that the stabling yard be designed to ensure both Grand Avenue and Colquhoun Street have a public street frontage with street presentation and edge character which responds to future context.

In addition, the current design outlined in the EIS responds to the flood planning level which means the finished ground level will be raised approximately 2 metres above the natural ground level. Council is concerned that this will result in a separation from the street level and poor street presentation, as well as reduced capacity within the floodplain and diverts and worsens flooding. These issues must be addressed through the design of the Facility.

Council cites a positive design example as the Philadelphia Naval Yards Urban Outfitters Production facility which provides engagement from the surrounding public domain.

Recommended Conditions of Consent

C8 The Project must include repurposing the existing Sandown line to embedded tracks and a public domain treatment around the Light Rail Stop. That the treatment is reflective of a

design standard within a new Town Centre setting, consistent with the Camellia Master Plan and undertaken in consultation with DPE and Council.

C9 Prior to the construction of the Camellia Stabling and Maintenance Facility, the Applicant shall prepare a detailed design. The design of the facility must be prepared in conjunction with Council and Department of Planning and Environment to ensure that facility is fully integrated with the Camellia Town Centre Master Plan. The design shall demonstrate how it addresses the following criteria:

- Creation of public streets along Grand Ave and Colquhoun Street that accommodates pedestrians, bicycles, street parking and cars;
- Provision of generous landscape setbacks, with setback secure fence from the boundary and wide footpaths;
- A legible entry for staff and visitors;
- Locating active uses and public entrances along the street with direct access off the street;
- Address principles of CPTED;
- Consider location of open space and community facilities along the Grand Ave with immediate access to the Town Centre; and
- Address the reduction of capacity within the floodplain and diversion flood waters.

Refer to Recommended Condition of Consent in Section 4.3 relating to design detail of the bridge over James Ruse Drive.

2.4.3 Alignment and Stop Options

Noller Parade/Tramway Avenue, Rosehill

Council proposes an alternate alignment which follows a consistent east-west path from George Street across the south-east corner of Queens Wharf Reserve through Noller Parade and Tramway Avenue. Whilst this alignment impacts on Queens Wharf Reserve, it follows the original 1943 tramway alignment connecting through to Grand Avenue.

The benefits of this alignment are:

- straightens the existing alignment whilst also taking advantage of the generous road reserve at Tramway Avenue and aligning with TfNSW current location for the James Ruse Drive Crossing.
- Offers the potential for an expansion of Queens Wharf Reserve and waterfront open space.
- Offers an improved urban structure to support future development within the Rosehill industrial precinct;
- Provides improved outcomes for Alfred Street; and
- Provides a consistent urban outcome and experience along the River.

Similar to the proposed alignment flood constraints will require further investigation and resolution and property acquisitions may be required if shared running cannot be facilitated.

Council acknowledges that there will be some affected properties along Noller Parade as a result of the alterative alignment option, however Council believes these are not dissimilar level of impact to the proposed alignment.

Recommendation

R11 The Applicant modify the light rail alignment to run straight from George Street via Noller/Tramway.

Camellia - Light Rail Alignment

The EIS indicates a light rail alignment for Camellia along the Sandown route. Council considers that the EIS does not adequately address the concerns in relation to the light rail alignment along the Sandown line through Camellia. Council remains committed to the Grand Avenue light rail alignment for significant land use planning reasons, as detailed below.

Serves a greater portion of Camellia's Priority Precinct

A Grand Avenue alignment has the potential to serve not only the future Camellia Town Centre and the Racecourse but also significantly improve accessibility to employment uses to the south of Grand Avenue encouraging their renewal from traditional industrial uses to higher order uses to include new industries such as clean technologies, eco-industries, advanced manufacturing and logistics.

The proposed alignment serves a greater portion of Camellia, including providing a light rail stop that is in closer proximity to the Rosehill Racecourse which is a significant events destination. The proposed light rail alignment along the Sandown Line will result in a station location that is located further north away from the Rosehill Racecourse (approximately 500 metres).

The alignment along Grand Avenue will ensure that the south can benefit from any new public transport and improved services that may continue along the existing heavy railway line from Clyde to Camellia.

Improvement to urban design and development outcomes within the planned Camellia Town Centre

The current alignment will also result in a less efficient use of land on either side of existing Sandown Line when compared with the Grand Avenue alignment which would enable closure of the existing Sandown line to enable larger development blocks and greater development options including location of future active open space.

Currently the Sandown line is 19.4m wide. To enable light rail to utilise the existing rail corridor plus the addition of roads on either side, a total reservation of 27 metres is required. This additional 7.6m along its length translates to an additional area of approximately 4500sqm that would be taken from existing developable lots within the precinct.

The Sandown Line alignment would result in significant residential amenity impacts that is further exacerbated by the 'dead running' of the line through this residential area en route to the Camellia Stabling and Maintenance Facility. A dead running light rail through the middle of a new town centre is not an acceptable outcome for this future urban precinct.

Closing the Sandown Line and converting this to an east west road connection (without light rail) through the precinct would enable greater permeability for both cars and pedestrians as well as enable greater flexibility over how the developable blocks and the street network can be laid out. Furthermore, aligning the Light Rail corridor along Grand Avenue would not only ensure more efficient use of developable lots and improve legibility, this alignment would also allow for more efficient connection to the Carlingford line intersection and access to the stabling yard.

Alternatively, the Grand Avenue alignment would not only bring the line closer to the Facility but may also ensure a more linear route for Stage 2 should the alternative Camellia alignment be adopted.

Impact on future active open space options within the planned Camellia Town Centre

Considering the significant urban renewal planned for Camellia, there is a critical need to provide for the active recreation needs of incoming residents. The current alignment means

future options for locating a suitably size piece of active open space will be compromised. Council and DPE as part of precinct planning process have undertaken site planning which indicates a decrease to open space as a result of the proposed alignment.

Running light rail through the Sandown Line has the effect of reducing future options for active open space within the precinct by effectively splitting the Town Centre into two distinct areas (north and south of the line). Given how the proposed alignment will split the precinct, an appropriately sized parcel of land (accommodating at least two full sized rectangle playing fields (soccer/rugby) with an oval field (cricket/AFL) orientated in a manner that is located within the Town Centre precinct and is also co-located with a future primary school will not be able to be provided.

It is acknowledged that the impact of the Sandown Line route may have cost savings for TfNSW with regards to construction/utility relocation as it utilises an existing rail corridor but this cost will ultimately be shifted to Council who will need to spend funds to upgrade or purchase new open space off-site in order to meet the additional demand generated through the future development of Camellia.

Ease of implementation of Grand Ave

The Grand Avenue alignment can be easily delivered at grade without having to undertake a detailed design of the whole future street structure, including new street structure, crossings, at future levels etc. A Grand Avenue alignment enables Camellia to be more easily and seamlessly developed over time.

Reducing Light Rail conflict with heavy vehicles

The Camellia Master Plan that is currently being prepared by DPE and Council seeks to divert heavy vehicle movements from the precinct via new bridges over Parramatta River and Duck River to reduce heavy vehicle movements on Grand Ave. This will reduce their interaction with Light Rail on Grand Avenue.

Recommendations

R12 That the Light Rail alignment be modified to run along Grand Avenue.

R13 That the Applicant prepare a Cost Benefit Analysis (CBA) in order to better assess the advantages and disadvantage of the proposed base case alignment versus the Grand Avenue alignment. The CBA would need to include the following costs:

- Any land acquisition required;
- Re-routing utilities from Grand Avenue. Noting that Stage 2 will need to factor in utility relocation; and
- Costs implications for redevelopment within the Priority Precinct, including delivery of more efficient development parcels, open space and community infrastructure.

Recommended Conditions of Consent

C10 That the Applicant address the requirements in Council's Parramatta Light Rail Stage 1 Framework – Volume 1 relating to Design Sequences:

- Robin Thomas Reserve to Rosehill; and
- Camellia.

2.6 Rydalmere to Carlingford

2.6.1 Introduction

Council supports adapting the T6 Carlingford Line to Light Rail. The high-frequency service will support the corridor's existing (largely residential) population, connecting people to employment and education opportunities. It will also support growth at the urban renewal precincts at Telopea, in Carlingford, and at the former ADAC site in Rydalmere. Council also supports the proposed 5km Active Transport Link (ATL), and considers that the Light Rail Project offers a unique opportunity to deliver a major and critical regional ATL.

However, the existing heavy rail corridor is currently inward-facing and represents a barrier to connectivity in this precinct. Council believes that the Project's key urban design move in this sequence should be to reorient the corridor to be outward-facing, catalysing redevelopment through improved connections, and integrating seamlessly into the surrounding public domain and neighbourhoods. The ATL should also be separated from general traffic and pedestrians, so that it can cope with significant expected trip demand.

Council considers that the Project would be particularly transformational for Telopea. Council and the Land and Housing Corporation (LAHC) have developed a Master Plan for Telopea which was finalised earlier in 2017, which plans for a mix of social, affordable and private housing within walking distance of transport, better community facilities, parks, shops and infrastructure. A Priority Precinct for Telopea (which is somewhat larger than the Master Plan area) has also been announced. The Project is an important catalyst for transforming Telopea into a vibrant neighbourhood which includes more housing. The new stop integrated with a plaza near the existing rail (as shown in the Telopea Master Plan) will create an arrival point within an active and walkable central hub. More frequent services will significantly improve access to employment and education opportunities within the Parramatta CBD. The Project also presents opportunities for improved active transport connections within Telopea.

2.6.2 Carlingford to Rydalmere - Precinct Analysis

Transformation in this precinct

The Project presents a major opportunity to convert the T6 heavy rail line into a parkway spine, reorienting it to address the corridor and support next generation living opportunities throughout the precinct. This precinct's character will continue to be defined by its terrain, view corridors and bushland creek corridors, which will be enhanced and further connected along the spine. New and improved local connections in the corridor will break down barriers created by infrastructure, supporting community cohesion and future growth through improved access to centres, schools, community facilities and open space. Future regional transit connections to Epping will promote improved access and flexibility for job, study and lifestyle choices. The Project also allows isolated land uses around WSU Rydalmere to be stitched together, redefining the university campus as the point of arrival to this precinct and the river.

Corridor design and new links

The corridor design should achieve a parkland setting which creates new open space and improved public domain. It should function as a multimodal parkway with extensive and well-connected biodiversity corridors (particularly at Vineyard Creek), multiple active transport connections, connections between all modes of transportation which address principles of Universal Access, DDA and BCA compliance, and high-quality public amenities, fitness equipment and fixtures. Significant re-grading works of the corridor are needed to realise these objectives, improve public domain, and facilitate emergency access and ongoing maintenance and operational activities.

In conjunction with the overall ATL strategy (described in the following section), a number of new and future-proofed links with the surrounding neighbourhoods are recommended to improve connectivity. Links should be designed as high-quality public domain (incorporating lighting, paving and landscaping), be at least 6m wide, facilitate emergency and maintenance access, be placed to respond to local context, and be spaced at regular intervals (maximum 180m) to promote permeability and safety. Furthermore, the Project should provide connectivity improvements which are already identified in existing plans for growth precincts. Table 1 contains the recommended new and future-proofed connections.

Table 1: List of recommended connections in the Carlingford to Rydalmere precinct

Connection type	Recommended connection
New street connections, including pedestrian and cycle links	1. Victoria Road, Rydalmere 2. Calder Road to Anderson Avenue, Dundas 3. Sturt Street to Adderton Road, Telopea 4. Thallon Street to Jenkins Road, Carlingford
New pedestrian and cycle links/crossings	1. Thallon Street to Coleman Avenue, Carlingford 2. Submarine Park to Kenny Place, Carlingford 3. The Parade to Adderton Road, Telopea 4. Telopea stop, Robert, Sturt and Shortland Street intersection 5. Narrun Crescent to Adderton Road (to Chestnut Avenue), Telopea 6. ATL link to Leamington Road, Telopea/Dundas 7. ATL link to Denham Place and Kissing Point Road, Dundas 8. Dundas Station, northern link to Kissing Point Road upgrade, Dundas 9. Reserve Street to Rippon Avenue, Rydalmere/Dundas 10. Dudley Street to intersection of Victoria Road/Anderson Avenue, Rydalmere
Future-proofed street connections	1. Anderson Avenue to Dudley Street, Rydalmere 2. Reserve Street to Rippon Avenue, Rydalmere/Dundas 3. Shortland Street to Adderton Road, Telopea 4. Homelands Avenue to Marshall Road, Telopea/Carlingford 5. Tiptrees Avenue to Brand Street, Carlingford
Address existing infrastructure barriers associated with the heavy rail corridor	1. Victoria Road Bridge: improved east-west active transport connection and improved public domain 2. Dundas: northern link between station and Kissing Point Road 3. Adderton Road Bridge: continuous active transport link alongside the Light Rail corridor and under the bridge 4. Telopea Light Rail stop: multiple crossing opportunities (Sturt, Telopea, Robert and Shortland Streets, and Adderton Road) 5. Pennant Hills Road Bridge: north-south link integrated with adjacent gradients and connected to Lloyds Avenue and Tiptrees Lane

In order to achieve increased permeability through the links defined in Table 1, it is appreciated that some property acquisitions may be required to unlock access in the corridor. The proposed alignment states that no residential properties will be required, however, it is recommended property acquisitions are explored to achieve new street crossings, and pedestrian and cycleways.

Carlingford to Camellia Active Transport Link

Council supports the delivery of a key regional cycling and pedestrian link along the Carlingford to Camellia corridor, known as the Active Transport Link (ATL). Council's key design outcomes for the corridor are to:

- establish a parkway throughout the corridor that delivers a high-amenity experience and promotes safety;
- deliver an important regional connection that establishes a consistent and coherent set of shared and separated path treatments along corridor; and
- maximise crossing points for pedestrians and cyclists at all Light Rail stops and designated crossing locations.

The ATL route is a regional corridor (as identified in the NSW Government's Sydney's Cycling Future) and therefore needs to be separated from general traffic and pedestrians. It is also identified in Council's Bike Plan (2017) as separated walking and cycling. The section between Carlingford and Rosehill is part of a regional cycling link with large trip generators (Westmead Hospital and Parramatta CBD to Epping and Macquarie Park/ Macquarie University via Western Sydney University).

The delivery of the entire 5km link will make cycling a viable and attractive mode choice, inducing significant use, and in itself will be a recreational and commuter cycling destination. Cyclists will be travelling longer distances and are therefore more likely to be moving faster. It is also regional walking link and will have significant volumes of local and regional pedestrians, especially near stops and the University. The predicted speeds and volumes of pedestrians and cyclists will exceed the standard for shared paths (Cycling Aspects of AusRoads 2017). In the past year at a flat section near the Carlingford line, the mean cyclist speed has been just over 20km/h and the 85th percentile between 25-30km/h. Taking into account the topography of the Carlingford Line (with a consistent slope down towards the river), a 1-2 decline increases speeds by approximately 5-10km/h. This evidence suggests that 50% or more of cyclists will be travelling around 25-30km/h - well beyond the comfort level of pedestrians and the capacity of a shared path.

In order to address safety concerns and National guidelines, NSW Government and Council cycling policy and guidelines, Council requests, where physical constraints allow, that the ATL be designed as a separated walking and cycling path, and avoid at-grade crossings of local and state roads. Council believes this will future proof the ATL as a key regional cycling and walking link, and address safety issues between pedestrians, cyclists and general traffic.

Council also draws on its experience with the 3m wide shared path along the Parramatta River (the 8.5km long Parramatta Valley Cycleway [PVC]). From recent counts, the peak hour is consistently over 100 cyclists, with approximately 500 cyclists on a weekday and 2,000 cyclists over a weekend. Council is currently awaiting pedestrian numbers, but counts from 12 months ago places the number of pedestrians as roughly half the number of cyclists. Because of the volume of pedestrians and cyclists, there have been increasing complaints about sharing the path with each other, Council is currently retrofitting separate paths along the PVC where the space allows at significant expense. This further underscores the need to design the Rydalmere to Carlingford ATL as a separate path, wherever possible.

Specifically, Council recommends the design of the ATL address the following:

- Along the entire ATL, cyclists and pedestrians should be separated from general traffic. It is recommended the ATL continue under the Adderton Road Bridge and avoid three road crossings, greatly improving the safety of more vulnerable users.
- Where possible, separate cycling and walking paths along the ATL. Shared paths should be provided at a minimum width of 4 metres and preferred width of 5 metres at high pedestrian volume locations. Separated paths should be provided at a minimum width of 3m for bicycles and 2.1m for pedestrians. The track alignment should be adjusted - including regrading wherever possible - to facilitate wider clear widths for the ATL. While it

is noted that the detailed design may vary, it should be consistent with relevant standards for ATLs and be designed in consultation with Council.

- It is recognised that a shared path of 3.6-metre-wide will be provided in the cutting between Adderton Road and Kissing Point Road, Dundas.
- Utilise speed reduction strategies on dedicated cycle paths to indicate change in condition and requirements. Indicative speed reduction strategies include change surface materials or path geometry to indicate shared space approach, regulatory and advisory signage.
- Provide clear sight lines prior to cyclist and pedestrian approach of shared spaces.
- Currently, a new 2.5m wide active transport bridge over the Parramatta River linking Rydalmere and Camellia is proposed. It is not wide enough to cater for pedestrian and cycling shared use. As a comparison, the Bennelong Bridge at Rhodes has a 3.25m wide shared path is very congested at peak times and is already subject to a significant number of complaints. Council would recommend a minimum 4m clear path of travel to cater for pedestrian and cyclists.

Proposed Carlingford terminus

The EIS refers to a "future public plaza to be delivered by City of Parramatta Council" as part of the Carlingford terminus. It is unclear why the EIS mentions a future public plaza for delivery by Council, as it is not identified as a project by Council. Therefore, there is no budget to deliver the plaza. It should be the responsibility of Applicant to deliver if considered as a critical part of the Project.

2.6.3 Alignment and Stop Issues

Future proofing for additional stops and extension

Council recommends that the Applicant undertake further design work to demonstrate future proofing of additional stops and extension to Epping. The Light Rail stops should be located in response to the current and future structure of local centres along the corridor, including at Telopea South and Carlingford South in the future. The Project should also future-proof an extension to Epping via Carlingford Court, including facilitating future duplication of the tracks under Pennant Hills Road (as detailed below).

Pennant Hills Road Bridge

Council has concerns in relation to the proposal to retain a single track along the T6 Carlingford line under Pennant Hills Road at Carlingford. Council believes that it will create a pinch point which could unduly constrain Light Rail operations and service frequency, and limit the ability to upgrade and future-proof the service (e.g. extension to Epping). The single track also does not resolve existing access issues or broader development objectives.

Additional stop at WSU and related issues

Council recommends an additional stop at WSU Rydalmere to support WSU, and to act as a future transport interchange. The stop should be placed with consideration to the Female Orphan School and South Street axis. Adding this stop should also be accompanied by shifting the proposed Rydalmere stop location to the North, under the Victoria Road overpass bridge. This would maintain an appropriate stop placement sequence that responds to local uses, and unlock opportunities to improve active transport, public transport interchange and public domain outcomes at Victoria Road. The addition of the WSU stop is also crucial in unlocking opportunities to future-proof connection to Stage 2 of Parramatta Light Rail running east on South Street, with the new WSU stop serving the future interchange point in an expanded light rail network and potential future ferry wharf.

Recommendations

R14 That the Applicant refine the general scope of the Carlingford Line corridor to achieve:

- an alignment that responds to both existing and future urban structure
- alignment with precinct planning throughout the corridor, including the Telopea Master Plan
- Design and construction of the plaza at Telopea;
- reorientation of the inward-facing corridor to provide a desirable new frontage and public address (e.g. regrading to achieve increased east-west connections, removal of fencing, etc.)
- creating a multimodal parkway characterised by
  - an overall parkland setting
  - connections between all modes which respond to principles of Universal Access, DDA and BCA compliance
  - extensive and well-connected biodiversity plantings
  - public amenities, fitness equipment and other fittings and fixtures which respond to program, including cycling infrastructure

R15 That the Applicant undertake further work in consultation with Council and relevant authorities to refine the following alignment and stop issues in the Rydalmere to Carlingford precinct:

- future-proofing for future extension of the light rail to Epping via Carlingford Court.
- demonstrating to DPE and Council that the retention of a single track at Pennant Hills Road does not compromise the future need for increased service frequencies, nor a proposed extension to Epping, and that the design and land requirements for this future-proofing are included as part of Stage 1.
- future-proofing for future stops at Telopea South and Carlingford South.
- adding a stop at WSU Rydalmere and addressing follow-on requirements of shifting the proposed Rydalmere stop location to the north and future-proofing for interchange with Parramatta Light Rail Stage 2 on South Street.

R16 That the Applicant undertake further work in consultation with Council and relevant authorities to resolve the following issues relating to connectivity in the Rydalmere to Carlingford precinct:

- Investigate delivery and/or future-proofing of the recommended links listed at Table 1 of this submission
- prepare a strategy (with resulting detailed design at construction stage) for the ATL in consultation with and to the satisfaction of the relevant authorities and Council. If the design criteria, as outlined below, are not achieved, the design of the facility shall be submitted to the Secretary for approval accompanied by justification for any changes and evidence of consultation with the aforementioned authorities and Council. The design of the ATL shall be implemented as part of the SSI. The design of the ATL must ensure:
  - maximised safety of pedestrians and cyclists, and separation of all modes wherever possible;
  - identification of urban design principles and standards based on:
    - local environmental and heritage values;
    - urban design context;
    - sustainable design and maintenance;
    - lighting;
    - community amenity;
    - permeability across the corridor, including at dedicated crossings and at light rail stops;

- consideration of relevant design standards such as *Crime Prevention through Environmental Design Principles*;
- future stop locations
- minimising fencing and physical barriers

- provision of appropriate landscaping, including details of existing and retained vegetation, and the proposed removal and proposed landscaping.
- the design of the ATL bridge over the Parramatta River must also:
  - consider relevant design standards such as *Bridge Aesthetics: Design Guidelines to Improve the Appearance of Bridges in NSW (RTA, 2003);*
  - have a width of at least 4 metres;
  - outline specific measures to avoid or minimise heritage impacts to heritage items in the vicinity;
- In meeting the criteria above, the following is provided to the Department to document compliance:
  - graphics such as sections, perspective views and sketches of all conditions from various viewpoints;
  - plans outlining design details of materials, colours and structures;
  - how relevant design standards and key State and Local policies have been considered and responded to in the design;
  - evidence of consultation in relation to the design of the facility.

R17 That the Applicant undertake the following work relating to Rydalmere:

- Investigate moving the Parramatta River active transport bridge element to the Eastern side of the bridge, and undertake refined design of the link between the bridge to the riverbank walk below
- Retention of heritage abutments to Parramatta River Bridge (as discussed in Section 9 of the Submission)
- In conjunction with the additional stop at WSU Rydalmere, establish a continuous north-south pedestrian link between the two Rydalmere stops, providing a western boundary and new point of orientation for the WSU Rydalmere campus characterised by mature trees.

R18 That the Applicant consult with Council in relation to the design, funding and delivery of the proposed Carlingford terminus plaza.

Recommended Conditions of Consent

C11 That the Applicant address the requirements contained in Part 3 – Design Sequences: Camellia to Rydalmere and Rydalmere to Carlingford of Council's Parramatta Light Rail Stage 1 Framework – Volume 1.

C12 That prior to commencement of construction the Applicant demonstrates to the satisfaction of Council that WSU Library, Early Years' Service and Events Management, as well as Carlingford West Preschool, Scouts NSW, City of Parramatta Library and Childcare Management, has been communicated the construction schedule and have determined to their reasonable satisfaction mitigation strategies to enable them to continue their key services either on site or off site.

Please note: additional recommended conditions of consent are likely to arise from work carried out in relation to the Recommendations outlined above.

3.0 Traffic, Transport and Access

3.1 Introduction

An analysis of the traffic, transport and access aspects of the EIS has been undertaken by Council. Council recognises that many of the impacts raised can be considered and addressed at latter stages of the project, for example management of traffic during construction. However, Council requests the following key issues should be addressed prior to approval of the EIS:

- Update the traffic model with revised inputs;
- Undertake further testing and assessment of the impact of intersection delays on the network and present further mitigation measures; and
- Preparation of a draft Greater Parramatta Access Plan which determines the most appropriate mitigation measures to manage the impacts of significant traffic changes (particularly in Westmead and the Parramatta CBD) as a result of the construction and operation of the project.

These aspects, including impacts on traffic, parking, public transport services and access are detailed below.

3.2 Traffic Impacts

3.2.1 Traffic Modelling

The general approach to the traffic modelling, including the constraints regarding the development of the model, are generally understood and appreciated by Council. However, Council believes that the refinement of the traffic model is required so to better reflect current and future conditions.

Council is concerned in relation to the negative impacts on traffic flow resulting from the partial closure of Church Street and Macquarie Street to traffic. For example, there are expected increased delays at the George Street/Smith Street intersection. However, the traffic modelling in the EIS shows a reduction in delays resulting from the project in the afternoon peak in 2026 from an average delay of 42 seconds per vehicle to 36 seconds.

The Project nominates key mitigation measures including encouraging travel at a different time, encouraging travel via a different route, choosing to travel by non-car modes and choosing not to travel. Such measures have a place in the transport planning, such as managing growth and development. However, in this context they appear to be nominated because of the extreme traffic queueing that is partially caused by the Light Rail Project (refer detail below).

The modelling in the EIS does not include local residential streets such as Sorrell Street and Isabella Street which are likely to receive increased traffic volumes detouring away from congestion resulting from the Project. It also does not include the intersection of Phillip Street and Marsden Street.

The EIS does not present the assessment which separately model the travel times for buses. This is important as it will assist in understanding the impact on services, particularly services entering the Parramatta CBD from the north. Council is concerned that the impact will be significant on these services (as detailed below).

Note that Council is also proposing to close Horwood Place on both sides of George Street as part of the Civic Link (refer Civic Link Framework Plan 2017). The model should also include this closure.

The model assumes various traffic upgrade works on key intersections surrounding the Parramatta CBD including grade separation for the intersection of James Ruse Drive/Grand Avenue/Hassall Street. This project should have the effect of removing some of the traffic from the Parramatta CBD. However, it is understood that there is no current commitment by the RMS to undertake this project. Accordingly, it should be removed from the model and the effect on traffic flows remodelled.

The model only extends to 2026. Council is currently undertaking planning for the Parramatta CBD that extends well beyond this. Areas such as Westmead and Parramatta North are known to have significant development in the pipeline beyond 2026. Modelling should also be presented for this timeframe.

Traffic Queuing

The traffic modelling indicates queues at several key intersections that are of concern, particularly on the north western section of the Inner Ring Road. Listed below are the 95th percentile queue lengths (for the worst leg of the intersection) in 2026 for intersections along the north western section of the Inner Ring Road:

- 928 metres (AM) and 1378 metres (PM) at the intersection of O'Connell Street and George Street (358 metres (AM) and 311 metres (PM) without the project).
- 280 metres (AM) and 1598 metres (PM) at the intersection of O'Connell Street and Macquarie Street is indicated (compared to 168 metres (AM) and 439 metres (PM) without the project).
- 938 metres (AM) and 710 (PM) at the intersection of O'Connell Street and Victoria Road (309 metres (AM) and 680 metres (PM) without the project, however, some of the mitigation works would be undertaken without the project so these queues may be less than presented).
- 227 metres (AM) and 759 metres (PM) at the intersection of Victoria Road and Marist Place/Villiers Street (122 metres (AM) and 244 metres (PM) without the project).

The Project is likely to result in a significant deterioration in traffic conditions within the Parramatta CBD. It is also noted that further mitigation measures are being investigated for some of these intersections, however, as noted, some of these mitigation measures have adverse impacts, such as pedestrian delays, local access, network legibility and loss of parking. Therefore, Council recommends that the network effects of these intersection delays should be assessed and further mitigation measures presented in order to reduce delays. Additionally, the impacts of mitigations such as increased travel distances and decreased legibility of the network should be assessed and mitigations proposed.

The intrinsic constraints to the road network resulting from CBD road closures can be demonstrated by giving an example of an individual intersection. The intersection of Smith Street and George Street would have increased delays for the following reasons:

- There would be more traffic on Smith Street because traffic would be diverted from Church Street due to its partial closure to traffic.
- There would be a similar amount of eastbound traffic in George Street, but the number of eastbound lanes approaching the intersection would be reduced from 4 to 2.
- There would be additional phases introduced to allow for westbound traffic, plus the right turn for traffic approaching from the north (although this turn may have a part time ban).
- To partially mitigate against this the scramble pedestrian crossing would be replaced by a traditional pedestrian crossing arrangement. This means that pedestrians making a diagonal crossing would need to cross signalised legs of the intersection twice. There would also be a reduction in safety as traffic would filter through the pedestrians.

- Note that this intersection is effected by the large number of buses that set down in the southbound kerbside general traffic lane either side of the intersection. With a right turn for southbound traffic proposed, through and left turning traffic will be concentrated in the kerbside lane. The EIS does not give any details of if or how these bus stops have been modelled.

Proposed 'Off Corridor' Road Network Changes

In addition to the road and traffic changes identified along the Project corridor a series of additional modifications are required to manage the operation of the road network as a result of the Project (as outlined in Section 5.8.2 of the EIS). Within the Parramatta CBD, these upgrades are intended to facilitate the shift of traffic from Church Street (north) to O'Connell Street. Council has concerns that the proposed network changes in the Parramatta CBD have substantial adverse impacts, including the following:

- Additional loss of on-street parking in George Street;
- Narrowing the footpath in Marsden Street;
- Traffic impacts as a result of closure of Macquarie St to traffic and George Street becoming a two-way street.
- Removal of the pedestrian phase on the southern leg of the intersection of George Street and O'Connell Street. (This leg was installed approximately 3 years ago at approximately $1.6m to overcome a pedestrian safety and access issue associated with events at Parramatta Park); and
- Turn bans that would reduce legibility, effect ease of local access and increase travel distances.

George Street

Council is concerned in relation to impacts arising from George Street becoming a two-way street, including reduced pedestrian safety, removal of on-street parking, property access and not providing on-street bike lanes.

Currently, George Street is relatively easy for pedestrians to cross mid-block because traffic arrives in platoons, in one direction only, with large gaps in the traffic. It is noted that George St has a positive pedestrian collision history, within only 1 collision involving a pedestrian crossing that was not at traffic signals. As a two-way street, crossing will become more difficult and Council is concerned an increase in pedestrian accidents may result. It is acknowledged that speeds would be reduced which would offset some of the difficulty in crossing. The scramble crossing at the intersection of George Street and Smith Street is proposed to be replaced with a traditional crossing, which is likely to result in safety issues and some pedestrian movements to take longer.

Currently, the intersection of Horwood Place and George Street is relatively easy to negotiate for pedestrians, however, with George Street as a two-way street it will become more difficult. Consideration should be given by the Applicant to signalise this intersection, although this creates further issues in regards to the proximity to the intersection of George Street with Smith Street and the likelihood of queues extending back through the adjacent intersections. In addition, the signalisation of this intersection would require future proofing for the delivery of the Civic Link (refer Civic Link Framework Plan).

There are currently several driveways near intersections and as a 1-way street this operates satisfactorily. As a 2-way street, if motorists are allowed to turn right into and out of these driveways it will affect traffic flow and safety. However, it is currently not legally possible to restrict the right turns except by the use of a median island. If a median island is introduced it

can be expected that pedestrians would use it as a pedestrian refuge island, therefore it needs to either be wide enough to accommodate pedestrians or designed to restrict pedestrian use.

In addition, Council seeks clarity as to the impacts on on-street parking and provision of new/improved on-street bicycle lanes along George Street.

Recommendations

R19 That the Applicant undertake revised traffic modelling which includes the following inputs:

- Buses as a separate vehicle type (as opposed to general vehicle class);
- Include impacted surrounding streets - Isabella, Sorrell, Caste and Macarthur Streets, Horwood Place and the intersection of Marsden and Phillip Streets;
- Extend the model to 2036 to include projected growth in the Parramatta CBD and Westmead;
- Remove assumptions in relation to grade separation of James Ruse Dr, at Grand Ave / Hassall St;
- Include Parramatta Square and Civic Link.

R20 The Applicant assess the impact of intersection delays in and around the Parramatta CBD on the network, including increased travel distances and decreased legibility of the network. Further mitigation measures should be presented in order to reduce delays.

R21 The preliminary results of the above be presented to DPE and Council for discussion. The final results of the assessment shall be presented in a revised report.

R22 That the Applicant prepare a design for George Street in collaboration with Council.

R23 That the Applicant investigate signalising the intersection of Horwood Place and George Street, with the consideration of the Civic Link Framework Plan.

Recommended Conditions of Consent

C13 That the Applicant the final design for George Street be approved by Council.

C14 That all works associated with the Project that are undertaken on Council roads and land be subject to approval by Council.

3.2.2 Upgrade of Gasworks Bridge (and the Intersection of George and Harris Streets)

Access to the eastern part of the Parramatta CBD from the north east will be limited by a 'No Right Turn' from Harris Street/Macarthur Street into George Street. There is no other proposed right turn into the Parramatta CBD traveling southbound from Macarthur Street until Parkes Street at Station Street. Accordingly, motorists travelling from Victoria Road and Kissing Point Road will need decide a route at the intersection of Victoria Road and Macarthur Street. This is an excessive imposition on the legibility and accessibility of the network.

The results of the traffic modelling show high levels of congestion on the north western part of the Inner Ring Road. This may then result in traffic diverting to other parts of the Inner Ring Road including Gasworks Bridge. The existing Gasworks Bridge has a limited, although currently unknown lifespan. The Project will also limit the options for Council's proposed widening of Gasworks Bridge. The current design allows widening of the bridge on the west side of the existing bridge. This results in a requirement to use part of MacArthur Girls High School and the hotel site on the south west corner of the intersection of George Street and Harris Street. A bridge widening on the west side means that the existing bridge is used for southbound traffic. This means that it is less likely that a right turn into George Street could be provided as part a

bridge widening, because the existing bridge is only 2 lanes wide, whereas a future bridge for southbound traffic could be 3 lanes wide.

As highlighted in Figure 1 below, a widening of Gasworks Bridge will require additional road widening along Harris Street, together with the Light Rail, and therefore will result in a distance of 35.5 metres from the western footpath to the eastern edge of Robin Thomas Reverse. Council has concerns that the widening of Harris Street will result in alienation of the western edge of the Robin Thomas Reserve, the only active playing fields in the Parramatta CBD.

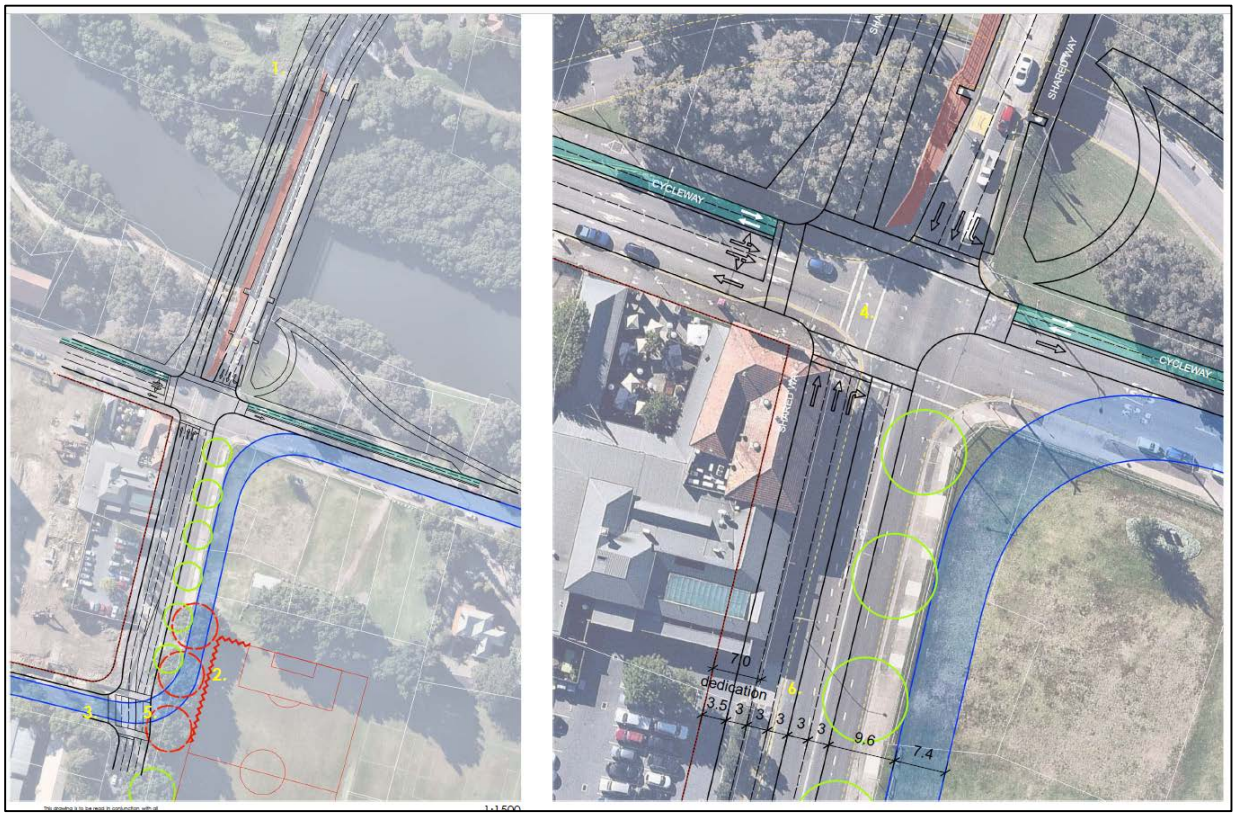

Figure 1: Potential road widening requirements as a result of Gasworks Bridge duplication

Recommendation

R24 That the Applicant prepare a design for the widening of Gasworks Bridge and Harris Street to demonstrate the impacts of the Light Rail alignment along this corridor and a reduced overall corridor width.

3.2.3 Grade Separation James Ruse Drive and Hassall St / Grand Ave

The EIS acknowledges the future delivery of a grade separation at James Ruse Drive at the intersection of Grand Avenue and Hassall Street. The benefits of the grade separation are acknowledged by Council, including supporting traffic for the future Camellia Town Centre. A new light rail bridge is proposed to cross James Ruse Drive and Clay Cliff Creek between Albert Street and Grand Ave North (to the north of the proposed future grade separation). Council believes that the proposed light bridge's height will be required to be increased to ensure the grade separation to be constructed in the future.

Recommended Conditions of Consent

C15 That the Project shall be designed so that the light rail bridge accommodates the potential future grade separation of James Ruse Drive at Hassall St/ Grand Avenue.

3.2.4 Other Traffic Impacts

Telopea

The bus stop location currently proposed during construction requires many pedestrians to cross Robert Street and may restrict sight lines for motorists exiting from Robert Street. One response may be the signalisation of Robert Street and Adderton Road and the existing pedestrian signals be removed. However, this should be considered in light of the DPE Master Plan for Telopea.

Hassall Street

Mitigation item TT-17 in Section13.3.4 of the EIS states that during the detailed design that the Applicant would consider traffic signals at the intersection of Hassall Street and Harris Street. Council is concerned that any proposed traffic signals would significantly increase the volume of traffic in what is primarily a residential street, and this level of detail should be part of the EIS. It is also noted that Local Area Traffic Management measures would also be considered.

Market Street

The light rail relies on Market Street remaining open to provide local access, particularly for general traffic to the Novotel Hotel and for coaches to Riverside Theatres and the Novatel. However, in light of the future redevelopment of Riverside Theatres and the opportunity to connect pedestrian to Prince Alfred Square, Council request that the project not limit the ability for Council to consider closure, or part closure to through traffic of Market Street in the future.

Recommendation

R25 That the Applicant assess the traffic and pedestrian impacts at the intersection of Robert Street and Adderton Road and consider treatment options in consultation with DPE and Council in relation to the Telopea Master Plan.

Recommended Conditions of Consent

C16 That the Project not limit the ability of the redevelopment of Riverside Theatre and the future whole or partial closure of Market Street to through traffic; and

C17 That if traffic signals at Hassall and Harris Streets are provided as part of the Project, that the Applicant prepare and implement associated local traffic measures, subject to approval through the Parramatta Traffic Committee process.

3.2.5 Construction Traffic Impacts

The Construction Traffic and Transport Assessment Report that forms part of the EIS is generally satisfactory. Council is supportive of a Construction Traffic and Transport Management Plan being prepared to appropriately manage the impacts of construction.

Cumulative impacts of construction

It is important to note that the construction phase of the Project is likely to coincide with the construction phase of several redevelopment sites throughout the corridor causing cumulative impacts on traffic and the amenity for local residents. Council has had recent experience with precincts where multiple major construction projects occurred simultaneously, and local residents experiencing short-term construction impacts (e.g. parking from construction workers, noise impacts, etc.) which were exacerbated due to the cumulative impact of numerous developments occurring at the same time. The Telopea Priority Precinct is an example of where such overlap may occur with the Project. Without some form of co-ordination, residents may

experience safety and amenity impacts greater than that identified in the EIS. Accurate information and coordinated planning is needed to ensure cumulative impacts are not significant and are managed appropriately.

Furthermore, several major projects have commenced, or will likely commence construction during the Light Rail Project's construction period, this includes the Western Sydney Stadium and Museum of Applied Arts and Sciences. Western Sydney Stadium will also commence operation in 2019 and will begin hosting regular sporting fixtures and events.

Any Construction Traffic and Transport Management prepared by the Applicant include whole of City strategies for the safe and easy movement of traffic, pedestrians and cyclists across the corridor in relation to large development sites and major events.

Recommended Conditions of Consent

C18 As part of the Community Engagement Plan (as detailed in Section 5 of this Submission) for the Project shall ensure that it consider co-ordination of construction processes to manage cumulative impacts. This should include a strategy to ensure local stakeholders are made aware of the activities on different sites, and how the cumulative impacts are being managed.

C19 That prior to construction, work with Council, relevant state agencies including Venues NSW, the Museum of Applied Arts and Sciences, the Australian Turf Club, NSW Health and Parramatta Park Trust to develop coordinated strategies for the easy and safe movement of traffic, pedestrians and cyclists during construction and events.

C20 The staging plan included with the CMP is to address construction projects within the Parramatta CBD to manage conflicts and develop appropriate strategies.

3.3 Impacts on the Transport Network

3.3.1 Network Access Plan

TfNSW is currently preparing a Greater Parramatta Access Plan (GPAP), the purpose of which is to ensure that Parramatta's transport network operates in an integrated way, and is ready to meet the changing needs of Parramatta in the future. Council is represented both on the Working Group for the GPAP and on the Multi-Agency Steering Group, which oversees its preparation.

The GPAP is expected to identify likely changes to transport over the next five years and outlines the task, actions and infrastructure required to transition to a fully integrated transport network for Parramatta's CBD and nearby precincts. The GPAP should describe the actions necessary to ensure that all transport modes are accessible and integrated as one system. The objectives of the GPAP are to:

- provide for safe and efficient movement of people, goods and services;
- support the creation of attractive and memorable public spaces;
- support business and community during construction of the Light Rail;
- optimise the transport network.

Council feels that the GPAP is a critical part of the process for identifying and mitigating transport issues arising from the Parramatta Light Rail Project. Accordingly, Council considers that the GPAP needs to be considered as part of the assessment process for the Project. The GPAP should include:

- assessing the parking impacts of light rail construction and operation and detailing processes for mitigating lost parking (this can include kerbside management plans, changing rules for remaining parking, and increasing supply of parking away from the impacted areas)
- identifying and assessing expected bus service changes and interchange arrangements both during construction and during operation.
- identifying needed upgrades to legibility and wayfinding for all modes in and around Parramatta CBD.
- identifying and planning for needed road capacity upgrades.
- identifying and planning for needed walking and cycling upgrades.
- identifying future rail provision including Sydney Metro West.
- identifying how above improvements deliver an integrated transport solution, incorporating all modes, to meet the transport needs of all users in the Greater Parramatta area.

Because the GPAP will necessarily address many of the impacts, possible mitigations, and future plans for the transport network arising from the Parramatta Light Rail Stage 1 project, the GPAP should be considered through an open and consultative process. This should include extensive community consultation with opportunity for input and consideration by all transport users in Greater Parramatta.

Recommendation

R26 Before Approval of the SSI, the Applicant prepare the Greater Parramatta Access Plan, in consultation with Council, RMS, other business units of Transport for NSW for the purposes of public exhibition. The GPAP must consider the following:

- o assessing the parking impacts of light rail construction and operation and detailing processes for mitigating lost parking (this can include kerbside management plans, changing rules for remaining parking, and increasing supply of parking away from the impacted areas)
- o identifying and assessing expected bus service changes and interchange arrangements both during construction and during operation.
- o identifying needed upgrades to legibility and wayfinding for all modes in and around Parramatta CBD.
- o identifying and planning for needed road capacity upgrades.
- o identifying and planning for needed walking and cycling upgrades.
- o identifying future rail provision including Sydney Metro West.
- o identifying how above improvements deliver an integrated transport solution, incorporating all modes, to meet the transport needs of all users in the Greater Parramatta area.

Recommended Conditions of Consent

C21 That prior to construction, the Applicant finalise the Greater Parramatta Access Plan in collaboration with Council, RMS and Transport for NSW.

3.3.2 Impact on Bus Services

Council is concerned in relation to the impact on bus travel times for Castle Hill and Windsor Road services during operation of the Light Rail. The Project results in the bus lanes being removed on Church Street between Victoria Road and Factory Street. Whilst it could be possible for buses to share the light rail alignment, albeit without being able to stop, buses will not be permitted to do so. Buses may also be delayed along other sections of the network away from the corridor in locations where they do not have priority such as Smith Street. In such locations

the additional traffic volumes and congestion will make it more difficult to provide bus priority in future.

Reference is made to a review of local bus routes within the GPOP priority growth area. Any bus service changes being considered in response to the light rail project should be identified and consulted upon as part of the EIS process.

It is acknowledged that congestion exists in the train station bus interchange and on some key bus routes into the Parramatta CBD. However, Council does not believe the best answers for relieving congestion are service reductions such as truncation and elimination of routes, particularly as they service areas that the Light Rail will not. Bus changes should be considered through an open and consultative process. In some cases, the best option for reducing congestion may be to provide additional facilities or optimise usage patterns in existing facilities. Parramatta North bus stop changes should also be considered as part of the EIS process.

The EIS refers to the reason for bus congestion being the number of services terminating at the interchange at Parramatta Station. Although it is understood that this presents difficulty for operations, another way to resolve this may be by investing in additional layover and interchange facilities at other convenient locations outside the Parramatta CBD.

3.3.3 Free Shuttle Bus (Route 900)

The EIS indicates that the free shuttle bus (Route 900) within the Parramatta CBD, which is run by Transport for NSW, is planned to be discontinued when construction of the Light Rail begins. This service is highly patronised by residents and visitors to Parramatta. It is unclear how this will affect people movement generally, and, specifically, movement to services for vulnerable community members. Council believes there is opportunity to re-route this free shuttle service around other parts of the Parramatta CBD during construction, and then to assess its need six months prior to operation of the Light Rail.

Recommended Conditions of Consent

C22 That the free shuttle bus continue operation throughout construction of the light rail, using an alternative route to be designed in consultation with the City of Parramatta Council.

C23 That 6 months prior to operation of the Project, that the Applicant and Council undertake an assessment of the patronage and future role of the shuttle service to determine its future operation.

3.3.4 Closure of the T6 Carlingford Line

The Project includes the closure of the T6 Carlingford Line between Parramatta Road, Clyde and Carlingford. This will also involve removal of rail assets at the existing level crossing (signals and boom gates) at Parramatta Road and closure of Rosehill Station. The EIS states that the Applicant is considering whether the closure of the line between Camellia and Parramatta Road, Clyde would also include removal of rail tracks.

During construction of the Project a shuttle bus service will operate between Carlingford and Parramatta, which would connect commuters to Parramatta via Carlingford, Rydalmere, Dundas and Telopea Stations.

Council raises the following issues in relation to the proposed shuttle service and closure of the T6 line:

- That commuters may not utilise the shuttle service as it would be longer travel times, especially those commuters travelling east to the Sydney CBD.

- Users of the Rosehill Station will have to walk to Camellia to catch the replacement bus. The impacts of these options in terms of travel time, service frequency, and comfort should be assessed.
- Should consider operation of the shuttle bus to Carlingford Court to service a greater catchment; and
- Consider future proofing the line between Camellia and Clyde as part of a southern extension for Light Rail.

Council supports the retention of existing rail tracks between Camellia and Clyde and ownership of the land with Transport for NSW, pending a further detailed assessment by Transport for NSW.

Recommendation

R27 That the Applicant assess the impact on existing commuters and impact of the proposed shuttle service, in terms of frequency, travel routes and catchment area.

Recommended Conditions of Consent

C24 That as part of the closure of the existing Clyde to Carlingford Line, the Applicant must undertake a detailed assessment of the impact on existing patrons and future transport to determine future capacity needs, including its role in an integrated transport network including Light Rail (proposed and future stages), Sydney West Metro and heavy rail network.

3.3.5 Parramatta CBD Road Corridor Analysis

To support the draft Parramatta CBD Planning Proposal, Council (together with TfNSW and RMS) has prepared a draft road corridor reservation analysis. The purpose of this work is to identify potential land that may be required for road widening and to include this land on the Local Road Acquisition (LRA) map. It is intended that this map be exhibited as part of the Draft Parramatta CBD Planning Proposal. The corridor work done so far is generally consistent with the EIS. However, as design progresses, updated CAD/GIS data should be regularly supplied to ensure Council can consider the impacts of the Light Rail Project on longer-term strategic transport and traffic planning in the Parramatta CBD.

Recommended Conditions of Consent

C25 The Applicant is to liaise with Council in relation to any amendments necessary for PLEP 2011 to accommodate reservations and acquisitions on the LRA map.

3.4 Impacts on Parking

3.4.1 On Street Parking Impacts

The EIS states that as a result of the construction and operation of the Light Rail and the off corridor works that:

- Approximately 863 on street parking spaces will be directly impacted by the project. Of these:
  - 402 on-street parking spaces will be impacted in the Parramatta CBD;
  - Around 168 are proposed to be relocated into adjacent streets; and
  - Loading zones, disabled parking, taxi ranks and service vehicle zones impacted by the project would be relocated, where possible, to the permanent location proposed for these users in adjacent side streets.

- The remaining spaces would be accommodated within surrounding streets where possible.
- All affected accessible parking spaces will be permanently relocated (wherever feasible) to adjacent side streets.
- Transport for NSW will work closely with City of Parramatta on strategies for residential parking and paid parking to mitigate longer term parking impacts.

Parking is an important consideration for Council and our community. In an urbanising area, less parking is needed when users switch to other modes of travel, however parking remains a priority for people who drive. Further analysis should be undertaken to ascertain the type and reason for parking, and characteristics (such as length of stay and pricing). This is necessary for considering whether parking replacements or alternatives can be found to meet community needs.

The EIS indicates a vacancy rate of 63% in the Parramatta CBD. This appears to be overstated as it includes areas beyond the Parramatta CBD and restricted operational spaces as available. In reality there is a much lower vacancy rate for the public seeking a space in the Parramatta CBD core.

The EIS identifies prioritisation of spaces for people with disabilities and commercial loading zones. Council supports reallocation of important on-street parking to nearby side streets. It is important to note that there are additional priorities for on-street parking including pick-up and drop-off zones, taxi stands, 5-minute parking, bus stops (for public and privately operated buses), mail, etc.

There are many users of Mobility Parking Scheme (for people with disabilities) permits using on-street spaces each day. The EIS states that approximately 25% of short stay spaces in Parramatta CBD were being used by Mobility Parking Scheme permit holders. These permits allow motorist to park all day for free in metered parking spaces that have a time limit greater than 1 hour. The project results in the loss of many of these parking spaces that are used by Mobility Parking Permit Holders. Management measures are required to be developed to assist the mobility impaired motorists in transitioning to using off-street car parks or public transport.

Furthermore, mobility parking is currently available along Hawkesbury Road and is used by patients of the Hospitals. Any relocation of this parking should be careful considered and in consultation with WSLHD.

For lost parking which is not replaced (including parking lost to replacement of affected critical parking) the impacts to the community, including type of parking, users affected, and the likelihood of finding alternative capacity, should be assessed, and appropriate mitigations developed. Mitigations may include realistic projections of mode share shift, adjusting restrictions on other nearby spaces to better serve demand, and finding additional sources of parking. Mitigations should consider Council's identified public parking strategies which seek to shift long stay parking out of the Parramatta CBD in favour of short stay parking. It may be worthwhile to provide park and ride spaces as mitigation for displaced long stay parking which is currently utilised by commuters.

Council welcomes the idea of developing a loading and servicing strategy in partnership with Council for the Parramatta CBD and Parramatta North. This should be planned as part of the design process and built as part of the project.

Recommended Conditions of Consent

C26 The Applicant shall prepare a Parking Offsets and Management Strategy in consultation with City of Parramatta Council, including the Traffic Committee, businesses and key stakeholders. The Strategy shall include:

- Identification of strategies to identify and address parking impacts for each precinct along the light rail corridor including replacement parking, residential parking schemes, and provision of clearways.
- Impacts on mobility parking schemes

C27 During construction, the Sydney Coordination Office shall coordinate the implementation of any parking offset and management strategies and lead the consultation with affected businesses, residents and land owners.

C28 That any disabled car parking spaces that are to be lost as a result of construction be replaced as close to the site as possible, so there is no overall net loss of disabled parking spots

C29 The project and the Sydney Coordination Office should work with Council to prioritise kerb-side use and relocate uses based on mutually-agreed priorities. Any parking mitigation measures go through the approvals processes with Council and/or RMS as road authorities.

3.4.2 School on Macquarie St - Parking Impacts

Macquarie Street would lose all of the on-street parking between Church Street and Hassall Street. The EIS comments that operational parking spaces could be relocated to the nearest side street. However, there are only two suitable side streets that have on-street parking - Horwood Place and Charles Street.

Two high-rise schools are currently being constructed on Macquarie Street between Charles Street and Smith Street, a Primary School and a High School. Both schools have considerable demand for pick up and set down facilities. Neither school will have on-site pick and set down facilities for parents or coaches (with a possible exception for disabled students at the high school). The high school only has a frontage to Macquarie Street, plus a short frontage to a narrow lane. The primary school has a short frontage to Charles Street and competes with NSW Police vehicles for the use of Little Street, which is a cul-de-sac to the south of the school. The EIS does not include any analysis of this issue nor details on how the loss of on-street parking on Macquarie Street at the 2 schools can be managed. There is also another smaller special needs school on the south side of Macquarie Street near Hassall Street and similarly there is no mention of this school.

The scramble crossing at the intersection of George Street and Smith Street is proposed to be replaced with a traditional crossing. This may also result in the need for increased pedestrian storage on the south east corner of this intersection, taking some of the school land.

Recommendation

R28 Before approval, the proponent should undertake further assessment of parking impacts and mitigation measures in relation to the High and Primary Schools along Macquarie Street. This should be completed with Council, RMS and Department of Education and Communities.

3.4.3 Park and Ride Facilities

Commuter parking should be identified as part of the design process and delivered with the project. Accessible parking spaces should be provided as required by law and standards. Sub-standard accessible spaces should be rebuilt as part of the project.

As announced by the NSW Government in March 2015, a new commuter car park will be constructed at Carlingford with capacity for up to 150 spaces. There is an opportunity as part of the Project to deliver the commuter car park in conjunction with the opening of the light trail in 2023 for the immediate use of light rail patrons. Furthermore, it is noted that parking surveys were not conducted in Carlingford. Council is concerned that the Project will impact on street and commuter car parking (off street). Any loss of existing off street car parking in Carlingford is to be replaced with a dedicated commuter car park.

There is also an opportunity that a temporary commuter car park can be delivered at Camellia to service patrons of the light rail, especially those commuters wanting to journey to Parramatta to use the heavy rail line and during special events at Rosehill and in Parramatta CBD. Furthermore, there is opportunity to investigate commuter car parking spaces at both Dundas and Rydalmere.

Recommendation

R29 That the Applicant investigate opportunities for future provision of commuter car parking, including at Dundas, Rydalmere and other suitable locations.

Recommended Conditions of Consent

C30 Prior to operation of the Project, the Applicant shall construct a permanent commuter car park at Carlingford for capacity of approximately 150 car spaces.

C31 Prior to operation of the Project, the Applicant shall construct a temporary commuter car park at Camellia in proximity to the Light Rail Stop.

3.5 Property Access

3.5.1 Parramatta Square Access Arrangements

Parramatta Square driveway access

Parramatta Square car park is currently proposed to have two vehicle accesses once operational: one to Macquarie Street and one to Smith Street/Station Street at Darcy Street. A ban on general traffic (with an exemption for buses and taxis) turning right into Darcy Street was in place prior to construction of Parramatta Square; the purpose of the ban was to restrict traffic volumes near the Parramatta CBD's main pedestrian and public transport interchange. A right turn for general traffic from Smith Street into the Darcy Street access is currently not approved for Parramatta Square because it is not considered to be possible to allow this turn into the driveway and simultaneously restrict general traffic from turning right into Darcy Street. Accordingly, the main Parramatta Square entry for traffic approaching from the north is to be via Macquarie Street. Similarly, as Macquarie Street currently operates in a westbound direction, the main entry for traffic approaching from the east is also via Macquarie Street.

The EIS proposes to removes access from Macquarie Street to the basement, making Darcy Street the only entry option. As detailed above, the right turn from Smith Street into Darcy Street is currently not considered to be feasible. The Light Rail modelling assumes that the right turn can be made onto Darcy Street, and that all traffic enters via Darcy Street access. However, it simultaneously shows a reduction in queueing and delays at the intersection of Darcy

Street/Smith Street/Station Street. This result requires clarification, as it is expected that making Darcy Street the only access point would have the effect of *worsening* traffic at that point, not improving it.

A single entry point for Parramatta Square is not best practice, as it does not provide for redundancy if there is a failure at this location, particularly in an emergency. The exit from the Macquarie Street access is proposed to be permitted in the project, however, this would result in the footpath on the north side of Macquarie Street being narrowed. Council does not support any changes to the Parramatta Square entry/exit to Macquarie Street (as already approved).

Parramatta Square access arrangement during construction

Construction of 3 Parramatta Square (153 Macquarie Street), 4 Parramatta Square (tower closest to the Sydney Water building), and Parramatta Square's shared basement, has commenced, with construction access off Macquarie Street in the vicinity of the proposed Light Rail stop. The only construction access for 5 Parramatta Square (Council Civic Building) is off Macquarie Street, and Parramatta Square (particularly 3PS) requires use of Macquarie Street for movement of equipment and materials, and as a works zone. If Light Rail construction overlaps with Parramatta Square construction, this may impose unreasonable constraints on construction of either or both.

Recommended Conditions of Consent

C32 The Project shall provide for a right-hand turn from Smith Street (southbound) into Macquarie Street (westbound).

C33 The Project shall not impede the continuous and unencumbered ingress and egress of the approved Parramatta Square vehicle access to Macquarie Street throughout construction and operation of the Light Rail, unless by prior agreement with Council.

3.5.2 Waste Services

As already highlighted in the consultation phase (refer to EIS Vol 1A, Section 4.3), Council is concerned about both construction and operational impacts on access for domestic and commercial (business) waste services.

Recommendation

R30 The Applicant is to provide more detail in regards to construction period and staged operational impacts of the Project on waste servicing and vehicle access to affected residents and businesses across all precincts. This should also be addressed in Vol 1A Management and Mitigation Measures (Section 10.12.4).

Recommended Conditions of Consent

C34 Prior to commencement of works, the Applicant and construction contractors are to work with Council and its waste collection service to ensure waste collections can operate effectively during staging of construction and operation of the Project.

3.6 Pedestrian and Cycling

3.6.1 Impacts on Pedestrians

Regarding impacts of construction on pedestrians, it is stated that vulnerable users will be considered in design development in accordance with legislative requirements. Legal requirements represent minimal obligations; Council believes the needs of all users should be

designed for as a matter of principle. Infrastructure for vulnerable users should be applied firstly to meet the needs of all users, and secondarily to satisfy legal requirements.

Regarding pedestrian safety at worksites, the reference to considering CCTV where blind spots cannot be avoided should be reconsidered to convey in positive terms that unsafe conditions will be avoided and if they can't be avoided, made safe.

A 40km/h general traffic speed limit should be established in Westmead and Parramatta CBD to facilitate active travel accessibility, both cycling and walking. This should be investigated by the project during design, to be implemented during construction, as many of the benefits of lower speeds can be seen as mitigations for some of the potential impacts of the project such as reduced room for walking and cycling facilities on- and off-alignment.

Light rail stops in Parramatta CBD should integrate seamlessly with footpaths and existing land uses, and with nearby transport facilities such as Parramatta Train Station.

To facilitate ease of movement in areas of high activity, pedestrian crossings such as on Church Street and Macquarie Street in CBD and across Hawkesbury Road in Westmead, should remain open as much as possible during construction.

As outlined in 5 and 6 of the Submission school access impacts should be assessed and negative impacts mitigated in all precincts. This includes impacts to school zones but also impacts to walking routes, formal and informal crossings, pick-up and drop-off and circulation caused by on- and off-alignment works and traffic changes.

Church Street (south of Victoria Road)
The proposed changes in Church Street include removing the scramble crossings and replacing them with traditional pedestrian crossings. The EIS also states that the midblock pedestrian crossings would be removed. The EIS states that uncontrolled crossing of Church Street for pedestrians would be encouraged, however, it is not stated how this would affect, or be affected by, the operating speed of the light rail.

Hawkesbury Road- During Construction

The EIS acknowledges that pedestrian impacts will be particularly acute during the construction phase, and this will more seriously impact those with mobility challenges. Because Hawkesbury Road constitutes a major thoroughfare between public transport and the hospitals and institutions, the construction phase is more likely to impact people with varying degrees of mobility, especially visitors and workers to the Hospital Precinct.

Pedestrian access along Hawkesbury Road during the construction phase is critical to maintain, particularly during the construction phase of the project. A project of this nature is likely constrict access along Hawkesbury Road and make it more difficult to get from public transport stops to Westmead Hospital. This impact will be particularly impactful for those who face mobility challenges.

Recommended Conditions of Consent

C35 During construction, the Applicant, ensures that accessibility of Hawkesbury Road be maintained, especially along routes to and from key hospital and institutions entrances to and from the Railway Station.

C36 Prior to Commencement of Works, a Pedestrian Access and Network Plan is to be prepared in consultation with Council, RMS and relevant Reference Groups. The Plan shall identify current and proposed pedestrian paths during construction and operation, including the facilitation of future pedestrian paths identified by both State and City of

Parramatta Council with the objective of providing prioritised, seamless, coherent and safe pedestrian access throughout and adjacent to the corridor. The Plan will address:

- "access for all" ensuring those with mobility aids, wheelchairs or scooters can continue to access the corridor;
- existing and proposed local and regional pedestrian facilities and strategies;
- safety for pedestrians in pedestrianised zones;
- alternative pedestrian routes during construction based on safety and coherence, and contingencies in the event that relocated routes are found to be inadequate;
- demand for pedestrian facilities with consideration to encouraging an increased pedestrian mode share;
- signage and wayfinding along the routes;
- the requirements of relevant design standards, including Austroads and RMS guidelines.

The Applicant shall be responsible for implementing the Pedestrian Access and Network Plan.

3.6.2 Impacts on Cyclists

Council is strongly supportive of the Applicant's commitment to funding the regional cycle route along the Carlingford to Camellia corridor. Note detailed comments relating to the Carlingford Active Transport Link is provided in the Precinct Section 2.4.

The EIS analysis in relation to cycling was based on a cycling route map produced in 2008 by the South West Area Health Service. The document does not address the NSW Government's key Cycling document, *Sydney's Cycling Future* that identified key cycling corridors directly influenced by the project, as well as prescribing route typologies. Therefore, the EIS does not reflects the current state of the network nor the planned future cycling network. The City of Parramatta Bike Plan was placed on public exhibition between 10 April and 8 May 2017 and subsequently endorsed by Council on 13 June 2017.

Council considers that the critical regional cycleway connections that must be maintained through construction and operation:

- T-Way Cycleway, an existing separated (from general traffic) cycling facility in Westmead from the corner of Darcy Road, across Hawkesbury Road to the existing separated cycleway on the northern end Queens Rd.
- Parramatta Valley Cycleway, an existing 3m-wide shared path at WSU Campus, Gasworks Bridge, Lennox Bridge Portals, under O'Connell St, the busiest route in Western Sydney. It must be separated from general traffic and a clear width of 3 metres at all times.
- Foreshore path through Queens Wharf Reserve, 2.5m wide shared path between Parramatta Quay and Noller Parade, must be maintained
- Shared path on the western side of James Ruse Drive between Hassall St and Thomas St. This is the last river crossing for cyclists until Silverwater Bridge, and must be maintained through construction.
- Shared paths on the western side of O'Connell Street between Victoria Road and Macquarie Street, eastern side between Albert and Argyle Streets. These are currently the only north-south connection through the Parramatta CBD that are off road. These 3m wide shared paths must be maintained through construction and operation.

The EIS states that the existing on-road cycling route on Church Street would be replaced by alternative north-south cycling connections in the Parramatta CBD. No route is mentioned and

there will be significant difficulty in achieving this in the two closest parallel streets (Marsden Street and Smith Street) due to the higher traffic volumes and speeds.

It is recommended that a prior to Commencement of Works, a Cyclist Access Plan is to be prepared in consultation with Council, RMS, BicycleNSW and relevant Reference Groups, including the City of Parramatta Cycleways Advisory Committee. The Plan shall identify current and proposed cyclist paths during construction and operation, including the facilitation of future cyclist paths identified by both State and Local Government with the objective of providing seamless, coherent and safe cyclist access throughout and adjacent to the corridor.

Construction Impacts

The EIS states "where cycle routes and cycleways are impacted by construction worksites, alternate routes would be identified and implemented through appropriate signage and in consultation with Bicycle User Groups and the relevant Road Authority." Council is concerned that the EIS does not take into account the existing cycle route typology. A large portion of the community only feel safe using shared paths and bicycle paths that are physically separated from general traffic. If alternate routes are implemented, it must be a facility of equivalent level of safety and separation from general traffic.

Cyclist access during construction is not addressed for the Westmead precinct, which has a key regional cycling link along the T-Way-Hawkesbury Road-Queens Road, nor the Parramatta CBD where Church Street and Macquarie Street are currently used by cyclists to access key destinations.

The Applicant, when preparing the Cyclist Access Plan in all precincts must ensure that where cycle routes and cycleways are impacted by construction worksites, any alternate routes identified must provide an equivalent level of safety and separation from general traffic during construction.

Parramatta CBD to Camellia Cycle Link

As the proposed light rail route will interrupt existing east west cycle access between Parramatta CBD and Camellia, Council considers it prudent to request the Applicant to prepare a conceptual design for a future dedicated cycleway along connecting the Tudor Gatehouse at O'Connell Street to the Active Transport Link bridge over James Ruse Drive. This route shall be developed in consultation with Council and RMS and be located along a route that would be desirable for cyclist use. Construction of the cycleway is not included as part of the SSI.

Light Rail and Pedestrian Zones

The EIS proposes sections of Church and Macquarie Streets to be "Light Rail and Pedestrian Zones" with no legal cyclist access along these streets. These two streets currently provide access to a significant number of key destinations. The Applicant during the development of the Cyclist Access Plan must demonstrate how cyclists may legally travel along those streets without dismounting or alternative solutions are provided.

Bicycle Parking

The EIS details that a number of stops will have uncovered bicycle hoops for bicycle parking. Best practice design of bicycle parking requires design for both weather protection and security. Therefore, Council requires bike parking at key locations along the routes, including Westmead, Fennel Street, Tramway Avenue, Rydalmere, Dundas, Telopea, Carlingford. These are to be provided within standard TfNSW Opal accessible bike sheds as per current best practice.

Recommended Conditions of Consent

C37 Prior to Commencement of Works, a Cyclist Access and Network Plan is to be prepared in consultation and to the satisfaction of Council, RMS, BicycleNSW and relevant Reference Groups. The Plan shall identify current and proposed cyclist paths during construction and operation, including the facilitation of future cyclist paths identified by both State and Local Government with the objective of providing seamless, coherent and safe cyclist access throughout and adjacent to the corridor. The Plan must address:

- cyclist access to all streets (including alternative solutions that allow cyclists to legally travel without dismounting along streets where general traffic lanes are removed);
- existing and proposed local and regional cyclist facilities and strategies;
- alternative cyclist routes during construction based on safety, coherence and consistency with the existing route, and contingencies in the event that relocated routes are found to be inadequate;
- demand for cyclist facilities with consideration to encouraging an increased cyclist mode share;
- bicycle storage facilities on light rail vehicles;
- best practice bicycle storage at light rail stops;
- signage and wayfinding along the routes;
- the requirements of relevant design standards, including Austroads and NSW bicycle guidelines.

C38 The Applicant shall implement the Cyclist Access and Network Plan.

C39 The Applicant shall ensure all stops are designed to ensure safety, connectivity, efficiency and convenience is maximised for pedestrian and cyclists. This includes identification of connecting paths, cycleways and appropriately located and designed bicycle parking.

C40 The Applicant to prepare a conceptual design for a future dedicated cycleway between the Tudor Gatehouse at O'Connell Street to the Active Transport Link bridge over James Ruse Drive. This route shall be developed in consultation with Council and RMS and be located along a route that would be desirable for cyclist use. Construction of the cycleway is not included as part of the SSI.

3.7 Future Proofing of Light Rail

Overall, the EIS does not take into account the likely cumulative impact of growth in the light rail catchment and the resultant construction and operational impacts. While Tables 9.1 and 9.2 outline some of the development which is likely to coincide with the project, major elements of the likely growth scenario have been omitted. For example, the Parramatta CBD Planning Proposal which envisions more than 20,000 additional dwellings and 48,000 additional jobs in the Parramatta CBD, as has the Camellia planning process, which the DPE is currently planning for 10,000 dwellings.

Furthermore, the EIS does not make a reasonable attempt to predict potential growth that the light rail might be catalyst for in the future; while its potential role as an agent of change is generally discussed, there are no details regarding the likely scale or location of that growth.

It is crucial that further work is undertaken, and relevant sections of the EIS updated to reflect likely growth scenarios prior to determination. The *Interim Parramatta Land Use and Implementation Plan (ILUIIP)* should be a guiding document for laying the groundwork of likely growth scenarios; however, it should also be noted that Council officers have raised concerns with the accuracy of the likely growth envisioned in the current version of the ILUIIP. Furthermore, because the ILUIIP uses a 2036 timescale to plan for long-term growth in the

corridor, it is recommended that a 2036 scenario be modelled (in addition to the 2026 scenario already undertaken). An improved understanding for growth scenarios is fundamentally important to the project, particularly with regards to traffic modelling, future-proofing requirements and managing cumulative construction impacts.

Recommendation

R31 That prior to determination of the EIS, a more detailed analysis of growth scenarios and likely capacity of the Project. This analysis is to be based on future growth scenarios agreed with Council at the beginning of the process.

R32 That the Applicant present to DPE and Council the analysis and measures for future-proofing the light rail for future growth scenarios. These measures should include, but not be limited to, options to enable increased frequency, additional stops and establishing an indicative future light rail network including extensions / lines for investigation.

4.0 Urban and Technical Design

4.1 Design Detail

It is Council's strongest preference that the design of the Parramatta Light Rail is an integrated response, providing high-quality public domain. Light rail should be seamlessly integrated into the urban fabric in terms of materials, levels, finishes, and alignment and stop locations.

Council is concerned that the EIS provides limited design detail, presenting only indicative or diagrammatic design of light rail elements, therefore associated urban design and public domain outcomes are not clear.

Council understands that Transport for NSW (TfNSW) is currently undertaking some detail design along the corridor. Working with TfNSW, Council strongly supports the following approach to design development for the project:

- Resolution of key urban design issues, including impacts on heritage, trees, pedestrian permeability, urban functions such as outdoor dining and public domain assets; and
- Provision of design detail for key elements**,** including streets, stops, bridges, culverts, pedestrian and cycleways, integration with heritage.

These approaches are provided in more detail further below.

Given the limited design detail in the EIS, Council has prepared the following key reference documents:

- Parramatta Light Rail Framework Plan (Volume 1)
- Parramatta Light Rail Technical Requirements (Volume 2)

Volume 1 outlines Council's key issues, strategies, alignment and stop options, and recommendations and requirements for design refinement. The intention of this document is to inform the preparation of TfNSW Urban Design Requirements and to provide a framework through which any changes proposed by TfNSW or the contractor can begin to be evaluated. Volume 2 outlines Council's Technical Requirements for the project.

Council requests that both volumes are required to be reference design documents for the Project. Section 2 of Council's EIS Submission refers to Volume 1 and this Section (Section 4), will refer to Volume 2 - Technical Requirements.

Recommended Conditions of Consent

C41 The City of Parramatta Light Rail Technical Requirements (Volume 2) are to be incorporated into the final Urban Design Requirements. That the Urban Design Requirements are finalised by Transport for NSW in collaboration with the City of Parramatta.

C42 The Applicant shall establish an Independent Design Review Panel and shall be responsible for reviewing and endorsing significant design aspects of the project. The Panel representatives shall be approved by the Secretary of the Department of Planning and Environment and comprise appropriately skilled professionals employed in the fields of architecture, landscape design and heritage. One member of the panel is to be nominated by the City of Parramatta Council.

4.2 Design Flexibility

Council notes that the EIS (Section 5.1) outlines 'flexibility provisions' in the project design, that is, allow for 'reasonable' changes to elements such as stop location or design, or substation

provision. The EIS is intended to represent a 'realistic worst case'. The reason for this flexibility is due to future private contractor involvement, together with refinements following community and stakeholder feedback.

Council is of the very strong view that the ability for TFNSW to change design "without the need for additional assessment or approvals" should only be the case if the change is substantially within Project parameters that have been sufficiently defined, otherwise undesirable outcomes can result where insufficient consultation and assessment has occurred. Council notes that the design refinements / changes that are contemplated in Table 5.1. The view of Council as landowners and representatives of the local community should be taken into consideration, and the Applicant should be obliged to incorporate Council's views rather than simply consider. Council considers that it is not possible to assess impacts of changes to the design in the hypothetical, and that even minor changes may in fact have significant implications for the overall public domain outcome.

Council believes that the proposed methodology outlined in the EIS to allow changes to what is already a broad range design that lacks in detail, is not appropriate. There is greater information provided in the EIS about what can be amended subsequent to the planning approval rather than what is definitive and cannot be changed. Whilst Council agrees that a certain degree of flexibility is required, we request that a Condition of Consent to any changes contemplated particularly by Table 5.1 is conditioned such that Council, as the major land owner and representatives of the local community and with a greater understanding of the overall public urban domain strategic outcome, are consulted by TFNSW, and Council comments are required to be adopted and incorporated rather than simply "*taken into consideration"* as proposed.

Recommendations

R33 That prior to approval, DPE and the Applicant, discuss with Council any proposed condition of consent relating design flexibility and Table 5.1.

R34 In relation to areas of project flexibility, Council requests the following amendments to the Table 5.1:

- Tree Planting outside Project Corridor: Council request that the areas identified as suitable for planting of replacement / offset trees are discussed and agreed by Council, that an offset ratio of replacement new trees for old is to be defined, and it is suggested that a ratio of up to 8 new trees for old is required.
- Survey / utility / lighting works - a 1 km radius is too great, 200m would be more appropriate.
- Substations and related utilities – Council is concerned that substations and relocation of proposed substations should not be allowed without further consultation and planning approval. These are significant structures with potentially significant impact on the public urban domain. It is noted that this element was a very significant issue on the Sydney South East Light Rail project with significant impact and adverse outcomes to the public domain in some locations.
- Road network changes including off – corridor works - There must be consultation with Council and comments taken into account and incorporated.
- New or widened bridges - New or widened bridges could have significant knock on impacts and therefore Council must be consulted and comments incorporated.

4.3 Design of Key Elements

Council requests that all significant built form (stabling and maintenance yard, driver facilities, substations, station buildings to be retained) are designed to seamlessly integrate into the

surrounding built fabric and shall be subject to ongoing design review by City of Parramatta to ensure outcomes are compatible with the existing and future urban context.

All bridges are to be sensitively designed as cohesive urban elements and include an integrated design approach to active travel, environmental requirements and any noise barriers, visual privacy or safety screens deemed to be required as part of the project.

Recommended Conditions of Consent

C43 That the Applicant prepare design drawings of the following key elements for the review by Council:

- Westmead Transport Interchange
- Driver facilities at Westmead and Carlingford
- Stabling and Maintenance facility at Camellia
- Culverts
- Bridge from Westmead to Parramatta North
- Bridge over Clay Cliff Creek and James Ruse Drive
- Bridge over Parramatta River from Camellia to Rydalmere
- Bridge over vineyard creek at Rydalmere
- Bridge over Kissing Point Road, Dundas
- Modifications to Lennox Bridge
- Modifications to Victoria Road Bridge, Rydalmere
- Modifications to Kissing Point Road Bridge, Dundas
- Modifications to Adderton Road Bridge, Telopea
- Modification to Pennant Hills Road Bridge, Carlingford

4.4 Design of Key Streets or Corridors

Detail design of streets affected by on and off corridor works including key urban functions, materials and finishes, landscape and water sensitive urban design, pedestrian amenity, active transport response. The detailed drawings will demonstrate how the Project will be seamlessly integrated within a high quality, upgraded public domain setting.

The EIS promotes the differentiation of track bed paving finish for all streets to distinguish pedestrian and light rail track zones. This principle should not be applied in pedestrianised zones in Church Street and Macquarie Street. Council supports an integrated paving solution to reflect pedestrian priority in these locations.

Recommended Conditions of Consent

C44 That the Applicant prepare detailed design drawings of key streets for on and off light rail corridor for the review by Council at the following locations:

- Hawkesbury Rd, Westmead
- Hainsworth Street, Westmead
- Bridge Rd, Westmead
- River Rd, Parramatta North
- Factory Street, Parramatta North
- Albert Street, Parramatta North
- O'Connell Street, Parramatta North and Parramatta
- Church Street, Parramatta North
- Church Street, Parramatta
- Macquarie St, Parramatta
- George St, Parramatta
- Tramway Avenue, Rosehill
- Alfred Street, Rosehill
- Converted Sandown Line, Camellia
- Grand Avenue, Camellia
- Converted T6 Carlingford Line

4.5 Levels

A key principle which will determine seamless integration of the public domain with the Project is for the alignment along streets to reduce the need for level changes for between both the public domain and at the property boundary adjacent to development.

The rationalisation of levels around all stop locations and in the corridor condition are required, ensuring meeting relevant Universal Design principles, DDA and BCA requirements for accessibility. The EIS indicates that level changes across all sections appear to be excessive. For example, ramp access is shown to platform ends, impacting on the level changes along the platform length. Where there is a zero lot setback to adjacent development, footpath level adjustments will be problematic.

Recommended Conditions of Consent

C45 The design of the project must ensure that re-grading of levels and finishes is not to negatively impact on the public domain including consideration of the following:

- existing trees scheduled for retention;
- access;
- drainage;
- interface with existing buildings or those in construction or with development consent;
- Universal Design Principles;
- Council's Public Domain Guidelines 2017.

C46 Key requirements regarding level changes in the public domain will include the following (in accordance with Council's Public Domain Guidelines 2017):

- No change to existing property boundary levels. Existing entries to existing properties cannot be changed.
- Pedestrian footway cross-fall between 1 and 2.5%.
- Minimum Clear Path of Travel 2.4m in Church and Macquarie Streets, and 1.8m for other locations.
- Maximum kerb height 150mm in line with typical street condition.
- Consistent longitudinal falls on all pedestrian pavements are to be maintained and/or achieved. Sudden level changes in the pedestrian pavement are not acceptable.

4.6 Light Rail Stops, Shelters and Platforms

Light rail stops should be designed to promote the provision of new public domain areas, maximise pedestrian permeability, minimise clutter and avoid the use of barriers, fences and median islands.

Accessibility requirements should be met for the design of all light rail stops, with careful consideration of the main path of travel between light rail stops and interchange to other modes (i.e. heavy rail, metro, bus, ferry etc) and the main path of travel from light rail stop to adjacent main streets and parking facilities.

The shelter design must respond to local identity in its form, materiality and function. Use of existing/refurbished or new awnings on adjacent buildings in lieu of an additional shelter structure in the following locations should be considered for Church Street Eat Street Stop and the Parramatta North Cumberland Hospital stop.

When the design detail for typical platform layouts are produced by the Applicant they should illustrate the proposed arrangement of finishes, fixtures and fittings for side and central light rail

platforms and typical access arrangements are to be provided. In addition, typical set-out and surface finishes including paving finishes, barriers, fences, tactile indicators, shelters, access ramps, signage, ticketing infrastructure and bins. Stop platform finishes are to be flush with adjacent footpaths.

The Applicant shall produce a stop prototype for two purposes – firstly to allow design refinement; and secondly to allow engagement with the user groups, community and stakeholders. Council recommends the Fennel St car park site as a potential location for the prototype.

Continuous 45 metre shelters are not appropriate at all stop locations. Long shelters block sight lines, reduce legibility and become divisive elements in an urban street context with a glazed or solid wall panel. A 'light touch' is required with regard to the design and extent of new elements in the street. Site specific responses for shelters in streets such as Church and Macquarie Streets are required, for example use of existing awnings. Smaller bus stop style shelters may be appropriate for some stop locations outside the city and town centre.

Recommended Conditions of Consent

C47 That detailed design drawings of Light Rail Stops be produced for City of Parramatta Council's review which demonstrates the following:

- Meet accessibility requirements;
- Main path of travel between light trail stops and interchange to other modes, main streets and parking facilities;
- Promote the provision of new public domain areas, not form a barrier within the urban structure, maximise pedestrian permeability, minimise clutter and avoid the use of barriers, fences and median islands generally
- Stop platform finishes to be flush with adjacent footpaths.
- Shelter and associated furniture to follow an integrated design.
- The use of existing awnings as shelters where appropriate,
- Be responsive to local character, including heritage, as well as intermodal interchanges at the following locations:
  - Westmead Terminus
  - Prince Alfred Square Stop
  - Parramatta North Cumberland Hospital Stop
  - Church Street Stop
  - Parramatta Square Stop
  - Harris Street Stop
  - Tramway/Robin Thomas/Rosehill Stop
  - WSU/Rydalmere Stop
  - Dundas Stop
  - Carlingford Stop

C48 That the Applicant produce a stop prototype.

4.7 Overhead Wires and Poles

The EIS assumes overhead wires are provided on a whole-of-corridor basis. Due to heritage and streetscape amenity reasons, Council requests that overhead wire-free running is to be implemented in the following locations:

- Hawkesbury Road, Westmead to corner of Factory and Church Street, North Parramatta (from stop to stop); and

- Prince Alfred Square stop, Parramatta to Rosehill (from stop to stop)

Furthermore, any catenary wire in the Parramatta CBD is of particular concern given the potential to limit height of activity for parades and events and the restrictions on emergency vehicles, particularly fire trucks.

Where overhead wires are provided, they are to be placed as part of an overall composition responding to both urban design, including built form, tree and lighting placement and underground utilities requirements.

Pole chainage is to be subjected to the following priorities:

- Platform poles are consistently located through all stops;
- Centre poles or side poles to align with prevalent items of the streetscape such as trees or built form; and
- Side poles in curves to align with prevalent surrounding structure rather than track bed.

Recommended Conditions of Consent

C49 The project shall be designed, constructed and operated wire-free from:

- Its commencement at Westmead through to corner of Factory and Church Street at North Parramatta;
- Victoria Road, Parramatta CBD to Tramway Avenue Light Rail Stop, Rosehill

C50 Where new poles are required, the design and placement of these poles as required for the operation of the light rail are to be agreed with Council. Redundant poles in the immediate vicinity (30 m) of new poles should be removed to minimise visual clutter.

4.8 Lighting and Multi-Function Poles

Multifunction poles (integrating signals, CCTV, alert high speakers and lighting) are required when possible in order to avoid clutter of public domain and underground services. Existing street lighting poles along the light rail alignment and at stops are to be:

- removed and replaced with integrated, side mounted multi-function poles (which also carry wires and CCTV), wherever side poles are proposed.
- removed and replaced with new multi-function poles and/or lighting wherever centre-poles are proposed.
- designed and delivered in close consultation with Council.
- located with due consideration to function, spacing, and location of other dominant urban items such as signs, CCTV, trees, other poles etc.
- consistent with overall design/form of Council multi-function poles.

Light quality (power, source, direction) and lighting management to be consistent with Council's lighting requirements. The use of innovative lighting management is to be developed, including dimmable power to avoid adverse visual impacts residents and fauna and flora, tuneable light colour to adapt public space night identity to actual needs.

Technology requirements should be included in the integration of multi-function poles and shelter design, sensors, digitized wayfinding and screen information, fibre and access to data. In addition to static signage, digital information boards should be provided to display all modes present within the catchment area in an integrated traveller oriented manner.

Recommended Conditions of Consent

C51 Where possible, the Applicant must ensure multifunction poles integrate signals, CCTV, alert high speakers, digitalised wayfinding, screen information, and lighting in order to avoid clutter of public domain.

C52 Light quality and management is to be consistent with Council's lighting requirements.

4.9 Vegetated Tracks

Council considers that the provision of vegetated tracks in some locations along the corridor will result in improved streetscape and place making outcomes. In addition, it will contribute to water management and managing urban heat. Irrigated vegetated tracks are to be implemented in the following locations:

Recommended Conditions of Consent*

C53 The project shall be designed, constructed and operated with vegetated tracks in the following locations:

- Railway Parade to Parramatta River, Westmead
- Church Street (between Factory Street to Victoria Road)
- Macarthur Street (between George St and Harris St) along George Street and Tramway Avenue to Tramway Ave stop.
- The Parramatta North Urban Transformation project site (between Green Up Drive and Warrinya Avenue)

C54 Prior to operation, the Applicant must develop a Management Plan which demonstrates:

- Adequate irrigation and drainage is provided to ensure sustained vegetation growth and health and safe use of the space;
- Appropriate species selection to suit site conditions, including wind impacts and solar access.
- A maintenance plan; and
- Where achievable, rainwater, stormwater or recycled water should be used.

**Note the above Recommended Condition may be amended as in relation to any alignment changes, as per Section 2.*

4.10 Pedestrian Permeability

The corridor must be designed so to maximise pedestrian and cycle permeability. Where the alignment runs adjacent to open space, ensure the light rail alignment does not divide open space areas or form a barrier. Provide regular pedestrian and bike crossings equal to or greater than existing crossings. Utilise refuge islands for safe crossing where required.

Pedestrian crossovers are typically proposed at stops and existing intersections. A detailed strategic review of proposed pedestrian crossing points is required on a whole of corridor basis to ensure the light rail does not create a barrier through the Parramatta LGA.

The use of fencing and barriers is to be avoided (generally). Where fencing or barriers are proposed, demonstrate that there is no other feasible alternative, for example reducing light rail speed, improving sight lines, additional design work.

Pedestrian crossings, must align where possible. Some pedestrian crossings are shown in a staggered arrangement across minor and major intersections in the EIS. Furthermore, a staggered outcome will require retrofitting of barriers, fences and tactile indicators to address the discontinuous clear path of travel incurring significant costs. This form of pedestrian crossing favours cars at the expense of pedestrians. A typical street condition should prevail in all

scenarios to reinforce street legibility in Parramatta and minimise unnecessary clutter. Pedestrian crossings, particularly at major intersections, must align.

Recommended Conditions of Consent

C55 The project shall be designed to maximise pedestrian permeability and ease of access to ensure that:

- Fencing and barriers are avoided;
- Pedestrian crossings, especially at major intersections, are aligned; and
- The Light Rail does not divide open space.

4.11 Trees

Where possible, Council seeks a consistent and legible green link along the light rail alignment. To this end Council's requires the provision of large, shady street trees with interconnecting canopies. Medium to large trees are requested with spacing 10 metres average where possible and canopy spread at least 8 metres. Detailed design drawings should consistently reflect this requirement.

Wherever possible mature existing trees in good health are to be retained and incorporated into the design of the Project. Trees scheduled for retention shall have adequate tree protection zones and measures put in place to ensure they are not disturbed, damaged or destroyed during construction works. Council's views on tree protection and heritage significant trees are further detailed elsewhere in this submission.

In Hawkesbury Road, Westmead and through the Parramatta CBD, Council requests the Project to achieve high amenity tree lined streets. In accordance with Council's Public Domain Guidelines for street tree planting, all trees in paving (vehicular or pedestrian) are to be planted in strata-cell or other pavement support conditions.

Recommended Conditions of Consent

C56 The Applicant in their detailed design incorporate trees within the corridor in consultation with Council.

C57 The Applicant shall design Hawkesbury Road to deliver a high amenity tree lined boulevard.

C58 The Applicant shall design and deliver street planting in accordance with the requirements of Council's Public Domain Guidelines (2017).

4.12 Signage and Advertising

Council requests that no third-party advertising will be permitted on the light rail rolling stock (external), stops or bridges as this will add to visual clutter and may conflict with Council overall visual / community information strategy

Recommended Conditions of Consent

C59 Third Party advertising shall not be permitted on light rail rolling stock, stops or bridges.

4.13 City Identity

Through a creative and curated approach to delivering a unique identity, the Parramatta Light Rail can deliver a city transformational transport infrastructure project that befits Sydney's Central City and is strategically aligned with the City's aspirations for arts and cultural

experiences as articulated in the City's *Culture and Our City: A Cultural Plan for the Parramatta CBD 2017-2022.* The Cultural Plan shares an ambition for a city that is "Driven by culture, Parramatta will be a world-class city known for its diversity and energy, with people, ideas and creativity at its core."

From a TfNSW perspective the identity of transport projects in NSW is typically set through signage, way finding and a common approach to standard elements such as rail stops, furniture etc. While these elements are designed to read together as a language and collectively form a consistent brand for the network and public transport customer, they are also permanent fixtures and features that are not always sympathetic or authentic to place.

Unique design and cultural elements are a powerful way of adding meaning and a personal connection for the commuter to the Parramatta Light Rail. If delivered well and as an integrated, non-negotiable element of the project, they can not only strengthen the character, identity and transformational potential of the Project but can also draw visitors to deliver a memorable experience that is much more than a mode of transport from point A to point B.

Through the development of curated approach to a new language of design, public art and interpretation Parramatta has the opportunity to deliver a project that will serve as both a much needed public transport connectivity but also a cultural experience for the customer that embodies curiosity and wonder, is authentic and speaks of this place and its stories, and has the potential to deliver a legacy project for the city that is memorable and loved by the community as well as a destination experience for visitors to the City of Parramatta.

Stage 1 of Parramatta Light Rail will be the first section of a much larger network focused on connectivity across greater Western Sydney. The approach to Stage 1 is particularly important as it will set the character, tone and identity for the entire network which should respond to local character and identity.

Public Art

The EIS states that public art will be an integrated part of the design, construction and operation of the system. Council strongly supports this initiative. Public art is an important part of the City. Following successful European examples, the realisation of a public art work that spans the full light rail alignment and expressed at each light rail stop would support a consistent 'design language' across the alignment. An example of this is Daniel Buren artwork in Tours, France.

It is recommended that a Public Art Strategy be prepared which includes potential locations along the corridor, including integrated with stops and outline of a dedicated budget. A draft Strategy should be submitted to Council for comment prior to the commencement of works.

Recommended Conditions of Consent

C60 That the Applicant prepare a Public Art Strategy during the detailed design stage to realise public art along the alignment and a dedicated budget. The Strategy should be prepared in collaboration with Council prior to the commencement of works.

Interpretation

Interpretation is separate from public art however in some cases public art can deliver an interpretation outcome. As discussed in Section 9 there are many opportunities for the light rail design to incorporate heritage interpretation, in particular through and adjacent to significant historic locations along the corridor.

Recommended Conditions of Consent

C61 That the Applicant prepare a Heritage Interpretation Strategy which identifies opportunities for interpretation of historic built heritage or landscape or archaeology. A draft Strategy should be submitted to Council for comment prior to the commencement of works.

Light Rail Stop Names

Naming of light rail stops to recognise historic or iconic values is positive but should also be locally relevant. The adoption of dual naming (English/Darug) is supported by Council to recognise the importance on the local Aboriginal connection to place and supporting both Council's Cultural Plan and Reconciliation Action Plan.

A consistent Parramatta Light Rail design language along the alignment will assist with the user experience and provide consistency with the user experience navigating the light rail. Stops should be clearly named to denote *place* rather than *use,* reflecting the changing nature of cities and the temporary nature of 'uses' in urban environments. Rail stops provide an appropriate location to connect local stories through both stop naming and interpretation elements incorporated into the rail stop design to engage users during waiting times at each rail stop. Rail stop furniture and shade structures also provide opportunities to deliver location specific interpretation outcomes.

Rolling Stock Design

A Parramatta Light Rail specific colour palette for the rolling stock is supported by Council so to provide a unique and recognisable icon and ambassador for the city and the community. There are strong precedents set for this in France through unique yet subtle design elements and use of a project specific colour palette. Similarly the new Honolulu Light Rail incorporates a 'rainbow graphic' as part of the external rolling stock design reference.[1]

A unique approach to colour and design could provide an opportunity to position the Parramatta Light Rail as symbolic of the 'Burra" or 'eel', from which Parramatta derives its name, as it snakes its way through the streets of Parramatta. Local aboriginal dreaming stories associated with the eel could be considered as part of the approach to Aboriginal interpretation for the project.

Rolling stock interior fit-out also provide an opportunity to showcase and celebrate local stories and position the light rail as a memorable cultural experience that is much more than public transport. 'Smart technology' design and user technologies could be incorporated into the internal fit-out – smart device charging units, free wifi with light rail specific content (local stories/podcasts, information on Light Rail public artworks, City of Parramatta radio station)

Recommended Conditions of Consent

C62 The Applicant shall prepare in collaboration with Council a City Identity Strategy for the Light Rail to ensure that the light rail rolling stock, public art, interpretation and the light rail stops reflect the cultural and historical identity of the City of Parramatta.

4.14 Substations

The EIS states that 8 substations are required along the corridor, however locations may be refined. Due to their size and bulk, Council is concerned that substations will have a material impact on the built environment. Therefore, where possible we request that substation be

[1] http://www.masstransitmag.com/press_release/12199204/honolulu-taps-init-for-smart-card-mobile-ticket-system

located underground. If substations are located aboveground they should be designed so to recede in their proposed settings.

Recommended Conditions of Consent

C63 The Applicant shall design substations, where possible to be located underground. If above ground, substations must be designed so as to minimise size and bulk and to integrate into the surrounding context or building. The overall size and massing of the proposed substations should not be increased from what has been identified. Additional substations not identified in the application are not permitted.

5.0 Social and Economic Impacts

5.1 Introduction

Overall, Council considers that the Project has extensive positive social and economic impacts. These include improved public and active transport access to sporting, entertainment and recreational infrastructure at Rosehill, Camellia (future) and the Parramatta CBD; health and medical services at Westmead; tertiary education at Rydalmere and Parramatta CBD; and employment centres at Rydalmere, Westmead and the Parramatta CBD.

There is also potential to enhance neighbourhood character and amenity through street upgrades. For residents living within the suburbs of Telopea and Dundas, the Light Rail has the potential to improve individual and household social mobility, and reduce inequality across the precinct. If the Light Rail is designed to enable east-west connections between communities on either side of the track in the Carlingford precinct, it will help to breakdown the physical barriers that currently limit social interaction and connection across the rail line. This will help the community within this precinct to be more welcoming and open, and encourage interaction with others in their neighbourhood.

For those people on low to very low incomes (including those who live in social housing dwellings), the Light Rail will make a positive social impact on the wellbeing of individuals in and around the corridor, through easier access to employment and education options at Rydalmere, Westmead and the Parramatta CBD, as well as essential support services.

As currently experienced by businesses and other entities in the Sydney CBD and local centres in the Randwick LGA, the construction period for light rail may cause significant disruption to day to day business operations. This section details Council's recommendations for further work and conditions of consent, which focus mainly on managing and mitigating economic impacts during construction.

Demographic assumptions
The Social Impact Assessment (Technical Paper 15 of the EIS) relies on 2011 Census data to analyse the characteristics of the community within the study area. This information is now 6 years old and has been superseded by 2016 Census data. There are some demographic characteristics which are widely divergent (for example, the population of the Westmead precinct is noted as 3,733 whereas the 2016 Census data reflects a figure nearly 3 times this at 9,554). Council recommend that further work be undertaken to better inform the Light Rail project team to prepare and support the community throughout construction and operation, for example in the preparation of a Community Engagement Strategy.

Recommendation

R35 That the Applicant revise the Social Impact Assessment to include updated demographic analysis for Carlingford to Rydalmere; Camellia and Rosehill; Parramatta CBD; Parramatta North and Westmead based on 2016 Census data, and a summary provided that identifies where the data and trends show a significant variation between 2011 and 2016 population characteristics. The 2016 information should inform and be used by the Light Rail project team to prepare and support the community throughout construction and operation.

5.2 Stakeholder and Community Engagement

Effective and timely stakeholder and community engagement is critical for a construction project of this size and length. Engagement with the community provides an opportunity to understand

varied points of view, gather comprehensive information and therefore make better decisions and responses to impacts. Engagement also increases community understanding and builds support for the projects goals, whilst improving transparency and accountability.

Council is supportive of the initiatives proposed by the Applicant in the EIS (Appendix D Community Consultation Framework) including the development and implementation of a Community Engagement Strategy, dedicated Precinct Managers and the provision of regular updates using a number of different platforms.

However, Council raises some concerns in relation to the lack of detail around the frequency of communication with each stakeholder group and communication for high impact groups such as Church Street businesses. There is no current commitment to a program of collation of data over time from the community, businesses and stakeholders or to the identification of issues and concerns in real time in order to respond promptly to the community. Council recommends the following draft Conditions of Consent.

Recommended Conditions of Consent

C64 That prior to the commencement of works, the Applicant prepare a Community Engagement Strategy which provides for the following:

- Procedures and mechanisms for the regular dissemination of information (in English, Mandarin, Cantonese and Korean) to the community and stakeholders on construction progress and matters associated with environmental management;
- Procedures and mechanisms through which the community and stakeholders can discuss or provide feedback to the Applicant and/or Environmental Representative in relation to the environmental management and delivery of the Project including regular community satisfaction surveys;
- The retention of the current 24-hour hot line call number, website, and email contact throughout the period of construction, and the updating of the Project website in real time (i.e. when changes occur, rather than monthly;
- Provision of wayfinding advice including information updates in real time via a digital means such as mobile APPS and email or SMS alerts;
- The retention of the four Place Manager roles throughout the period of construction.
- Procedures and mechanisms to be implemented to respond to any issues/disputes that arise between parties on the matters relating to environmental management, design and the Project delivery;
- Procedures and mechanisms through which the Applicant can respond to any enquiries or feedback from the community and stakeholders in relation to the environmental management and delivery of the Project.
- A commitment to updating all communications channels frequently when new communication comes to light. Ideally the updating of channels would occur in real time for electronic communication platforms and weekly for other channels.
- A clear outline and commitment to a schedule of communication which outlines how the Project will engage with Council fortnightly meetings and weekly during construction is desirable which includes regular updates on the issues register being maintained by the Project.
- Identification of stakeholders to be targeted as part of the strategy, including community and business stakeholders, environmental and transport groups, student groups and adjoining property owners;

- Identification of high and low impact stakeholders with a clear communication schedule that outlines a commitment to how regularly information updates will be provided. It is recommended that broad based communication is quarterly but high impact users receive monthly updates and weekly updates during construction.
- Acknowledgement of students as a significant stakeholder group and a strategy for addressing this group particularly with regard to safety during construction in light of the propensity for younger age groups to use electronic devices while crossing roads.
- Acknowledgement of large employers as significant stakeholders that will require regular information and communication.
- A Business Consultation and Activation Plan that addresses access for business to a 24-hour hotline to raise any issues or concerns.
- Attendance at the Darug Reference Panel and Council's Aboriginal and Torres Strait Islander Committee on a regular basis (monthly or bi-monthly);
- Regular communication paths and rapid communication paths when significant issues affecting the Aboriginal community (including archaeology) are uncovered;
- That the Applicant provides a minimum of 7 days' notice to all relevant stakeholders within the precincts, as well as community and emergency transport services that attend the precincts, should outside of planned hours of work be required, to enable a reasonable amount of time for stakeholders to make alternative arrangements where possible;

C65 The Community Engagement Strategy is to be submitted to the Secretary of the Department of Planning and Environment and the City of Parramatta prior to the commencement of construction works and be maintained and implemented through the construction stage.

C66 The Applicant is to establish the following Reference Groups:

- A Community Reference Group which includes a range of community members from across the route and includes a range of different types of rail users e.g. families with young children, those with a disability, tertiary students, commuters, the elderly etc.
- A business reference group that includes a good cross section of businesses.
- A Church Street working group given the high impact on business in this area.

C67 The Terms of Reference for the Reference Groups are to include the provision of advice on the business and community impacts of construction of the project and to advise of mitigation measures to avoid or minimise impacts where reasonable.

C68 The Reference Groups are to be given the opportunity to review and provide input into the development of the Community Engagement Strategy referred to above prior to its finalisation.

C69 Council is to be involved in the selection of members of the Reference Groups to ensure they are representative of impacted business and community groups along the corridor.

C70 The Reference Groups are to meet monthly and the high impact groups are to meet fortnightly during construction and when required.

C71 A copy of all public communications (digital or written) regarding progress of the light rail construction and operation is to be provided to Council no less than 5 business days prior

to release, to enable consistent and timely communications with the general public by Council;

C72 A bi-monthly update meeting is to be held with Council during the construction period to ensure timely communications and ability to respond to emerging issues with a collaborative and consistent approach

Aboriginal stakeholder engagement
Council recommends draft conditions of consent to ensure engagement with the Aboriginal stakeholder community throughout construction through the vehicle of the Community Engagement Strategy (refer to the recommended conditions of consent regarding the Community Engagement Strategy). Please also refer to the Archaeology section of this submission for additional discussion.

5.3 Social Impact during Construction

Environmental impacts and health
A specific concern is the health of those individuals with severe respiratory and other chronic illnesses living in or utilising the precincts for work, study, services, recreational or cultural activities could be significantly impacted by dust if it is not managed well or if there is a lack of timely information provided for the community to make decisions about their daily activities. Section 13 of the submission provides more detail relating to environmental impacts from the projects construction and operation.

Recommended Conditions of Consent

C73 The Applicant is to establish a communication portal with relevant NSW based respiratory health organisations and peak bodies (including Asthma Foundation NSW), as well as the NSW Ministry of Health in order to communicate to their members when potential dust generating activities are taking place during construction.

Homeless Community
Homeless people who are currently sleeping rough in areas that are designated for construction or construction depots may be displaced from their 'home' or neighbourhood, and/or may be exposed to construction noise, vibration, light spill and construction vehicle traffic and access diversions, which will be considerably disruptive and unpleasant. There may be homeless people who choose to sleep rough in construction sites where they will be exposed to significant risk of injury. The intention to develop a Homeless Engagement Strategy is noted and supported. Council recommends the following conditions of consent to ensure effective communication with the homeless community and service providers.

Recommended Conditions of Consent

C74 The Applicant is to attend every meeting (quarterly) of the Parramatta Region Homeless Interagency (PRHI) during the construction phase to provide an update on progress and planned activities / next steps, and to receive feedback from service providers 'on the ground' regarding any impacts or issues for homeless people or homelessness service providers resulting from the work.

C75 The Applicant is to develop a Homeless Persons Engagement Strategy in consultation with the Parramatta Region Homeless Interagency (PRHI) and Council, covering the whole of the Stage 1 area with specific focus in and around the Parramatta CBD and North Parramatta (including Prince Alfred Park).

C76 TfNSW is to fund an Assertive Outreach Officer for the period of construction to:

- build relations with homeless people and facilitate referral to services and supports,
- be the main contact with local food service providers,
- act as the link for the local homelessness sector with the light rail project, and
- support early identification of potential issues/ risks as well as options to solve matters before they escalate.

Key Community Services

There are a number of critical services who will likely be significantly impacted during construction. Mitigation strategies must be put in place to manage impacts on these receivers. Continuous operation of Government, Non-Government and Private Community Services and Social Infrastructure should be maintained.

In addition, during construction, the ease of access to services and infrastructure in precincts along the corridor by individuals and households must be maintained, including the general public, people with mobility difficulties, outpatients and visitors of hospitals, parents and their children in day care and primary and high school, tertiary students and staff of Western Sydney University and staff and clients of community services.

Recommended Conditions of Consent

C77 Prior to commencement of construction, the Applicant is to demonstrate the following local stakeholders have been communicated the construction schedule and expectations and have determined to their reasonable satisfaction how they will be able to continue their key services either on site or off site:

- all Places of Worship;
- all childcare facilities (long day care, family day care, preschools, OOSH);
- all Nursing Homes and Aged Care Facilities;
- Council Social and Community Services; and
- all schools and universities.

Employment opportunities

Construction of the light rail presents significant opportunities to promote employment and education for vulnerable communities through target setting in all construction contracts associated with construction. Council acknowledges that the most appropriate mechanism for implementation is through the contracts that TFNSW awards to any private contractor. It is Council's strong preference that the Parramatta Skills Exchange program be the main vehicle that light rail use to deliver on employment and education targets.

Recommendation

R36 The Applicant shall engage in the Parramatta Skills Exchange program which is a program involving a partnership between Council and TAFE. The proponent will be required to meet employment and training targets that will enable a percentage of the total workforce to comprise:

- Residents of the City and greater Western Sydney to work on the Project
- Apprentices, trainees and workers updating existing qualifications or workers undertaking a new qualification.); and
- Indigenous workers.

5.4 Social Impact during Operation

Pedestrian safety
Community safety during operation of the Light Rail is important, particularly where it interfaces directly with community, rather than being on a separate track. For this reason, Council has drafted a proposed condition of consent relating to ongoing education and training promoting safe use of the light rail.

Recommended Conditions of Consent

C78 That the Applicant provides education and training sessions for the community to promote safe interaction with Light Rail, in partnership with relevant local organisations along the corridor, including:

- School students;
- People with a disability utilising services;
- Residents;
- Workers; and
- General public sessions.

Crime Prevention and Security
While crime prevention and CPTED issues have been broadly considered, a number of stops along the route, particularly Westmead and within the Parramatta CBD should be considered as crowded spaces along with light-rail carriages themselves. This means they will need to be risk assessed in accordance with *Australia's Strategy for Protecting Crowded Places from Terrorism 2017* which was released by the Federal Government on 21 August 2017.

Closed Circuit Television (CCTV)
Since 2015, the City of Parramatta has been building an extensive High Definition Public Space CCTV system called "Citysafe" throughout Parramatta CBD with some temporary cameras located in Westmead. The City has invested $5m in capital works and infrastructure including grant contributions from the Federal Government.

The EIS considers integration between Light Rail systems and Council systems where possible. This is a sensible approach as Citysafe and Light Rail CCTV are likely to be operating in close proximity to each other, and in the event of an incident it is important that operators are able to access adjoining cameras to track offenders and direct police accordingly. This can be accomplished by ensuring that Video Management Systems are compatible and agreeing to share camera access between Light Rail and Citysafe.

Better integration and cost savings can be achieved by co-locating monitoring facilities and sharing operational costs. The City of Parramatta operates a Citysafe control room staffed by trained operators across six days per week. The facility could be expanded to incorporate extra monitoring stations dedicated to Light Rail monitoring and either staffed by Light Rail operators or operated by Citysafe operators as a service to Light Rail on a cost recovery agreement with Light Rail. Either approach could provide substantial savings to both organisations and provide maximum leverage of capital and operational investment.

Alternatively, if Light Rail chose to operate a monitoring facility independently, there is an opportunity to switch operations between the two sites to provide for failover and disaster recovery in the case of one site being disabled.

Likewise, co-ordinating installation of conduit and other services such as lighting along the Light Rail corridor will benefit both organisations and potentially reduce capital costs.

Recommended Conditions of Consent

C79 The Applicant must conduct protective security risk assessments in accordance with *Australia's Strategy for Protecting Crowded Places from Terrorism 2017* and propose suitable treatments to mitigate identified risks. This is in addition to any general CPTED assessments conducted, although there may be commonalities in treatment options.

C80 The Applicant is to consult with Council to identify how best to integrate public safety systems such as CCTV to provide better coverage and situational awareness.

C81 The Applicant and Council should also consider sharing CCTV monitoring facilities to reduce capital and operational costs and assist both parties to meet their obligations under *Australia's Strategy for Protecting Crowded Places from Terrorism 2017.*

5.5 Affordable Housing

The EIS states that the light rail project will result in improved housing affordability. However, it is considered that the light rail's macroeconomic impact in the corridor will actually be to *increase* property values, and higher property values tend to be at odds with improving housing affordability. Therefore, it is considered that, without appropriate intervention, the likely outcome of the light rail project would be that housing in the corridor becomes *less* affordable, rather than more affordable, as land near to the light rail becomes more attractive due to connectivity and other benefits. However, the light rail project – mainly through the significant planning control changes anticipated in its corridor – represents a significant opportunity to use policy levers to effect positive change to housing affordability in Greater Parramatta.

As outlined in Council's recently-published *Affordable Housing Discussion Paper*, the new development potential associated with Light Rail is a major opportunity to help deliver the affordable housing target for City of Parramatta, and to ensure that the benefits of growth associated with the light rail project are shared equitably. (The Greater Sydney Commission's *draft West Central District Plan* also acknowledges the link between better transport and the opportunity of increased housing yield.) The potential to up-zone land along the light rail route means that Council can leverage the uplift value of these renewal sites to capture value for the benefit of the community. As outlined in Council's draft Planning Agreement Policy, Council will seek to secure 50% of the total uplift value of rezoned development projects, with a fifth of this (or 10% of the total uplift value) captured value being allocated towards affordable housing.

Council's draft Affordable Housing Policy identifies the significant need for affordable housing across City of Parramatta LGA and builds on the research undertaken on this issue that was published in the aforementioned Affordable Housing Discussion Paper. Based on current rates of renting as a proportion of total housing tenure, and current levels of rental housing stress experienced in the City, the City will require 9,500 affordable rental dwellings over the next 20 years to mitigate housing stress. Current provision of affordable rental housing stock makes up only 1% of the City's total housing supply. This is a very low provision rate and it further highlights the need for increased supply.

Subject to the adoption of Council's draft *Affordable Housing Policy*, City of Parramatta will work with Department of Planning and Environment (DPE) to deliver on its affordable housing target. The planning system mechanism that will be pursued to achieve the affordable rental housing target will be inclusion within SEPP 70. This inclusion allows councils to mandate an affordable housing levy on development rather than simply relying on the voluntary planning agreement process.

Recommendation

R37 That the Department of Planning and Environment, in consultation with Council, identify Affordable Housing opportunities in the Priority Precincts along the Light Rail corridor.

5.6 Economic Impact Modelling

There is a lack of economic impact modelling to determine the impact of construction on the local economy. While the EIS notes specific changes arising from the Project and the potential implication of these on businesses, there is no economic analysis of this impact on the local economy and businesses. The extent of the impact has not been considered quantitatively through loss of employment, tourism and GDP for the local economy, particularly the retail and hospitality industries.

Council considers this a vast omission of the EIS. Council has undertaken some desktop calculation of the economic impact of the Project during the construction phase. The most conservative scenario has forecast a reduction of an estimated $432 million per annum for three years and a total of 1,564 jobs.

Recommended Conditions of Consent

C82 The applicant is to undertake an Economic Impact Modelling Assessment to determine the range and extent of the potential negative impacts within specific business precincts along the Project corridor.

5.7 Impact on Small Business

The negative impacts of the light rail construction period will most significantly be felt by small business rather than larger business and tenants over landowners, particularly small business that are service-focused and rely heavily on foot traffic.

Ethos Urban has been commissioned by Council to prepare a Business Activation Strategy (the Strategy) for the Parramatta Light Rail (the Light Rail), to mitigate the negative impacts on local businesses associated with the construction of the Light Rail.

The construction of light rail infrastructure, although it will stimulate economic development and regeneration along the route, will be uniquely impactful on local businesses during the construction phase. Some of these impacts include: disruption to roads and streets and ground level; the loss of on-street car parking; disruption to operational arrangements and delivery access; and a general reduction in amenity for shoppers, workers, residents and visitors (including noise, dust and obstructions to pedestrian movement).

The preparation of the Strategy will ensure the impacts on businesses can be proactively managed. The objectives of the Strategy are to:

- Address the critical issues identified from desktop research and consultation;
- Provide clear budgeted items that demonstrate where and how money should be spent to support local businesses;
- Ensure businesses feel supported prior to, during and after the Light Rail construction, and business closures are minimised;
- Encourage people to continue to use places along the route, so they remain active and safe environments; and
- Keep stakeholders informed prior to, during and after the Light Rail construction.

The Strategy will be used to identify potential projects & initiatives which could help mitigate the negative impacts of construction and funding that is required, and will be implemented in collaboration with Transport for NSW (TfNSW).

Council welcomes the recommendation within the EIS of a Small Business Owners Support Program and Business Management Strategies specifically focused on small business.

Recommended Conditions of Consent

C83 The Applicant is to prepare a Business Management Plan, detailing relevant plans and programs that specifically address economic impacts and provide costed business continuity strategies for the commercial centres on the corridor, particularly the Parramatta CBD. The Plan should be prepared in consultation with Council, affected stakeholders, the Business Reference Group and the Church Street Working Group. Ongoing implementation of the Plan should be also done in consultation with these groups.

5.8 Communication and Engagement with Businesses

More thorough work on potential mitigation measures for construction impacts is needed. The assessment of construction impacts and operational impacts is considered, however there seems to be little detail what these measures may look like. The EIS references a future "Business Management Plan", with minimal detail on what is included, who is responsible for delivering it, and no indication of when it will be completed or how it will be communicated to existing businesses. The EIS does not discuss business promotion, local area activation and precinct activation as well as business engagement throughout the construction phase.

Recommended Conditions of Consent

C84 The Applicant shall provide a Construction Management Plan to detail how construction works will be managed in order to minimise impacts to existing businesses located in the vicinity of construction sites and activities during construction of the Light Rail. The plan shall include measures to minimise business related impacts, maintain vehicular access and pedestrian access during business hours and maintenance of the visibility of the business appropriate to, its reliance on such. The Plan shall be prepared in consultation with the Business Reference Group and Council and shall include, but not necessarily be limited to:

- Business management strategies for each construction site (and/or activity) identifying affected businesses and associated management strategies including employment of place managers and specific measures to assist small business owners adversely affected by the construction:
- A monitoring program to assess the effectiveness of the measures including nomination of performance parameters against which the effectiveness of the measure will be measured
- Provision for reporting the monitoring results to the Secretary of the Department of Planning and Environment of the Compliance Tracking Program.
- Implementation of a regular research program. Quarterly surveying of businesses to understand impacts on businesses and to identify opportunities for improvement and to be able to respond to issues. Survey to include satisfaction with communication and engagement and impact on business such as loss of parking, financial and access issues. This information is to be shared with Council and key stakeholders including business reference groups.

5.9 Construction Staging

Construction should be staged in order to minimise construction impacts. The EIS does not provide detail on the program of construction works and consider the option of staging the works. Given the recent experience of the Sydney CBD and South East Light Rail project, consideration should be given to staging the construction, to best reduce the transport and construction impacts on the local economy. It would be essential to consider staging the construction along Eat Street (Church Street) to avoid the potential failure of this prominent street.

Recommended Conditions of Consent

C85 The Construction Management Plan (CMP) is to include a staging plan. The staging plan is to be prepared in consultation with Council and relevant parties. The staging plan and CMP should specifically address issues relating to business and events, particularly in the Parramatta CBD. Where possible, construction activity along Eat Street is to be staged in short sections so as to avoid works during key event and festival periods, or extending festivals and events to surrounding streets to encourage footfall along Eat Street (Church Street). Additionally, the design of the construction and hoardings (i.e. utilising transparent barriers to maintain sightlines across the street) is to be sympathetic to the area.

5.10 Key Institutions

Council also notes the specific and varied needs of different businesses and institutions on and around the light rail route, including major operators and revenue generators for the State economy such as Western Sydney University, University of New England, Westmead Hospital and Rosehill Gardens Racecourse. There is no indication on how the Applicant will partner with these businesses to ensure negative impacts are managed as best they can.

Recommended Conditions of Consent

C86 Prior to Commencement of construction, the Applicant is to prepare detailed economic impact mitigation and management measures which are tailored to key institutions, such as Western Sydney University, University of New England, Westmead Hospital and Rosehill Gardens Racecourse and reflects a detailed understanding of respective needs and potential impacts.

5.11 Eat Street Economic Impacts

Outdoor dining will be completely removed from Church St (and other CBD locations) for two years under the current proposal. This needs to be very clearly stated in the EIS and needs to include the likely impact that this will result in closure of businesses and therefore permanent changes to Eat Street.

Consultation with other councils on their experience with light rail revealed that main strips where light rail hoarding is erected experience high rates of business closure and failure. There is a lack of consideration in the EIS of prominent food and retail strips being at risk of failing, particularly Church Street “Eat Street”.

Construction works along the alignment need to be staged in short sections to minimise disruption and mitigate the high impacts to local businesses. On Church St in particular, construction staging should be undertaken block by block. No construction fencing or space restrictions in the public domain should be undertaken until 48 hours prior to work commencing.

Recommended Conditions of Consent

C87 The Applicant shall erect construction hoarding or fencing along Church Street no more than 48 hours prior to commencing works in order to minimise the impact on the public domain and business operations. That the use of construction fencing will maintain sightlines across the street.

5.12 Impacts on Events

Light rail construction will disrupt key events sites including Centenary Square, Prince Alfred Square and the Parramatta CBD generally. Key events in these locations are described in the Table 3 below. There is a need to negotiate viable event site options to maintain a vibrant and functioning CBD.

Table 3: List of key events within Prince Alfred Square, Centenary Square and the Parramatta CBD

Location	Event
Prince Alfred Square	Sydney Festival (January) Parramasala Festival (March) ANZAC Dawn Service (25 April) Winterlight Festival (July) Riverside Theatres programs bump in and bump out via Market Street
Centenary Square	Lunar New Year Festival (February) Live and Local live music event (May) Parramatta Lanes Festival (October) Christmas in Parramatta event (November) Parramatta Farmers Market (every Friday) Food truck activation (weekdays throughout the year)
Parramatta CBD	Parramasala street parade – Church Street (March) Live and Local live music event (May) Parramatta Lanes Festival – various laneways (October) Western Sydney Wanderers – Pre-game marches ANZAC pre-Dawn Service march from RSL to Prince Alfred Square via Church Street (25 April) Other on request celebratory or commemorative parades or marches through the city – Church Street

The EIS indicates that the Applicant will consult major event organisers to minimise impact on events during construction. Clarification is needed as to the mechanism, timing and format of this consultation. A staging plan may also be of assistance in managing these (and other) impacts.

Furthermore, the Applicant, in collaboration with Council and the Sydney Coordination Office, should consult with other state agencies and major institutions including the Parramatta Park Trust, Venues NSW, the Museum of Applied Arts and Sciences, and the Australian Turf Club to develop strategies for the easy and safe movement of event related and non-related traffic around events. Preliminary planning should be done in tandem with the design, and implementation should begin at the beginning of construction.

Church Street is traditionally used for special events, street parades and marches. During construction and operation of the Project, it is unclear the alterative arrangements for these events and the subsequent traffic impacts of any alternatives.

Co-operation with light rail to coordinate services during events is required. Furthermore, any catenary wire in the Parramatta CBD is of particular concern given the potential to limit height of activity for parades and events.

Recommended Conditions of Consent

C88 That the Applicant include the process to engage Council and other major event organisers as part of the Construction Management Plan.

5.13 Operational Hours

Parramatta's night time economy is expected to grow significantly as it assumes a role as Sydney's Central City, with more people attending Parramatta in evening hours and more venues with later operational hours. In addition, many institutions along the corridor operate either 24 hours, 7 days a week or long hours including the Westmead Hospital precinct and Western Sydney University (Rydalmere and Parramatta CBD campuses).

It is important that transport options align with patronage needs relating to the night time economy. By comparison the Sydney Light Rail operates 24 hours per day and Gold Coast Light Rail offers a service every 30 minutes until 5:30am on weekends.

In addition, there are social advantages for operating longer hours, these include the reduction in alcohol-related crime due to affordable transport options out of the city (instead of opting to drive and lingering the Parramatta CBD). Light rail corridor offers activation and perceptions of safety as there will be constant through traffic on those streets. It is noted that Church Street was closed to traffic during the 1980s and reopened in 2007 due to the increase in crime and decrease in public safety perceptions.

Recommended Conditions of Consent

C89 That the project operational hours be 24-hours, 7 days a week, at a frequency that is compatible with the type of workers and visitors along the corridor.

5.14 Tourism Impacts

Parramatta's expected visitor economy growth target of overnight visitors is 2% per annum. North Parramatta development as a tourism/visitor precinct in the future needs to be included as part of the assessment in the EIS, as well including Parramatta Square, Civic Link, the Riverside and Museum of Arts and Applied Science (MAAS) developments in the Parramatta CBD and Rosehill/Camellia masterplan (particularly relating to a key focus to grow the Business Tourism sector) Western Sydney Stadium and Rosehill Gardens.

Council is concerned with the potential loss of coach parking and impact to group travel to/from hotels. There is very limited coach parking in the Parramatta CBD, and international tourism is increasing. Coaches are currently parking on Church St in front of the Parramatta Heritage & Visitor Information Centre on Church St, as well as in Market St.

Recommendation

R38 The project needs to clearly demonstrate no net loss of coach parking in the Parramatta CBD as a result of the light rail project. The economic modelling should undertake capacity analysis for expected growth in the tourism sector.

6.0 Property and Development Impacts

6.1 Subdivision

The EIS comments that there will be a number of residual pieces of land as a result of the construction of the EIS and that subdivision is to be included. There is insufficient detail to understand what the subdivision might look like. It is clear from the EIS that it is intended that these residual pieces of land could be repurposed for other uses once the light rail is constructed. A condition should be included in relation to a subdivision plan so that the size and location of these residual lots can be established. A strategy for dealing with any small or undevelopable lots should be established with potential landscaping or other public domain solutions. Long term maintenance and ownership of these areas needs to be established.

Recommended Conditions of Consent

C90 Prior to Commencement of Works, the Applicant is to prepare in consultation with Council a subdivision plan which clearly addresses the size, location, ownership and future use of any residual lots. The plan is to incorporate a strategy for dealing with any small or undevelopable lots with landscaping or other public domain solutions, including plans for long-term maintenance.

6.2 Development Sites

The status of many Development Applications and Planning Proposals referred to in the EIS has progressed since the time of its writing, and will continue to progress as assessment of the EIS continues. There needs to be ongoing coordination between Council and the Applicant to ensure appropriate outcomes are achieved. A key concern is the coordinated delivery of public domain, as the approval of Development Applications may occur ahead of the Project's detailed design in some cases. As discussed elsewhere in this submission, construction timing is also a key issue in terms of cumulative impacts.

Recommended Conditions of Consent

C91 That the Applicant implement a system which involves Council to ensure ongoing coordination with proximate Development Applications and Planning Proposals, including construction coordination, public domain delivery, traffic impacts and other matters.

6.3 Directly Affected Properties

Properties at Tramway Avenue/Grand Avenue

Sydney Water owns a boat ramp within the concrete-lined channel between Tramway Avenue and Grand Avenue. The channel is owned by Sydney Water (in terms of the physical asset), however, Council owns the land. Access to this boat ramp should not be removed.

Furthermore, access to adjacent Lot 102 DP840898 (aka 32 Tramway Avenue, immediately to the south) cannot be denied, as Tramway Avenue is that property's only legal and physical access point.

Recommended Conditions of Consent

C92 That both physical and legal access to the Sydney Water boat ramp and to Lot 102 DP840898 is maintained throughout construction and operation. If physical and legal access to Lot 102 DP840898 cannot be maintained, the Applicant must acquire the property.

Lot 1 DP 126881

This property is impacted by the proposed alignment. This property is within Queens Wharf Reserve and was granted to Council for use as a public wharf, and for no other purpose.

Recommendation

R39 That the Applicant partially acquires Lot 1 DP 126881 from Council.

Properties bounded by Arthur, Alfred and George Streets, and Tramway Avenue

There are a group of residential properties bounded by Arthur, Alfred and George Streets, and Tramway Avenue which have vehicle access from the rear (i.e. from Tramway Avenue). While legal access will be maintained to those property's frontage to George Street, practical issues arising from vehicle access conflicts along Tramway Avenue need to be resolved.

Recommendation

R40 That the Applicant resolve vehicle access issues to properties bounded by Arthur, Alfred, and George Streets, and Tramway Avenue.

Outdoor Dining Leases and Awnings

Council is concerned that impacts on outdoor dining and businesses at Church Street ("Eat Street") have not been adequately addressed. Business engagement is discussed in more detail in Section 5 of this submission, however, there are also property-related considerations arising from these impacts as well.

With regard to acquisition and lease cessation process, the EIS states that TfNSW are bound by NSW government legislation to act according to specific procedures when acquiring property. The legislation encourages the acquisition of land by agreement rather than by compulsory acquisition wherever possible. Through this process, all impacted businesses and commercial property owners will receive fair and reasonable compensation for their loss, including the costs associated with obtaining professional legal and valuation advice and relocation expenses (where possible). Council believes that discussion between TfNSW, land owners and lease holders should also include Council as a crucial stakeholder.

There are numerous outdoor dining structures situated primarily along Church Street and within the road reserve which will require removal and subsequent replacement by the Applicant. Further to this, building awnings are constructed along a number of streets along the proposed alignment. The preliminary design shows construction access from building line to building line and may require removal and subsequent replacement of awnings by the Applicant.

Recommendation

R41 The Applicant must provide further information regarding procedures for the cessation of outdoor dining licenses. In particular, it must be clarified how TfNSW will engage with business owners regarding Outdoor Dining licenses and the impact of the Light Rail Project.

R42 The Applicant must provide further information regarding procedures for the removal and replacement of outdoor dining structures and building awnings by the Applicant, including cost and consistency with the agreed design.

6.4 Property Acquisition

It is noted that the Project requires either full or partial acquisition of a number of properties, as summarised in the Table 4. However, these numbers do not clearly align to the number of properties highlighted on the relevant EIS maps. This should be clarified; for instance, it is noted that the EIS states that these numbers reflect "land and interests in land where identified"

(emphasis added). It should be clarified if some of the numbers summarised below in fact reflect multiple interests in the same property (rather than multiple individual properties).

Table 4: Summary of property acquisition outlined in the EIS

Land Use Type	Full acquisition	Partial Acquisition
Mixed-use	16	11
Residential	21	34
Commercial	-	8
Industrial	3	11
Infrastructure	2	28
TOTAL	**42**	**92**

It appears that most affected properties would be partially acquired, with many involving acquisition of a strip of property frontage to allow for widening of the road reserve, construction of Light Rail stops or intersection upgrades. This would generally not impact on buildings and would not require the relocation of residents or businesses. However, some properties require total acquisition for the project, including residential uses of varying densities and commercial uses. Residents and businesses of these properties would be required to relocate prior to construction. Some temporary leases of land would also be required during construction for site compounds and other work sites.

Required properties would be acquired by TfNSW in accordance with the provisions of the NSW Property Acquisition (Just Terms Compensation) Act 1991 and the Land Acquisition Reform 2016 process. It is understood that consultation with affected property owners has already commenced. It is not known whether Council needs to be involved in any agreements between TfNSW and the affected landowners or subsequently, regarding the ongoing use of the land.

As discussed above in Section 6.3, Lot 102 DP 840898 has been identified as a property that may need to be acquired and the determination should reflect this.

Recommendations

R43 The Applicant is to provide further information clarifying the number of properties which are to be acquired (such that the maps and tables presented in the EIS are clearly aligned).

R44 The Applicant is to advise whether Council is required to be involved in any land acquisition agreements or subsequently, with regard to the ongoing use of the land.

Recommended Conditions of Consent

C93 That the Applicant, in consultation with Council, develops and implements a Property Acquisition Engagement Plan, including a dedicated Property Acquisitions Manager role.

6.5 Land Subject to Aboriginal Land Claim

It should be noted that Robin Thomas Reserve (Lot 7048 DP 93899) is currently subject to an Aboriginal Land Claim. The Aboriginal Land Claim was lodged by the NSW Aboriginal Land Council on 7 October 2009 (Claim No. 21129 File Reference: 09/13918). The City of Parramatta Council has completed an assessment outlining why the land is not claimable Crown Land as it is lawfully used and occupied and is needed for an essential public purpose. The outcome of this claim may have implications for the Light Rail alignment at Harris Street/Robin Thomas Reserve.

Recommendation

R45 That the Applicant continue to liaise with Council and the NSW Lands Department regarding the Aboriginal Land Claim at Robin Thomas Reserve.

6.6 Project Relationship to Council Assets

Council is concerned that RMS is to be the main body approving road-related details. This is not an acceptable approach, especially with regards to Council assets. Council must be a key and main stakeholder in all design and construction works, both on- and off-alignment, particularly for all works relating to Council's road and footpath assets. Council's design requirements and standards must be met for any modifications to kerbs, gutters, bridges and other Council assets. Council is also concerned that no set boundaries between RMS and Council's assets have yet been defined, and the assets handover process at the Project's completion requires significant planning.

Recommendation

R46 That there is clear definition between RMS and Council's assets and infrastructure, including responsibility for design checks, conditioning and maintenance works;

Recommended Conditions of Consent

C94 That the Applicant include Council as a key and main stakeholder in all design and construction works on and off alignment in similar capacity as RMS.

C95 That, prior to construction, a dilapidation report is required for:

- Existing Council assets including roads, footpaths, and drainage;
- Existing buildings (private and commercial) that will be within construction zone and affected by vibration at construction stage and operations;
- Any heritage buildings and other structures, as above.

C96 That the Applicant include Council in handover of relevant assets and infrastructure upon completion of the works

C97 That road opening permits are sought from Council where required.

6.7 Road Pavements

The Environmental Impact Statement (Volume 1 and Volume 2) and associated documents do not include adequate detail on existing and proposed road pavements. Sections 6.6.1 and 6.6.6 describe road pavement works associated with the light rail project in general terms only.

Sections 5.8.1 and 5.8.2 respectively describe changes to the road network directly associated with Light Rail, and off-corridor changes. Both sections indicate that there will be major changes to the existing road network including significant road pavement works. Associated documents provide details on existing and expected traffic conditions at main road intersections. However, no such analysis is provided for changes to existing road pavements. Council recommends that the Applicant conduct pavement investigation and testing and prepare a Pavement Design Report that will provide information on existing pavements and changes (reconstruction, upgrade, strengthening, adjustments etc.) that will be required. The detailed Pavement Design Report should be agreed with Council as the owner of infrastructure assets that will be affected by the light rail project and responsible for future maintenance.

Section 6.6.1 of the EIS states: "removal of existing road pavement and subgrade (where required) for the light rail tracks; preparation of track base and for binding layer; placement of reinforcement steel (where required)". The impact of this on existing road pavements along the corridor must be assessed and pavement designed and adjusted for full road width; this may include full depth reconstruction of existing pavements. It is important that road pavements adjacent to rail tracks structure are compatible with the structure to prevent differential settlements, ingress and accumulation of moisture in pavement layers at the interfaces due to

differences in permeability, stiffness etc. The Pavement Design Report must include full road cross sections for each different configuration.

Section 6.6.6 of the EIS states: "The road network would be modified in numerous locations (particularly around intersections) to accommodate the track infrastructure [and] to ensure the road surface ties into the new track and the grade is sufficient to provide suitable drainage. These works would involve milling the road surface and laying new asphalt…In some areas, the profile of existing carriageways may be modified to tie into the light rail alignment. This would require the existing asphalt carriageway to be milled and a new surface laid to the relevant grade". In doing this, the load bearing capacity must not be reduced; e.g. it is not acceptable to reduce thickness of structural pavement layers (for example, it is not acceptable to mill 100 mm and place back only 50 mm). In these situations, the road pavement must be reconstructed to its full depth to provide required capacity to bear traffic loads.

Recommendation

R47 That, in consultation with Council, the Applicant conduct pavement investigation and testing and prepare a Pavement Design Report that will provide information on existing pavements and changes that will be required. The report must include:

- the proposed pavement structure for each road section or part of the road section along the corridor and off-corridor road sections that will be affected by the Project;
- discussion of each element of the pavement design system shown in Figure 2.1 of Austroads' Pavement Design Guide (project reliability, construction and maintenance considerations, environment, subgrade evaluation, pavement materials and design traffic);
- full road cross sections for each different configuration;
- demonstration that the load bearing capacity of roads are not reduced; and
- all background data (e.g. traffic surveys and studies, geotechnical investigation, field and laboratory testing etc.), assumptions and calculations in the design process and nominated construction specifications.

6.8 Bus Shelters

The Light Rail Project works will require substantial relocation of bus shelters and repair and recreation of other bus transport facilities. The Light Rail must meet the full costs of these works.

Recommended Conditions of Consent

C98 The Applicant is required to carry out a survey and prepare a plan and detailed design, satisfactory to Council, of all bus and related facilities that are affected by the Light Rail Project, including a proposal for replacement, reinstatement, and/or restoration (as necessary) of these facilities. This is to be implemented prior to commencement of operation of the Light Rail.

6.9 Construction Impacts on Local Schools

The EIS does not demonstrate how access will be maintained to schools in a safe manner. Sturt Street is a proposed access road to the rail corridor from Kissing Point Road which will affect Telopea Public School and Waratah Montessori Preschool. With regard to Dundas Public School, the bus replacement service would operate via Park Road and Calder Road. Calder Road and Station Street would also be used to access the Dundas Railway Station compound and rail corridor. It is noted that Arthur Phillip High School is being developed as a high rise school. It is unclear how the Light Rail construction will affect the redevelopment of the school, as well as how the school development may impact the Light Rail construction.

Recommendation

R48 That further information be provided to Council regarding how access will be maintained to schools in a safe manner and how Light Rail construction will affect the high-rise redevelopment of the Arthur Phillip High School, as well as how the school development may impact the Light Rail construction.

7.0 Heritage and Archaeology Impacts

7.1 Aboriginal Cultural Heritage

Council commissioned GML to undertake thorough assessment of Aboriginal Cultural Heritage matters in the EIS. Council provides a summary of that assessment below. Council is concerned that the assessment does not meet the SEARs. The following three key issues were identified regarding the EIS' approach to Aboriginal Cultural Heritage matters.

Scope of the Assessment

The Aboriginal heritage assessment has not adequately identified the range of Aboriginal historic, social or aesthetic values associated with the study area, or the potential impacts on these values arising from the Project. The assessment focuses predominately on Aboriginal scientific values, evidenced through archaeological objects presenting as stone artefacts. As such, the identification and assessment of cultural heritage values adhering to the OEH Guide (2011) and the Burra Charter are yet to be satisfied so as to comply with SEARs 9 (Heritage).

As another example relating to the assessment scope, Section 5 of the relevant technical paper includes no predictive statement or model as required under the Code of Practice (2010); no assessment of geotechnical studies across the wider study area has been undertaken, and it is considered that some assessments for roads through the Parramatta Sand Sheet/Parramatta Sand Body (PSS/PSB) zone would be useful. There is a database available online from other projects.

Despite the focus on Aboriginal objects, the study does not consider "contact" period archaeology and its significance at local, state or national levels for its ability to inform or challenge accepted understandings of colonial history and Aboriginal contact. Known or potential Aboriginal contact sites are not identified, assessed or subject to impact analysis, and the cultural values of such sites across Parramatta's historical landscape are not addressed. No historical research is presented on local Aboriginal people, places, or events, despite there being a great deal of information available and the fact that this study area crosses and includes land which was at the forefront of British–Aboriginal relationships, politics and decisions. No connections are drawn between events and places, and no mapping of the early cultural landscape (initial and consequential layout of Parramatta) and how this would have affected the local Aboriginal land use, their economy and society is presented.

Impacts to Robin Thomas Reserve

The 'Ancient Aboriginal and Early Colonial Landscape' (NSW State Heritage Register [SHR] Item 01863) (also known as the Robin Thomas Reserve) has been assessed to hold the highest level of significance attributable to an item in NSW, which includes historical (criterion A), associative (criterion B), social (criterion D), and research potential (criterion E) values. The SHR listing describes the item as the 'Parramatta Sand Body Conservation Area'.

The 'Ancient Aboriginal and Early Colonial Landscape' will be directly impacted by the Project, and SEARs Section 9.2 requires assessment of this impact. An assessment adhering to SEAR 9.2, and the cited heritage guidelines, is not presented for the state-listed Aboriginal heritage values of this item, despite 11% of the SHR curtilage being directly impacted. Furthermore, Robin Thomas Reserve should be identified as having *high* significance throughout the EIS (see for example Section 6.2.2 where Robin Thomas Reserve is designated as only holding *moderate* archaeological potential).

The built heritage and non-Aboriginal archaeological reports (Artefact 2017a and 2017b, respectively) have assessed the impact to *non-Aboriginal* heritage, and recommended that 'impacts within Robin Thomas Reserve be avoided where possible in order to retain its intact and significant cultural heritage and archaeological significance' (Artefact 2017b, p 137). Council considers that the Project should also mitigate and avoid impacts to the state listed *Aboriginal* values of this place, and detail the process of impact avoidance. The SEAR's desired

outcome requiring 'the long-term protection, conservation and management of the heritage significance' has not been realised, and attempts to avoid impact have not been demonstrated.

Archaeological Test Excavation

The Aboriginal archaeological test excavation that was carried out was not subject to the provisions of the *National Parks and Wildlife Act* and the *Heritage Act* under Section 89J (*Environmental Planning and Assessment Act 1979*). However, the excavation should have been undertaken in accordance with best practice, including consultation with representatives of the local Aboriginal community, and notification provided to the NSW Heritage Division of the identification of historical relics under Section 146 of the *Heritage Act*. Some identified Potential Archaeological Deposits have not been subject to sufficient test excavation to categorically confirm the absence of an archaeological deposit, and consideration of contact-period 'imported' material repurposed as Aboriginal objects (most often glass, ceramic and metal) has not been undertaken.

The assessment of Aboriginal archaeological potential has assumed that extant infrastructure (roads and services, notably to the south of the Parramatta River) has removed all intact expressions of the Parramatta Sand Sheet (PSS)/Parramatta Sand Body (PSB). The premise for this hypothesis has not been tested and large intact deposits of high value PSS/PSB may have been excluded from heritage assessment and, therefore, management.

Cultural Landscape

The assessment report focuses on physical archaeological sites only. However, there are a significant number of places, landscapes and aesthetics which are also connected including the Parramatta River, Parramatta Place, Parramatta Native Institute (symbolic), Old Government House and the Domain, original Parramatta layout and system of streets between OGH and the government wharf etc. These provide the basis of historical connection and association, which lead to social, aesthetic and historical value. Analysis of values for these places needs to be addressed in the report, with consequent impact assessment and management requirements. An overarching statement of significance should be developed.

A cultural landscape study should describe the whole of study area as a cultural landscape traversing the lands adjacent to the Parramatta River, moving from brackish water sources to fresh, the extent of the PSS and how the ecological landscape would have changed, resulting in significant alterations to available resources, which could have affected the presence of distribution of Aboriginal sites. A post 1788 landscape needs to be described, with detail on how colonisation forced Aboriginal people away from these significant traditional lands, but brought them back in through attempts at 'civilisation' etc.

Alongside the four main issues outlined above, Council is also concerned by numerous errors, inconsistencies and inaccuracies throughout the report, including for example:

- Section 3.1: How has the PSS/PSB been mapped for this project? Is this from Phillip Hughes' mapping? Statement that 'much of the original sand body is likely to have been destroyed' provides the basis for committing to conservation wherever possible, especially inside existing conservation zones.
- Section 3.4: No mapping of previous impacts with nil archaeological potential is presented.
- Section 5.1.4: This section details that glass artefacts were present at the Harris Street footpath near Robin Thomas Reserve. Contact period archaeology needs to be highlighted.
- Section 10: Assessment of cumulative impact (as required under the SEARs) is not provided. No discussion on reduction of impacts, attempts to avoid impact, or technical and engineering solutions designed to avoid impacts has been provided. No impact assessment of social, historical or aesthetic values is presented.

Recommendation

R49 That the Applicant, in consultation with Council, provide a revised Aboriginal Cultural Heritage assessment report which meets SEARs 9 (Heritage) by:

- Providing the test excavation methodology as an appendix to the assessment document.
- Undertaking further historical research and archaeological analysis, to determine the available extent of primary evidence related to the history of the area, including known and potential sites, persons and archives.
- Revising the heritage assessment to consider Aboriginal contact period history and the known and potential heritage values and archaeological evidence associated with places and locations within the rail corridor.
- Undertaking an assessment of the cumulative impacts of the project to Aboriginal cultural heritage, and the PSB/PSS, in accordance with best practice for cultural heritage, OEH policy, the objectives of the NPW Act, and SEARs 9.2.
- Demonstrating attempts to minimise harm to Aboriginal cultural heritage, the PSB/PSS, and notably the SHR item 01863., and provide methodologies to enable conservation and redesign prior to construction. Impacts to the PSB/PSS within the SHR curtilage should be avoided. If the project boundary cannot be altered, options for avoiding direct impact need to be explored. Given the extent of fill over the PSB in this location (KNC 2017, Figure 21), an assessment of engineering options should be made to avoid direct impact to the PSB, leaving it in situ below the proposed development.
- Revising the Salvage Excavation Methodology (Appendix E) to provide a context and justification for salvage extents and methodology, including defined start and end points, and the reasons for potential expansion. (KNC 2017, 90). Methodology should provide for more extensive salvage excavation in accordance with standard practice in NSW, particularly in areas of known significance, such as Robin Thomas Reserve.
- Revising the ARD to allow for mechanical excavation of the layer of fill across the PBS/PSS, which does not need to be hand excavated. This should be undertaken under the supervision of a qualified archaeologist.
- Providing specific methodologies for contact period archaeological sites in Parramatta, and the salvage excavation of other types of archaeological evidence present within the PSB/PSS, including ochre deposits, manuported stone (noting that any stone manuported within the sealed deposits was brought by Aboriginal people), hearths, ground ovens, and heating pits.
- Revising the methodology defining the program of scientific analysis, including geomorphology, with OSL dating, particle size analysis, and palynological analysis. Analysis and assessment of excavated assemblages of historical objects to determine their age and significance as potential contact period objects (under both Aboriginal and historical archaeological methodologies).
- Revising the methodology to provide a management and mitigation strategy that allows for archaeological testing to determine the presence of the PSS through parts of the study area (KNC 2017, Figure 2) which cannot be assessed at the current time (i.e. below existing roads) notably through the centre of Parramatta south of the river.

Recommended Conditions of Consent

C99 That, prior to construction, the Applicant shall prepare a Cultural Landscape Study for the light rail route encompassing the Aboriginal historic, social and aesthetic values. The study should include recommendations for acknowledgement and interpretation of significant Aboriginal cultural heritage values. The study should be completed within 12 months of the project approval, by a suitably experienced heritage professional with skills in Aboriginal historical research, community engagement, intangible cultural heritage,

oral history and cultural mapping. This study should contextualise the Aboriginal history and heritage values known to exist within the city of Parramatta, and should provide the scope for the recording of associated oral histories with members of the local Aboriginal community. The Cultural Landscape Study should inform the Interpretation Plan for the project, which should address integrate heritage values across the study area. These studies should inform the detailed design for the landscaping and urban design components of the project.

C100 That, prior to construction, the Applicant shall undertake consultation with Council as part of the Cultural Landscape Study to ensure consistency with internal strategies for heritage management and interpretation within the LGA.

C101 That, prior to construction, the Applicant shall undertake additional test excavation within PADs 3, 5 and 6. This can occur concurrently with the post approval mitigation (KNC 2017, Appendix E), which is required for PADs 1 and 2, AHIMS 45-6-3195 and, subject to impacts being approved within the SHR curtilage, the Robin Thomas Reserve.

C102 That, prior to construction, the Applicant shall undertake test excavations to identify the PSS through parts of the study area which cannot be investigated as part of the EIS, prior to the commencement of construction. Sufficient time and resources must be allowed for archaeological investigations to be completed in accordance with the ARD.

C103 That, during construction, the Applicant shall implement the revised methodology for the investigation of Aboriginal archaeological sites to be impacted by the project

C104 That, following construction, the Applicant shall prepare a final Aboriginal archaeological investigations report within 12 months of completion of archaeological fieldwork. The final report should be prepared to current NSW OEH standards and requirements. It should include, but not be limited to, detailed and illustrated description of archaeological findings, registers (features, photo, samples, plans), specialist reports, artefact catalogue and analysis, site photographs, interpretive illustrations, scaled drawings and surveys (including orthophotographs) and response to research questions. The final report should also include a digital archive of all site records including plans, photographs, high resolution orthophotographs, any 3D scans taken, monitoring notes and field notebooks. The final report should also identify the location and details of the long term storage for Aboriginal objects. The final report should be submitted to the City of Parramatta Research & Collection Services Area Library, the NSW OEH, and a suitable online repository as agreed by Council.

C105 That the Applicant consult with Council's Darug Reference Panel and Aboriginal and Torres Strait Islander Committee regarding Aboriginal Cultural Heritage matters in relation to the Light Rail Project.

7.2 Historical Archaeology

Council commissioned GML to undertake an assessment of the EIS' *Parramatta Light Rail—Non-Aboriginal Archaeological Assessment*, and a summary is provided below. Key issues are highlighted in following sections. Further work and draft Conditions of Consent are proposed to address the issues outlined herein.

Adequacy of Assessment

The key desired outcome of SEARs Issue 9 (Heritage) is that "the proposal facilitates the long term protection, conservation and management of heritage significance and avoids or minimises impacts on the heritage significance". Requirements 9.2c and 9.2d relate to these conservation outcomes, however, the report does not address these requirements directly or provide any mechanisms to achieve the conservation outcomes or impact avoidance, as follows:

- The report's purpose does not clearly relate to the SEARs, and does not respond directly to the SEARs outlined in Section 1.5. There is no mention of conservation management methodology as per best practices, or SEARs 9.2c and 9.2d.
- 9.2(c) "measures to avoid and minimise impacts in accordance with the current guidelines" - the report references Section 7.0 which does not provide any measures to avoid and minimise impacts; rather, it provides an outline of how to mitigate impact during construction.
- 9.2(d) "provide a set of heritage conservation principles underpinning the works including approach to material artefacts discovered during works, adaptive re-use and interpretation" - the report references Section 7.2 and 7.3. Section 7.2 does not provide any conservation principles. There is no Section 7.3.
- Requirement 9.2(e) is required and not addressed in this report. Section 1.7 lists four authors. No reference is made to whether the four authors meet the NSW Heritage Council's Excavation Director's criteria. The assessment concludes that archaeological excavation will be required as a mitigation measure, and therefore proposes archaeological excavations. To comply with the SEARs, the assessment must be undertaken by consultants who meet the criteria; this has not been demonstrated.

Furthermore, the methodology and level of analysis does not comply with NSW Heritage Division guidelines or best practice, and would not meet the requirements for an application to the NSW Heritage Division for an archaeological permit under the 'relics provisions' of the Heritage Act (as would be required if the development was being assessed by Council). Specific issues include:

- Section 2.4 (Methodology) does not reference the crucial *Assessing Significance for Historical Archaeological Sites and Relics* (Department of Planning, Heritage Branch, 2009). The methodology provided is for built heritage with no reference to assessment of historical archaeological sites, NSW historic themes and research potential. The archaeological assessment presented in Section 5.0 does not follow the methodology in Section 2.4.
- Terminology in Section 2.5 (Methodology) is not appropriate for historical archaeological sites or in line with best practice and Heritage Division guidelines. The methodology and terminology for assessing impacts should be adapted for archaeological heritage.
- Section 3.0 (Historical Context) does not include any primary/archival research, though the methodology for assessing archaeological potential (Section 2.3) says this has been undertaken. All references are secondary sources. Primary historical research is a key element in undertaking archaeological assessments.
- Section 3.0 (Historical Context) relies on a narrow range of online and printed sources. There are a large number of archaeological assessments for sites in the Parramatta area available at the NSW Heritage Division and local libraries. Reports for a number of current major developments can be sourced online from UrbanGrowth and Major Projects NSW websites. These reports would provide further historical sources and archaeological analysis relevant for this assessment area.
- Section 5.0 (Archaeological Assessment) a hybrid of detailed assessment (as per best practice) and inventory sheet. The separation of historical analysis and generic archaeological assessment lacks clarity and robustness. The legibility of the information presented in each of these Historical Archaeological Management Units (AMUs) would be increased if the report were restructured by precinct—to include historical analysis, assessment analysis, specific historic map overlays, specific impacts and management zone mapping.
- Section 5.0 (Archaeological Assessment) is not specific in relation to archaeological potential, relying on generic statements which appear to be 'cut and paste' in some cases. The assessed level of potential is presented in gradings explained in Table 2.2. However,

these assessed levels are often contradicted in the significance and impact assessments (for example, HAMU 8 and 10).

- The level of detail in the archaeological potential assessments in Section 5.0 (Archaeological Assessment) varies significantly between HAMUs of similar potential and significance. For example, compare HAMU 7 and HAMU 13. HAMU 13 is an example of inadequate archaeological assessment which does not provide any analysis to support the statements made and impact assessment regarding the first Parramatta Gaol and Female Factory site.
- Significance assessments in Section 5.0 (Archaeological Assessment) provide contradictory statements as to whether there is intact archaeology, as well as about the significance (state or local) of that archaeology. The purpose of the significance assessment is to assess the potential archaeological remains, as described in the archaeological potential section. The contradictions between the assessed potential and significance creates a confusing and inadequate analysis. Furthermore, this issue is present in most HAMUs; see for example HAMU 7.
- In Section 5.0 (Archaeological Assessment), no HAMU contains a statement of significance which identifies what potential archaeological remains are significant, and for what values, in accordance with the NSW Heritage Criteria as outlined in Section 2.4.2, Table 2.3.
- In Section 5.0 (Archaeological Assessment), impact assessments often contain contradictory statements regarding level of archaeological potential to those defined in Table 2.2 of the Methodology Section 2.0. Not all HAMUs provide an archaeological impact statement as required by SEAR 9.1 and 9.2(a). Level of impact is not provided in accordance with the terminology presented in Section 2.0, Table 2.5.

Management Measures

The management measures proposed are generic and assume archaeological impact mitigation during the construction program. There is no recommended mechanism for proactive archaeological conservation management as part of the design process prior to and during construction. The report does not provide an adequate framework for identifying significant and intact archaeological sites of local or state significance, redesigning to avoid impact and conserving in situ; all significant and intact archaeology should be retained in situ as first principle of conservation and best practice archaeological heritage management. The assessment methodology does not address lessons learned from the approach taken to assess and manage the CSELR, and does not consider the challenges of design and construct linear projects.

HAMUs

Council is concerned about generic and unclear treatment in most HAMUs in the report. Broadly, the issues are summarised below, however, Council is also able to provide more detailed feedback as part of revising the assessment (refer to Recommendations below):

- Impacts are considered generically in many instances
- Need for more specific management and mitigation measures in some areas
- Some HAMUs lack statements of significance
- Contradictory statements about likely extent of excavation in some areas
- Contradictory statements about likely potential of archaeology in some areas

Other comments

There are numerous other issues, inconsistencies and inaccuracies throughout the report; examples include: Section 1.3.4, Table 1.1: These relate mostly to built and landscape heritage; it should be identified where potential historical archaeological impacts were considered and redesign undertaken in response.

- Section 2.2.2 and Table 2.1: The order of the management measure element sis not appropriate. For example, heritage induction is given to contractors before an ARD is prepared.
- Section 2.6: Heritage Interpretation guidelines have not informed the mitigation measures for historical archaeology presented in Section 7.0
- Section 4.2: A register of Parramatta Historical Archaeological Landscape Management Study (PHALMS) AMUs within the study area should be included. These are used by Council as a planning tool and should not be ignored for an SSI project.
- Section 5.0: the legibility of information presented on each of the HAMUs would be increased if the report were restructured by precinct to include historical analysis, assessment analysis, specifics overlays, specific impacts and management zone mapping.
- The terms “management” and “mitigation measures” have been interchanged throughout the report; these terms have different meanings and should be reflected accurately.

Recommendations

R50 That the Applicant provide a revised Historical Archaeology Assessment to meet the SEARs by:

- Undertaking further historical and archaeological analysis, including primary research, comparative analysis, detailed archaeological assessment and historical map overlays. Include discussions regarding contact archaeology in the assessments.
- Revising the assessment to address the numerous contradictions and inconsistencies between the methodology and terminology presented in Section 2.0 and the archaeological impact assessments presented in Section 5.0, and within the assessments in Section 5.0.
- Incorporating assessments and results from key projects such as Parramatta North Urban Transformation (PNUT), Arthur Phillip High School (APHS), Endeavour Energy’s transmission upgrades and Kelleher Nightingale Consulting’s (KNC) Aboriginal heritage report (in particular the testing results) for this project. These reports and information are available online (UrbanGrowth and Major Projects websites) and through the Heritage Division library and the City of Parramatta Research Services Library at 346a Church Street, Parramatta. They could also be requested from the consultancies who prepared them.
- Reviewing the level of significance for archaeological sites dating to the 1840s in Parramatta North. Current understanding is that archaeological remains relating to early nineteenth-century development north of Parramatta River are of state significance.
- Revising management measures and zones to include more specific procedures for Historical Archaeological Management Units (HAMUs) with state significant and/or intact archaeology. Prince Alfred Square, Queens Wharf Reserve and Robin Thomas Reserve should be maintained as conservation areas. These should have specific management recommendations to promote conservation outcomes as required by the SEARs (9.2 (c) and (d)).
- Revising management measures to include specific principles and policies for design and for construction, as two different processes, which link to key archaeological sites and HAMUs (in particular the state significant sites). The management measures should also consider the different stages and components of the Light Rail Project, such as early and investigation works, which occur as prior to construction.

Recommended Conditions of Consent

C106 That, prior to construction, precinct-based Archaeological Research Designs must be prepared (rather than one document for the entire project). This would allow for more

detailed archaeological impact analysis and specific archaeological management and methodologies. The ARDs should include methodologies to enable conservation and redesign prior to construction, detailed archaeological investigation methodologies in accordance with best practice and also include specific methodologies for contact period archaeological sites in Parramatta. The ARDs should be submitted to the NSW Heritage Division for approval prior to construction.

C107 That, prior to construction, archaeological test investigations must be undertaken at state significant HAMUs and key locally significant HAMUs prior to finalising design and construction commencement. The results should inform construction methodology options to avoid impacts to state significant and intact locally significant archaeological sites. The redesign process should include consultation with the NSW Heritage Division and Council.

C108 That, prior to construction, an Interpretation Strategy is prepared in consultation with Council, NSW Heritage Division, Aboriginal stakeholders and other key stakeholders. The Interpretation Strategy should adopt a cultural landscape approach and include archaeological findings. The Interpretation Strategy should identify opportunities in the design to incorporate interpretation, such as at stops or within carriages.

C109 That, during construction, the archaeological mitigation methodologies of the non-Aboriginal Archaeological Research Designs for each precinct shall be implemented.

C110 That, during construction, an Interpretation Plan which includes detailed content and design shall be prepared in conjunction with the Project design team. Detailed content and concept designs should be approved by Council's interpretation specialist and the NSW Heritage Division. The Interpretation Plan should provide details of how interpretation would be implemented.

C111 That, following construction, a final non-Aboriginal archaeological investigations report shall be prepared within 12 months of completion of archaeological fieldwork. The final report should be prepared to current NSW Heritage Division standards and requirements. It should include, but not be limited to, historical analysis, detailed and illustrated description of archaeological findings, Harris Matrices, registers (context, photo, samples, plans), specialist reports, artefact catalogue and analysis, site photographs, interpretive illustrations, scaled drawings and surveys (including orthophotographs) and response to research questions. The final report should also include a digital archive of all site records including context sheets, plans and section drawings, photographs, high resolution orthophotographs, 3D scans, monitoring notes and field notebooks. The final report should also identify the location and details of the artefact repository. The final report should be submitted to the City of Parramatta Research & Collection Services Area Library, the NSW Heritage Division library and a suitable online repository as agreed by Council.

7.3 Impact on Built Heritage

Adequacy of Heritage Assessment

Council believes that the EIS Technical Paper 10 - Built Heritage Assessment is inadequate and does not follow the detailed guidelines of the NSW Heritage Council Statements of Heritage Impact for each individual heritage item. Rather the assessment provides a 'bulk' assessment utilising precinct summaries, and overly general and non-specific mitigation measures. Although Council appreciates the large scope of the project, it is still considered that more detail is needed for many, if not majority of heritage items. This is also a requirement set out in Section 9 of the SEARs.

The proposed mitigation measures in the Built Heritage Assessment should be revised and improved, for example:

- Lack of commitment to where wire free design will occur stating *"a wire free design would be considered during the detailed design phase to minimise visual impacts on heritage items."* The word 'considered' indicates that there is no certainty that wire free design will be implemented in any areas. This uncertainty in relation to mitigating impacts on key heritage items and areas at the planning stage is unacceptable.
- The Assessment states *"an appropriately qualified and experienced heritage architect would provide independent review periodically throughout detailed design."* Notwithstanding the lack of Council involvement in this proposed process, the word "periodically" indicates that there is no certainty regarding the degree of influence of even such, Applicant-engaged, architect.

Recommendations

R51 That the HIA be revised to meet the relevant SEARs and the NSW Heritage Council Guidelines in relation to mitigation measures for heritage items, in particular for:

- Lennox Bridge
- Cumberland East Hospital Precinct
- Prince Alfred Square
- Robin Thomas Reserve
- Dundas Station

Recommended Conditions of Consent

C112 Prior to construction, all relevant requirements under NSW Heritage Act and NSW National Parks and Wildlife Act, as appropriate, are to be satisfied.

C113 Any historical fabric which may eventually be approved for damage or destruction is to be archivally recorded, and records deposited in the Parramatta Heritage Centre.

Royal Oak Hotel and Stables

The EIS Built Heritage Impact Assessment (Technical Paper 10), indicates that the Royal Oak Hotel and Stables is earmarked for demolition as follows:

> *"The proposed project alignment would require road widening along Church Street fronting Royal Oak Hotel and stables. This would require removal of the main building of the Royal Oak Hotel to allow for the road widening and alignment at the intersection. It is understood the rear stables building of this item would be retained. The removal of the main building within the 'Royal Oak Hotel and stables (and potential archaeological site)' would result in a major direct impact to the heritage item. Much of the heritage significance and heritage fabric would be lost. While the item would still meet the threshold for local significance under the criteria, revision of its heritage curtilage on the Parramatta LEP would be required."*

Built around 1831, the Royal Oak is a key local landmark, one of the oldest and finest examples of 19th Century architecture in Parramatta. It is of special importance to local residents and the identity of the area, and its potential loss cannot be mitigated by any means. The demolition would result in a cultural loss of this local attraction.

The NSW Heritage Council Statements of Heritage Impact Guidelines require a set of questions to be addressed in the process of assessment of heritage impact. These include:

> *"Proposed Change to Heritage Item: Demolition of a building or structure*
> - *Have all options for retention and adaptive re-use been explored?*
> - *Can all of the significant elements of the heritage item be kept and any new development be located elsewhere on the site?*
> - *Is demolition essential at this time or can it be postponed in case future circumstances make its retention and conservation more feasible?*

- *Has the advice of a heritage consultant been sought?*
- *Have the consultant's recommendations been implemented? If not, why not?"*

The EIS and Technical Paper do not respond to the NSW Heritage Council Statement of Heritage Impact Guidelines. The EIS deems the proposed impact as "major" and admits that it will lead to destruction of the item.

Council recognises the constraints of delivering Light Rail through this section of Church Street, as it is a narrow section of roadway due to the protrusion of the Royal Oak Hotel. Council requests that the Applicant present any investigation work undertaken which considered the preservation of the Royal Oak Hotel.

Abutments of Camellia (Parramatta River) Underbridge and Clyde Carlingford Bridge

The EIS outlines that the Project requires demolition of the Camellia underbridge abutments (southern and northern sides). All of the heritage significance would be removed and the item would therefore no longer meet the threshold for local significance and likely be removed from the Parramatta LEP 2011 and RailCorp s160 listings. The reasons for removal outlined are to allow for double track across the bridge and that the *"abutments currently have no structural purpose and optioneering analysis has concluded that the abutments would need to be removed for the successful functioning of the Parramatta Light Rail."*

Council requests that the Applicant consider an alternative scheme, one which would allow ongoing retention of the heritage items, as per the NSW Heritage Council Guidelines (noted above). While it does briefly mention options, the HIS does not offer a satisfactory response to this question. An option for this bridge which may be pursued by the Applicant is to raise the existing bridge to avoid demolition of the abutments. It is noted by Council that this option would have cost and property impacts because the heightening of piers within Parramatta River and pose substantial construction risks. However, it is considered fair at this stage of the assessment process for the Applicant to articulate all costs and benefits of this and the currently proposed option.

Recommendations

R52 That the Applicant investigate and present to Council and DPE alternatives to avoid the demolition of the listed heritage items Royal Oak Hotel, abutments of 'Camellia (Parramatta River) Underbridge, and abutments of Clyde Carlingford Bridge.

R53 Where the Applicant cannot avoid demolition of the Royal Oak Hotel, any remaining property (including the Stables) that is not required for ongoing operation of the project shall be converted to public domain, dedicated to Council and incorporate heritage interpretation.

Lennox Bridge

The EIS indicates that there will be a visual and, importantly, possibly a structural impact on the Lennox Bridge - *"investigations are being undertaken to confirm that Lennox Bridge can safely carry light rail services."* Lennox Bridge is a heritage listed item in Parramatta LEP 2011 and the State Heritage register. It is one of Parramatta's most important historic structures, and one of the earliest bridges in New South Wales and Australia. It is therefore absolutely necessary to confirm that the Lennox Bridge can, and will, be able to carry light rail in any and all conceivable extreme conditions, for an undefined and unlimited period of time, without any noteworthy damage.

In addition, Council is concerned in relation to the adverse visual and heritage impact that any overhead wires will have on the Lennox Bridge. The EIS identifies *"opportunities for wire free operation of the project are being investigated, which would further reduce the visual and infrastructure impact on Lennox Bridge."* As detailed elsewhere in this Submission, the use of wire-free technology is critical for this section of the route.

Recommended Conditions of Consent

C114 Prior to construction, that the Applicant engage a suitably qualified person to undertake a structural adequacy assessment during the construction and operation of the project on Lennox Bridge.

7.4 Impact on Heritage Parks and Places

A number of significant public parks will be impacted by the light rail during both construction works and ongoing operations, including Prince Alfred Square, Queens Wharf and Robin Thomas Reserves. While not a park, the Project will also impact on St. Patrick's Cemetery. These places are of high heritage significance; all being listed on the State Heritage Register (with the exception of Queens Wharf Reserve), whilst also providing important open space for the increasing surrounding residential population. The design and location of the light rail route (and associated infrastructure) needs to minimise impacts on the fabric of these important heritage parks, particularly a reduction in the occupation of increasingly scarce open space, and the need for tree removals.

The use of overhead catenary wires along the edges of these heritage parks will result in significant impacts and will likely require additional pruning of nearby retained trees. Some retained park trees may also require pruning to allow for access for construction activities or for clearance from other required infrastructure. Installation of below ground infrastructure will also potentially impact significant archaeology and require pruning of roots of retained trees, which are also at risk of soil compaction. Construction and excavation activities will need to reduce the potential for soil compaction and be located to minimise impacts on park assets and public access. Any replacement tree plantings or other public domain works will also need to reflect the heritage character and significance of these parks.

The installation of fencing and other barriers along the interface with public parks will result in significant visual impacts as well as restricting access and permeability. However, it is acknowledged that barriers will be required in some locations due to safety requirements.

Prince Alfred Square, War Memorial, Gollan Clock and St Peters Church and Hall

The EIS fails to address the impact of the proposed Prince Alfred Square Stop on the state heritage listed park including the War Memorial and Gollan Clock. It has the potential to significantly encroach into the Victorian era square layout of the park, have major visual impacts, result in a noteworthy archaeological impact and reduce the overall size of this highly used public space. It is acknowledged in the EIS that the War Memorial is retained, however this is an absolute imperative and must be conditioned.

Prince Alfred Square was recently added to the State Heritage Register (SHR). It is representative of an intact square or public park layout from the Victorian era, embellished in the Edwardian, inter-war and post-war eras, enriched with tree plantings some of which date from the mid Victorian period (c.1869-70s). It was also the site of Parramatta's second gaol (1804 - 1841), first female factory (1804-1821), a village green since 1837 and has exceptional archaeological research potential. The Square has associations with notable people, including Governors Phillip, Hunter, King and Bourke, the Reverend Samuel Marsden, and events including the Castle Hill Rebellion. The SHR Inventory concludes that *"the Square with its collection of monuments and mature trees are dominated by surrounding (State and Local heritage) sandstone churches and C19th schools which provide a high quality urban precinct evocative of the various periods of development of Parramatta."*

St Peters Church is a stone church designed by architect Thomas Rowe, built by local builder and stonemason George Peters, and largely financed by John Fairfax (who laid the foundation stone and was a prominent congregation member). Council is concerned in relation to the visual

impacts of a light rail stop across from St Peters, and the electrical lines spanning the sky in this locality.

Therefore, it is recommended that the light rail, including the stop at Prince Alfred Square be sensitively designed to minimise the impact on the surrounding State and locally listed items (refer recommended Draft Conditions of Consent below).

Impact on Queens Wharf and Robin Thomas Reserves

The EIS and supporting Technical Paper indicates that there will be visual, archaeological, and other impacts on the Queens Wharf Reserve. Trees are proposed to be destroyed, stating that:

> *"…the road reserve is not wide enough to accommodate the light rail infrastructure and traffic lanes without impinging on Queens Wharf Reserve or the northern edge of Robin Thomas Reserve. Therefore strip impacts were not able to be avoided."*
>
> *"Due to the sensitive archaeology within Robin Thomas Reserve, particularly along the northern section, strip impacts on Queens Wharf Reserve were considered to have a lesser heritage and landscape impact."*

The proposal outlined in the EIS implies removal of trees, however, insufficient detail is provided to assess the impact of these actions in detail. It is noted that Robin Thomas Reserve was a site of an orchard for a number of years, and it is presumed that some trees in the Queens Wharf Reserve are related. In addition, the exact location of a number of key items, for example, the early wharfs and Barracks, is not fully known, and thus it cannot be assumed that it is safe to disturb the grounds and remove "some of the trees" in the Queens Wharf Reserve.

Impacts to Robin Thomas Reserve are discussed further in Section 2 of this Submission.

Grave of Eliner Magee and Child

It is of concern that the EIS states that the project alignment will be adjacent to the Grave of Eliner Magee and Child and the project alignment would encroach into the heritage curtilage of this item. The Grave of Elinor Magee and Child is dated 1793, and is believed to be the oldest known European grave in Australia. Elinor Magee and her un-named child drowned in the river and were buried in the vicinity of the accident site, indicating a major event for the first Europeans in their new country. Importantly, that is the oldest known Australian grave with a name of the interred person and the circumstances of death. The EIS states that "the proposed works would result in a minor impact to the Grave of Eliner Magee & child" however there are no specifics provided in relation to this impact.

Thus any impact on the item of this degree of sensitivity must be scrutinised with greatest care, and, given the nature of the item, it is absolutely necessary to ascertain the detail and nature of that encroachment. Any approval of the Light Rail Project should be conditioned with avoidance of the grave with a protective buffer area provided around its curtilage.

St Patrick's Cemetery

The EIS inadequately addresses the potential impacts on St Patrick's Cemetery (oldest Catholic Cemetery in Australia), as it incorrectly assumes that the current fencing along Church Street corresponds with the historic cemetery boundary. This fencing was moved from the original boundary to its current location to allow for the bus lane along Church Street. The light rail works will therefore potentially impact burials located along the western boundary of the cemetery.

Recommended Conditions of Consent

C115 That the project be designed, constructed and operated wire free from its commencement at Westmead through to corner of Factory and Church Street at North Parramatta, and at Victoria Road from Parramatta CBD to Tramway Avenue Light Rail

Stop, Rosehill (as per Section 4 of this submission). Wire free sections of light rail along the interface of St Patricks Cemetery, Prince Alfred Square, Queens Wharf Reserve and Robin Thomas Reserves are required to minimise visual impacts and tree pruning.

C116 The Prince Alfred Square Stop shall be designed to ensure impacts on the heritage listed items are minimised including:

- Designed so to not impact the historic geometry of the park.
- Protection of historical structures, including the War Memorial and trees during works;
- Minimise use of fencing and other barriers; and
- Minimal signage, with fully transparent shelters to minimise visual intrusions.

C117 Prior to construction, detailed investigations are required to confirm the location of burials along the western boundary of the state heritage listed St Patricks Cemetery to ensure that the proposed works will not result in any significant impacts.

C118 Prior to construction, a detailed design is required for St Patricks Cemetery, Prince Alfred Square, Queens Wharf Reserve and Robin Thomas Reserves which minimises the use of fencing and other barriers along the interface of these spaces to reduce visual impact and maximise pedestrian permeability and universal access.

C119 That the Project avoids the Grave of Eliner Magee and Child with a protective buffer area provided around its curtilage. The Project shall allow a reasonable separation between the route and the item.

C120 Prior to works commencing, Condition assessments are to be prepared for all assets and infrastructure on open space land in consultation with Council. Assessments are to include furniture, soft and hard landscaping, heritage structures, turf and tree condition, paving / pathways, signage, fencing, gates and lights.

C121 To minimise impacts on St Patricks Cemetery, Prince Alfred Square, Robin Thomas Reserve and Queens Wharf Reserve, a Landscape & Temporary Works Management Plan must be prepared and implemented as part of the Construction Environmental Management Plan. It is to ensure that:

- Excavation and trenching are to be minimised;
- Site sheds and other temporary works facilities are to be installed above existing grades to prevent soil compaction;
- Laydown and loading areas are to be located away from trees to avoid the need for tree pruning and reduce risk of soil compaction;
- Vehicle access to work sites shall be located away from mature trees as much as possible;
- Rehabilitation and landscaping of impacted areas following completion of works.

C122 Site specific tree protection plans shall be prepared and submitted to Council for approval in accordance with AS 4970:2009 (Protection of Trees on Development Sites) for the following public spaces:

- St Patricks Cemetery
- Prince Alfred Square
- Robin Thomas Reserve
- Queens Wharf Reserve

8.0 Sustainability Impacts

8.1 Sustainability Strategy

The EIS states that the Project has developed a Sustainability Strategy with goals and objectives to be reviewed, updated and delivered throughout the project. The Strategy has not been provided with the EIS documentation.

Recommendation

R54 That the Applicant provide the Sustainability Strategy, as drafted, to the Council for review as part of the EIS process.

Recommended Conditions of Consent

C123 That, in the consultation with relevant agencies and Council, the Applicant prepare a Sustainability Strategy for the construction and operation of the Project.

8.2 Energy and Emissions

The City of Parramatta Environmental Sustainability Strategy (2017) sets carbon emissions reduction and renewable energy targets. The Strategy recognises that in order to meet these targets, new development and major projects must commit to energy efficiency and renewable energy solutions for the benefit of our community.

Council seeks to ensure that this project emulates and improves on previous similar transport infrastructure project commitments for the Sydney CBD and South East Light Rail and South and North West Rail Link by offsetting emissions and pursuing renewable energy options.

Currently, the project aims to achieve a minimum 65 or excellent rating under the Infrastructure Sustainability Council of Australia (ISCA) accreditation and offset greenhouse gas emissions from the operation of the Light Rail.

The EIS does not provide clear quantifiable outcomes in relation to energy savings targets nor greenhouse gas emissions reductions apart from offsetting emissions at the operational stage. In addition, the emission inventory does not include maintenance equipment use, maintenance transport, minor vegetation removal (pruning), street tree removal and waste generation and materials used for maintenance. Therefore, it is difficult to determine the level of accuracy of the emissions inventory for the Project.

Recommendation

R55 That the Applicant provide to Council for review as part of the EIS process:

- Assumptions used to generate the Greenhouse Gas Emissions (GHG) modelling for the construction and operation of the Parramatta Light Rail
- The score card and total points to achieve an “excellent” rating under the ISCA scheme.
- The Project’s response to the NSW Government Resource Efficiency Policy (GREP) requirements.
- The Project’s response to the NSW Climate Change Policy Framework and its renewable energy and climate resilience targets.

Recommended Conditions of Consent

C124 The Project must achieve a minimum 65 or “excellent” rating at the design, as built and operation stages.

C125 The Applicant shall comply with Transport for NSW's Sustainable Design Guide Version 4 and achieve a minimum gold rating for this State Significant Infrastructure.

C126 The Project at a minimum offset all GHG emissions from its operation.

C127 The Sustainability Strategy must include a GHG emissions plan in consultation with Council for the lifecycle of the project construction that includes:

- All GHG emissions from the Project
- Setting best practice energy efficiency, greenhouse gas emission and renewable energy targets at the construction and operation stages of the Project.
- The renewable energy target should match Council's 50% renewable energy target for the operation of the Light Rail project including the use of photovoltaic cells at the stabling and maintenance facility and installation of small scale solar and LED lights at all rail stops, energy efficient design of buildings above minimum NCC standards, within the stabling and maintenance facility).
- Procurement must demonstrably address:
  - energy efficient rolling stock and maintenance equipment (such as air conditioning, ventilation fans with smart temperature set points, insulation and weight considerations for rolling stock).
  - Energy efficient electrical equipment as per GREP and meeting the minimum improvement for operational energy for buildings as per the GREP.
  - Use of construction equipment/plant that is fuel efficient and can run on biofuels
  - Use of low embodied energy and recycled materials at light rail stops.
- Evaluation and reporting on the feasibility of identified opportunities be carried out during detailed design and documented in an energy and greenhouse gas strategy.
- Remaining GHG emissions (from gas and other fuel sources if any) be offset using GreenPower
- Establish a monitoring and public reporting framework for resource consumption and GHG emissions.

8.3 Urban Heat

Over the last four decades the number of days over 35 degrees in the Parramatta CBD has nearly doubled (from an average of 7.3 to 13.5 per annum), from a high of 24 days over 35 degrees in 2009. It is critical that heat mitigation is considered in the design and construction of the Project to ensure that firstly new infrastructure does not exacerbate urban heat, and secondly that, through smart design, users of the light rail system can seek respite from extreme heat conditions through provision of shade and shelter.

Council has undertaken thermal imaging to better understand the issue of heat in our LGA.[2] These thermal imaging indicates that even at night urban areas do not readily shed heat gained during the day.

From the EIS it is unclear what mitigation and response strategies are proposed in relation to urban heat and climate change impacts. These include materials selection needs to factor in more extreme heat events that may result in materials perishing or failure unless selected with extreme heat in mind. A design to cope with more intense (if less frequent) rainfall and hail events without incurring damage to infrastructure is recommended.

Recommended Conditions of Consent

[2] http://coolparramatta.com.au/heat_maps

C128 The Applicant must incorporate climate change adaptation in the Sustainability Strategy for the project. The Strategy shall specifically address:

- The risks of urban heat during construction and operation phases
- Provision of natural and artificial shading and cooling devices in and around stations to improve pedestrian and light rail user comfort
- Disruption to operations caused by heat related passenger illness.
- Address how infrastructure and materials associated with the Project is future proofed for a 50-year horizon taking into account predicted climate change such as increased rainfall intensity, flooding events, urban heat, extreme heat days, heatwaves, wind gusting, and severe storms.

8.4 Water

With the population increase across the City of Parramatta, by 2038 potable water consumption will increase by 50%. The City's Environmental Sustainability Strategy outlines a goal of no net increase in potable water consumption by 2038 (from 2015 levels) and to meet this will look at water efficiency and alternative water sources. To meet this target new development and infrastructure projects need to commit to strong water targets.

The EIS does not commit the project to water efficiency and use of alternative water sources.

Recommended Conditions of Consent

C129 That the Applicant include in the Sustainability Strategy:

- Potable water and alternative water supply targets;
- Consider high WELS ratings for all water using appliances;
- Rainwater harvesting and recycled water infrastructure at the stabling and maintenance facility to provide non-potable water supply for, at least, toilet flushing, carriage washing and irrigation. A recycled water pipeline currently exists close to the stabling facility which could meet all the non-potable water demand at the facility;
- Water monitoring, via a comprehensive metering/sub-metering scheme; and
- Transparent reporting of mains potable and recycled water usage in the operational phase

C130 Where available, and when of appropriate chemical and biological quality, subject to a health risk assessment, stormwater, recycled water, and groundwater inflows to tunnels or other water sources shall be used in preference to potable water for construction activities, including concrete mixing and dust control.

8.5 Waste and Resource Management

Council considers that the construction, operational and maintenance waste streams are appropriately addressed in the EIS in terms of alignment with State Government targets and experience with the Sydney CBD and South East Light Rail projects.

Recommended Conditions of Consent

C131 DPE should reflect standard Conditions of Consent for waste and resource management for the project.

C132 All Light Rail Stop facilities are to have general rubbish bins and recycling bins.

9.0 Flooding and Water Quality Impacts

9.1 Flood Modelling

Accurate and detailed flood modelling is required to enable effective responses to both river flood events and overland flow. Council has commissioned an independent peer review of the Applicant's flood model for the Light Rail route; the results of this peer review will be forwarded to DPE in December 2017 as an addendum to this submission. However, in the interim, Council raises concern with respect to the flood model, and requests that the Applicant undertake further detailed work to finalise the modelling prior to the determination of the EIS. Recommended conditions relating to these details are below. Council is particularly concerned that the current Project model references a "Draft 9 MIKE 11 flood model" for the Upper Parramatta catchment. This is an unauthorised version of a previous Council adopted "Draft 8 MIKE 11 flood model", and should not be used for this study.

Recommendation

R56 City of Parramatta Council has not adopted the Draft 9 MIKE 11 flood model or reports. Only the formally adopted Draft 8 model and its outputs should be used for this study.

Recommended Conditions of Consent

C133 All newly created results of survey work, models, model outputs or asset inventory data are to be provided to Council for its use as they are generated.

C134 The Applicant must prepare and submit to DPE and Council a detailed, comprehensive hydraulic flood model that includes the impacts of both mainstream (fluvial) flooding impacts from Parramatta River and its tributaries, local overland (pluvial) flooding from local catchments, and hydraulic stormwater drainage pit and pipe model for all drainage infrastructure impacted by the Light Rail project. The model must include the following:

- a review of all previous flood study information obtained from Local Land; Services to ensure it is consistent with Council's adopted flood information results Draft 8 MIKE 11, released by the Upper Parramatta River Catchment Trust;
- pre- and post-development catchment study scenarios which include the Light Rail network and structures, and other known significant developments proposed in the catchment;
- the modelled impacts of all new, modified and existing PLR infrastructure including form loss coefficients for bridges;
- the impacts of climate change and sea level rise;
- all scenarios based on new AR&R 2016 methodology, confirm peak design flows and adopt the high result for use in final design of the drainage and overland flow network;
- accurate topographic survey;
- overland flow modelling for the 1% AEP and the PMF pluvial and fluvial events assuming 100% pit and pipe or bridge blockage at critical locations;
- extended building polygons data include the Carlingford sub-catchment;
- all missing pit and pipe stormwater drainage information (the collection of this information is to be undertaken by a Registered Surveyor and must include all stormwater drainage inlet pit capacities, and a detailed hydraulic grade line analysis that takes appropriate account of all hydraulic pit losses, pipe losses, pit and pipe network geometry and tail water conditions); and

- a calibration of the flood and drainage model using historical flood events and rainfall information.

9.2 Project Design and Flood Risk Levels

Nearly all of the Light Rail route is affected by flooding, either by rising waters from Parramatta River, Clay Cliff Creek and other tributaries, or by overland flow in the sub-catchments from major rainfall events. Some of the route is subject to high-hazard flooding in a 1% event, and most of the route is submerged in a Probable Maximum Flood (PMF). Given the spatial extent and likely longevity of the Light Rail system it is virtually certain that the system will be subject to significant flooding during its existence.

Therefore, the design of the Light Rail infrastructure is crucial in mitigating flood risks on the service and also on neighbouring property. Council requests conditions of consent regarding design and operation of the Project to minimise risk and maximise safety during flooding events. Council is concerned that the flood assessment does not adequately address SEARs 10 (flooding), in particular the performance requirements of Council's guidelines referred to in the *Current Guidelines* column of the SEARs.

Recommendation

R57 Prior to determination, the Applicant must submit a redesign of the stabling and depot facility at Camellia to provide flood protection for all flood events up to and including the PMF. This must allow for major flood flow conveyance under the building structure(s) without obstruction, and must minimise flood impact. No filling of the site or the surrounding access areas is to be undertaken.

Recommended Conditions of Consent

C135 Prior to commencement to works, the Applicant clearly respond to SEARs 10 (Flooding), and demonstrates that all relevant flood-related planning and development controls have been addressed under *Current Guidelines* including:

- Local Floodplain Risk Management Policy;
- Local Environmental Plans (LEPs);
- Development Control Plans (DCPs);
- Lower Parramatta River Flood Study and Management Study and Plan;
- Adopted Upper Parramatta River Flood Study and Management Study and Plan;
- Draft Update of Parramatta Floodplain Risk Management Plans; and
- the NSW Floodplain Development Manual.

C136 Prior to commencement of works, Applicant must submit to Council and DPE final detailed flood modelling and design which demonstrates the following:

- the Project will not materially adversely impact on existing flood characteristics (such as flood inundation extents, alterations to flood flows and velocities, changes to flood levels or hydraulic flood hazard flow conditions) along the full extent of the project or elsewhere outside of the project boundary for all flood events up to and including the PMF.
- the effective protection of all critical rail infrastructure components for all flooding by adequately addressing:
  - daily operational requirements during typical rain events;
  - localised flooding in events of 5% to 1% AEP; and
  - extreme flood events greater than the 1% AEP up to and including the PMF.

C137 The Applicant must investigate and report on further advice stated in AR&R 2016 and other industry accepted recommended guidelines on acceptable safe levels of hazard flow criteria, and appropriate considerations made in final design of the Light Rail Project.

C138 The Applicant must clearly address and mitigate issues at all areas where the current flood modelling reports increases in flood depths, in particular;

- Caroline Street (Westmead Precinct) – increase in water levels of up to 200 mm in a 1% AEP event
- Road within Cumberland Hospital (Parramatta North Precinct) – increase in water levels up to 160 mm in a 1% AEP event.
- Ross Street / Sorrell Street (Parramatta North Precinct) – localised increase in water levels up to 100 mm in a 1% AEP event.
- Victoria Road (Parramatta North Precinct) – localised increase in water levels up to 170 mm in a 1% AEP event.
- George Street between Purchase Street and Alfred Street – (Rosehill and Camellia Precinct) – increase in water levels at private properties of up to 80 mm in a 1% AEP.
- Rydalmere stop (Carlingford Precinct) – increase in water levels western side of up to 400 mm in the 0.2EY event.
- Leamington Road pedestrian underpass (Carlingford Precinct) – increase in peak water level of approx. 400 mm in the 1% AEP event.
- Adderton Road north of Kissing Point Road intersection (Carlingford Precinct) – increase in peak water level of approx. 180 mm in the 1% AEP event.
- Winter Street (Carlingford Precinct) – increase in peak water level of approx. 180 mm in the 1% AEP event.
- Adderton Road south of Cumberland highway (Carlingford Precinct) – increase in peak water level of approx. 400 mm in the 1% AEP event.

9.3 Emergency Planning

It is inevitable that substantial parts of the Light Rail will be shut down in severe storms and flash floods, and sophisticated operational management techniques will be required to keep passengers and staff safe. Council is concerned that these have not been adequately addressed in the proposal, and it is essential that an approach to operational risk management which takes into account the full range of flooding risks is demonstrated to at least concept viability stage prior to approval of the EIS.

Council is concerned that the EIS proposes insufficient monitoring of water levels. The current proposed approach in the EIS is for individual drivers to visually gauge water depths and take appropriate actions; this is considered an inadequate response. Any measure that controls the reduction in services for flood safety reasons should be automated and managed by the control room in a strategic, whole-of-service approach.

Recommendation

R58 Prior to determination of the EIS, the Applicant must prepare to concept viability level an appropriate and coordinated approach to emergency response and risk management due to flooding, during both operation and construction. This is to be done in consultation with Council and SES.

R59 The Project is to utilise appropriate monitoring devices and connect to the latest local flood warning system (FloodSmart) which provides timely data and allows the greatest possible response time in a flash-flood event. Becoming part of the FloodSmart program will allow

the Project to identify additional flood triggers and better respond to flood events. While the EIS includes a Stormwater and Flooding Management Plan, it is recommended that Council be consulted on this to ensure that all issues – including flood monitoring and warning systems - have been addressed appropriately.

Recommended Conditions of Consent

C139 That, two years prior to operation, Applicant must prepare a detailed and comprehensive Flood Emergency Response and Operational Risk Management Plan and accredited Management System for the entire Light Rail system addressing at a minimum:
- emergency planning during construction and repairs
- anticipation and preparedness for significant flood events
- flood warning systems
- LRV emergency movement planning
- staff training
- passenger/staff protection, evacuation and rescue

C140 In consultation with SES, Council and any other relevant emergency authorities, the Applicant must demonstrate that the design of the network is consistent and integrated with all other emergency plans and emergency response agencies.

C141 Water level sensors are to be placed at key flood locations to automatically monitor water levels. These must be coordinated from a central control room, and data from these sensors is to be made available to Council and SES to assist with flood management.

C142 All emergency response, or change in service due to flood risk or other emergency, is to be coordinated from the control room and not left to individual drivers.

C143 Light Rail operations must sign up to the FloodSmart (FISH) local Parramatta early flash flood warning service, and the operator must consult with the Parramatta River Flood Information System steering group (to gain access to automated partner alerts, review the effectiveness of warnings, etc.).

C144 The Applicant is to consult with Council on the Stormwater and Flooding Management Plan to ensure all issues have been addressed appropriately.

9.4 Stormwater, WSUD and Water Quality

Council is concerned that the EIS approaches stormwater and water quality at a minimum compliance level, as opposed to an integrated, holistic manner in keeping with global best practice. The Project represents a major opportunity to advance the City's goal of bringing swimming back to the Parramatta River, however, the water quality report sets targets to a 'baseline' of pre-development conditions rather than aiming to decrease pollution levels entering our waterways. This is contrary to best practice, undermines Council's strategic goal of rendering the Parramatta River swimmable, and does not comply with Council's development controls. The Project inadequately applies Water Sensitive Urban Design (WSUD) principles, meaning that the economic, environmental and social outcomes expected by the community are at risk of not being successfully delivered. At the very least, the project should conform to Council's DCP controls and meet local water quality goals and metrics, including those outlined in Council's *Environmental Sustainability Strategy* and by the Parramatta River Catchment Group (rather than the standard ANZEEC water goals).

The water quality assessment report also focuses largely on water quality management at intersections of the Light Rail track with watercourses; this proximity-based approach does not demonstrate effective catchment management. As all stormwater eventually drains to a

receiving waterway, stormwater management should be integrated into the *entire length* of the track, in a sensitive, sustainable manner. An integrated WSUD approach to manage the quality, quantity and amenity of water runoff across the whole Project must be established.

Council's DCP requires the use of landscape-integrated "green infrastructure" water management measures, as these provide social, environmental and economic benefits that proprietary treatment units do not. This approach is also supported by extensive publications by the CRC for Water Sensitive Cities, and by the *NSW Sustainable Design Guidelines v3: Sustainable Water Management.* With this context in mind, Council submits that WSUD should not be addressed by proprietary filtration units, as such measures offer no ancillary social or environmental benefits and pose a significant maintenance burden. Instead, all pollution-reduction modelling and calculations should be conducted with landscape-integrated measures which deliver sustainable, resilient, liveable and water-sensitive infrastructure. Measures suitable for this project include bio-retention swales, gardens and tree-pits, vegetated trackways and green wall technologies at stations. Vegetated trackways (a technique common in Europe) consist of thick mats that contain various species of hardy, low-maintenance vegetation. Benefits of landscape-integrated WSUD measures include:

- Mitigation of urban heat island effect through increased evapotranspiration.
- Provision of ecological pathways, linking different green areas in and around the city
- Biodiversity protection through provision of habitat and native vegetation
- Stormwater quality treatment through infiltration
- Reproduction of natural water-cycle regimes
- Good urban design and amenity outcomes
- Flood mitigation through increased retention and detention of stormwater runoff.

If further filtration is desired in excess of the DCP targets, then pre-fabricated filtration units may be proposed in addition to the landscape measures. However, it should be understood that proprietary filtration units and bio-filtration measures are not substitutable.

Recommendations

R60 The Applicant must consider the requirements of Council's *Draft Best Practice Urban Design in Flood Prone Areas – Urban Design Strategy* (2016, prepared by Architectus and Cardno) into all relevant aspects of the project, as required by the SEARs. This document will be provided to the Light Rail Project team by Council.

R61 Further detail about how operational water quality impacts from the stabling facility at Camellia will be managed is required, as this facility is a large impervious area where maintenance activities could result in surfactants, oils, heavy metals, and other toxic chemicals being released into waterways during routine operations, and also during major floods.

R62 The Applicant must demonstrate to concept viability level an approach to WSUD across the Project which conforms to Council's DCP requirements and meets local water quality goals and metrics, such as those outlined in Council's *Environmental Sustainability Strategy* and by the Parramatta River Catchment Group.

Recommended Conditions of Consent

C145 That the Applicant prepare an interdisciplinary Water Sensitive Urban Design Strategy for the entire Light Rail Project, which is implemented through detailed design and addresses:

- water quality improvement, ecological services, landscape values, social amenity and flood resilience
- commitment to the implementation of all WSUD measures suggested in the EIS, which form a basic sustainable water management strategy.
- integrated landscaping, bio-retention and grassed/vegetated track areas to maximise pervious surface and deep soil area.
- vegetated trackways must be maximised. Pervious trackways in the form of permeable pavement should be used where vegetated trackways are not feasibly achievable. Areas which cannot be created as permeable must grade to bio-retention planters and tree pits along the side of the tracks designed with capacity to take all low flows up to the 1 in 3 month (4EY) storm event. Appropriate drainage of these elements must be shown, connecting to the trunk drainage system.
- Demonstration of how the water quality improvement targets outlined in Council's DCP 2011 will be achieved, through MUSIC (or equivalent) modelling.

C146 In support of the Water Sensitive Urban Design Strategy and Detailed Design, the Applicant must submit to DPE and Council details of deep soil and rainwater infiltration, bioretention systems, maximising permeable surface treatments, retention of trees, substantial new plantings, and rainwater harvesting.

C147 Watercourse crossings (temporary and permanent) shall be designed in consultation with NOW and Council, and where feasible and reasonable, be consistent with the Guidelines for Controlled Activities, Policy and Guidelines for Fish Friendly Waterway Crossings (NSW Fisheries 2004) and Policy and Guidelines for Design and Construction of Bridges, Roads, Causeways, Culverts and Similar Structures (NSW Fisheries, 1999). Where multiple cell culverts are proposed for creek crossings, at least one cell shall be provided for fish passages, with an invert or bed level that mimics creek flows.

C148 The Applicant is to prepare and implement a strategy for litter management and protection of waterways during operation of the Light Rail.

9.5 Drainage

The Light Rail Project will involve significant works impacting on drainage infrastructure, and it is crucial that all stormwater drainage system elements are replaced to achieve a minimum 5% AEP (1-in-20-year flood) inclusive of climate change, in accordance with Council requirements.

Recommended Conditions of Consent

C149 All topographical and drainage changes associated with the Light Rail Project must be adequately addressed and appropriately integrated within the surrounding catchment and road system in accordance with Council's standard design requirements.

C150 Existing drainage assets directly impacted by the Light Rail must be replaced in a manner compliant with the relevant policy and legislative context, including current Australian Rainfall and Runoff guidelines, Council's requirements (CBD Master Drainage Plan and other plans/requirements) and the NSW Floodplain Development Manual.

C151 All stormwater drainage system elements are to achieve a minimum 5% AEP (inclusive of the upper bound of the 0.2EY climate change impacts), in accordance with Council requirements. This includes the upstream and downstream sections of drainage network identified to ensure future proofing across the light rail and to prevent any potential increase in flooding elsewhere in the catchment.

C152 The Applicant is to provide information to Council on proposed pit inlet details, pit and pipe invert levels, pipe sizes etc. for the rail corridor and downstream off-corridor drainage network.

C153 The Applicant is to undertake hydraulic analysis and design of the stormwater drainage system for the minimum 5% peak design storm to achieve a safe overland flow path for the 1% AEP peak design flows, and confirm the adequacy of the proposed stormwater drainage network to achieve the immunity required.

9.6 Flooding Impacts at Macquarie Street

Council has particular concern in relation to flooding at Macquarie Street (Parramatta CBD), where overland flow results in floodwater depths of 0.5 - 3m depth depending on flooding event. Macquarie Street has low points and does (or soon will) receive substantial underground and aboveground stormwater discharges from Parramatta Square. The EIS has not adequately recognised these serious cumulative impacts, suggesting that flooding can be managed with minor local drainage improvements. However, substantial underground drainage infrastructure and overland flow paths are required to address cumulative impacts, and these stretch beyond the immediate vicinity of the Light Rail route.

Recommendation

R63 That, prior to determination and in consultation with Council, the Applicant is to demonstrate through more detailed modelling how the Project addresses flooding and stormwater management issues in Macquarie Street. This must include opportunities for integration with drainage and overland flow from Parramatta Square, amplification of drainage lines in Macquarie and Smith Streets or other adjacent routes, and location, design and management of safe stormwater surcharges. Redesign may be necessary.

Recommended Conditions of Consent

C154 The Applicant is to undertake in consultation with Council detailed design relating to flooding and stormwater management issues at Macquarie Street.

9.7 Water Quality during Construction

Sediment control during construction is a high risk source of water pollution and has been a chronic issue in the City of Parramatta. A recent compliance check found 50% of construction sites failed to adhere to sediment and erosion controls leading to fines. Preparation and implementation of a Water Quality Monitoring Program will help manage risks and impacts to water quality as a result of the Light Rail Project.

Recommended Conditions of Consent

C155 A Water Quality Monitoring Program shall be prepared and implemented to monitor impacts on surface and groundwater quality resources and wetlands, during the construction phase. The program shall be developed in consultation with the EPA, DPI (Fisheries), Council and the Parramatta River Catchment group and shall include:

- identification of surface and groundwater quality monitoring locations which are representative of the potential extent of impacts;
- identification of the water quality parameters to be monitored at each location;

- identification of works and activities during construction, including emergencies and spill events, that have the potential to impact on surface water quality of potentially affected waterways;
- presentation of parameters and standards against which any changes to water quality will be assessed, having regard to the principles of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* (ANZECC, 2000), the aims of Council and PRCG to return swimming to the Parramatta River, and identification of 'trigger points' for further investigation or actions;
- representative background monitoring of surface and groundwater quality parameters to establish baseline water sampling during background, and construction monitoring periods;
- a minimum monitoring period of three years following the completion of construction or until the affected waterways and/or groundwater resources are certified by an independent expert as being rehabilitated to an acceptable condition;
- contingency and ameliorative measures in the event that adverse impacts to water quality relevant to the SSI are identified;
- reporting of the monitoring results to the Department, EPA, DPI, NOW, Council and the Parramatta River Catchment Group; and
- litter management, location of Gross Pollutant Traps and other pollution control devices.

C156 The program shall be submitted to the Secretary of DPE for approval prior to the commencement of construction, or as otherwise agreed by the Secretary. A copy of the Program shall be submitted to the EPA, DPI (Fishing and Aquaculture), NOW, Council and the Parramatta River Catchment Group prior to its implementation.

C157 That regular reporting and meetings (at least quarterly) to discuss water quality results and possible changes to construction practices to improve water quality be held between the applicant and Council during the construction phase.

C158 Soil and water management measures consistent with *Managing Urban Stormwater - Soils and Construction Vols 1 and 2, 4th Edition* (Landcom 2004) shall be employed during construction to minimise soil erosion and discharge of sediment and other pollutants to land and/or water.

C159 For those construction compounds within 100m of a waterway, TfNSW will consult with Council to identify any additional actions that will be needed to reduce the risk of any pollution from the compounds reaching the waterway.

10.0 Utilities and Services Impacts

10.1 Project Approach to Utilities and Services

The EIS provides for relocation of services as a part of the Project. However, this is only in an instance where the services are *required* to be protected, upgraded or relocated as a *direct* result of the construction of the Parramatta Light Rail.

Council is seeking to have the Project include a larger and more defined scope of service protection, upgrade or relocation. Council believes that the Project provides an opportunity to consolidate the services provision for both current and future need, specifically within the CBD and the existing heavy rail corridor to Carlingford to promote efficiencies within the services provision sector. This is particularly important in light of the EIS' statement that "*Most of the asset components for the project would be likely to have a design life of between 15 and 50 years, with structural elements typically designed for a 100-year life span.*" Therefore, the future timeframe is at least the lifetime of the Project to 2060, representing a unique and timely opportunity to achieve improved long-term services outcomes to the benefit of the community, Council, service providers and the Applicant.

Council believes that key benefits of a combined services route include:

- Cost savings during installation due to shared cost of excavation
- Opportunities for cost sharing during maintenance works
- Efficient installation reducing time implications
- Efficient design so that all pipelines are accessible with the minimum amount of earthworks
- Intelligent design ensuring all pipes are protected and required safe distances obeyed
- Reduced land take within the road/rail corridors
- Shared knowledge – understanding exactly where each service is located within the combined services route and minimising unplanned impact during maintenance works.

To achieve these benefits, Council recommends establishment of a Utilities Management Group so that Council, the Applicant and relevant utilities and service organisations can have a coordinated approach.

Recommended Conditions of Consent

C160 Within three months of approval, the Applicant shall establish a Utilities Management Group (UMG) to provide input to the detailed design and construction of the SSI. The UMG shall:

- Be comprised of:
  - representatives from the Applicant, including the person responsible for detailed design;
  - representatives from the relevant Councils;
  - representatives from each utility or service organisation owning assets that will be directly or indirectly impacted by the construction or operation of the SSI; and
  - independent experts as selected by the Applicant where relevant.
- Meet at least once each month for the duration of the construction of the SSI; and
- Within three months of the establishment of the UMG, review, provide advice and agree upon the detailed design of the SSI in relation to these assets through the following:
  - review of existing services within and surrounding the Light Rail corridor including identification of areas of utility congestion;

- identification and documentation of opportunities for the development of a combined services route within the Light Rail corridor to optimise the efficient use of land surrounding the corridor and address future utility capacity requirements. This shall include identification of opportunities for incorporating utilities or services outside of the immediate impact footprint of the Light Rail corridor;
- development of the detailed design including alignment within the Light Rail corridor and cross section for the combined services route; and
- agree to the long term UMG consultation process and management agreement of the combined services route

However, if at the end of this period, the UMG members cannot agree on the detailed design for the combined services route, then any party may refer the matter to the Secretary for resolution.

Note: The Applicant may, in consultation with the Secretary, combine the function of the UMG with the function of other utility/service consultative mechanisms in the area, however, if it does this it must ensure that the above obligations are fully met in the combined process.

C161 The Applicant shall identify utilities, services and other infrastructure and property potentially affected by construction to determine requirements for access to, diversion, protection, and/or support of the affected infrastructure. Consultation with the UMG and the relevant owner and/or provider of services that are likely to be affected by the SSI shall be undertaken to make suitable arrangements for access to, diversion, protection, and/or support of the affected infrastructure as required. The Applicant shall ensure that any disruption to any service is minimised and shall be responsible for advising impact service recipients prior to any planned disruption of service. The cost of any such arrangements shall be borne by the Applicant, unless otherwise agreed with the utility/service provider.

C162 The design and construction of the SSI shall facilitate the development of a combined services route with the aim to minimise future disruptions to public space and in consultation with the UMG.

C163 All underground services works are to be done at the same time or earlier as construction of Light Rail works, while footpaths are closed to public for general use.

C164 All new/relocated services shall be placed minimum of 400mm below finished road/footpath level

C165 All new drainage pipe and culverts to be minimum 600mm below the finished designed levels.

C166 All drainage works inclusive pipes, culverts, drainage pits and grates and subsoil drains to Council and AusSpec standards (refer to Volume 2 of the Urban Design Framework for more information).

C167 All drainage design shall be approved by delegated Council officer. All construction of new/augmented drainage shall be inspected and approved by relevant council officer.

C168 Locations and details of all utilities works shall be recorded (including type and size, number of conduits and other relevant data as per Australian standards), and Work As Executed (WAE) plans are to be sent to relevant authorities and Council for information and future use.

10.2 Intrusions into Drainage System

Council does not allow any services within its internal drainage system, either longitudinally or horizontally. In case of the construction of a new drainage pipe on top of the existing service,

adequate bridging construction is required to both Council and service authority detail and approval. All utility works are to meet relevant Australian Standards, guides and individual service authority requirements. Construction is to follow AusSpec Utility Guide.

Recommended Conditions of Consent

C169 In case of the construction of a new drainage pipe on top of the existing service, adequate bridging construction is required to both Council and service authority detail and approval. All utility works to relevant Australian Standards, guides and individual service authority requirements. Construction is to follow AusSpec Utility Guide.

11.0 Biodiversity Impacts

Section 12 of the SEARs states that *"the Proponent must assess any impacts on biodiversity values not covered by the Framework for Biodiversity Assessment (as specified under s2.3 of the FBA)."* The full array of threatened species listed under the *NSW Threatened Species Conservation Act* (TSC Act) have not been adequately addressed within the EIS (Chapter 10) as only those threatened species listed under the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) have been addressed.

As the majority of the route (and associated infrastructure) is located within the existing street network or the existing heavy rail line corridor, there are only a small number of fragmented patches of native vegetation likely to be impacted. Council concern relates to the Project's interface with Vineyard Creek Reserve (to the north of Kissing Point Road), riparian vegetation along Parramatta River and Vineyard Creek and trees along the Carlingford railway corridor.

In addition, the occurrence of native vegetation communities within the existing Carlingford railway corridor also indicates that hollow bearing trees are likely present, and these provide important habitat for birds and small mammals, including microchiropteran bats.

Furthermore, bridge crossings over the Parramatta River (near Western Sydney University and Cumberland Hospital) and Vineyard Creek also provide important potential artificial roosting opportunities for microchiropteran bats such as the Southern Myotis (Myotis macropus) and Eastern Bent-wing Bat (Miniopterus schreibersii oceanensis). Impacted riparian vegetation is otherwise generally disturbed and dominated with exotic weed species, with aquatic habitats only likely to provide habitat for invertebrates, amphibians and waterbird species that are well adapted to disturbed environments.

NSW Office of Environment and Heritage (OEH) priority actions for the Southern Myotis (Myotis macropus) include 'Promote roosting habitat in new artificial structures' and to 'protect and enhance roost habitat beneath artificial structures e.g. bridges' (OEH Saving our Species 2015): The construction of new bridges over the Parramatta River at the Cumberland Hospital site and Vineyard Creek near Western Sydney University provide important opportunities to provide roosting habitat for microchiropteran bats such as the Southern Myotis (Myotis macropus), Eastern Bent-wing Bat (Miniopterus schreibersii oceanensis) and Eastern Freetail Bat (Mormopterus norfolkensis) which often use bridges over watercourses.

Whilst roost boxes have been suggested to be installed under the new bridges, this is a temporary measure as the wooden boxes deteriorate and require ongoing maintenance. A preferred approach is that the new bridges incorporate more permanent microbat habitat through the provision of suitably dimensioned cavities and lattice structures (as has been achieved in recent RMS bridge replacements, for example, Sportsmans Creek near Maclean). Council can supply the specifications for the bridge over Sportsman Creek to the DPE if required.

The project requires the establishment of a number of construction compounds along the light rail alignment for stockpiling and storage of materials, including within Vineyard Creek Reserve at Kissing Point Road. This compound adjoins Sydney Turpentine-Ironbark Forest EEC and is on flood prone land (within 20 year ARI). It therefore has significant potential for stockpiled materials to impact the adjoining EEC during a flood event. A popular walking track is also located along the eastern boundary of the proposed compound.

Recommendation

R64 In accordance with SEARs Section 12, all Threatened Species listed in the *NSW Threatened Species Conservation Act 1995* identified in *Table D.1 – Fauna species likelihood table* as being either of Moderate or High Likelihood of Occurrence need to be

adequately addressed by the Applicant within the EIS or with an Assessment of Significance. The species that this relates to are:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Spotted Black Cockatoo (*Calyptorhynchus lathami*)
- Varied Sittella (*Daphoenositta chrysoptera*)
- White-fronted Chat (*Epithianura albifrons*)
- Little lorikeet (*Glossopsitta pusilla*)
- Little Eagle (*Hieraatus morphnoides*)
- Powerful Owl (*Ninox strenua*)
- Scarlet Robin (*Petroica boodang*)
- Yellow-bellied Sheathtail bat (*Saccolaimus flaviventris*)
- Greater Broad-nosed bat (*Scoteanax rueppellii*)
- Dural Land Snail (*Pommerhelix duralensis*)

Recommended Conditions of Consent

C170 That no loose materials are to be stockpiled within the Vineyard Creek Reserve compound to minimise potential impacts on the nearby Sydney Turpentine-Ironbark Forest EEC. Compound location must also ensure that pedestrian access is maintained along the pathway located on the eastern boundary.

C171 That the design of the new bridges over Parramatta River and Vineyard Creek incorporate suitably dimensioned cavities and lattice structures underneath to provide important low maintenance roosting habitat for threatened microchiropteran bats.

C172 A Flora and Fauna Management Plan must be prepared and implemented by the Applicant as part of the Construction Environmental Management Plan to detail how impacts on ecology will be minimised and managed. It must be prepared by a suitably qualified and experienced ecologist in consultation with Council, and must include, but not be limited to:

- Procedures for the clearing of vegetation and the relocation of flora and fauna;
- Procedures for the demarcation and protection of retained vegetation, including all vegetation outside and adjacent to the construction footprint;
- Plans for impacted and adjoining areas showing vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities have been recorded;
- Identification of measures to reduce disturbance to sensitive fauna;
- Rehabilitation details, including identification of flora species and sources, and measures for the management and maintenance of rehabilitated areas (including duration of the implementation of such measures);
- Weed management measures focusing on early identification of invasive weeds and effective management controls;
- Procedure for dealing with unexpected identification of Endangered Ecological Community (EEC) or threatened species during construction;
- Auditing and monitoring requirements.

12.0 Tree Impacts

The proposed Light Rail corridor will have an impact on a significant number of trees, estimated over 2,000, located in streets, reserves and the existing heavy rail corridor. However, the EIS does not clearly delineate or assess the significance levels of the impacted trees or hollow-bearing trees. The design and location of the Project needs to minimise removal of highly significant trees. The EIS should undertake a tree assessment with an accompanying significance map that identifies the location of *high*, *medium* and *low* value trees.

The EIS fails to adequately address the potential removal of hollow-bearing trees that may be present within the Light Rail corridor. The 'Loss of Hollow Bearing Trees' is a Key Threatening Process under the *Biodiversity Conservation Act 2016* and needs to be minimised as per the SEARs. Design and location of infrastructure needs to minimise the number of tree removals (particularly hollow-bearing and other highly significant trees), and is to ensure no significant impacts on nearby retained trees.

The EIS proposes management of loss of trees and vegetation through the development of a Vegetation Offset Strategy. To ensure canopy replenishment, any removed trees are to be replaced in accordance with Transport for NSW's *Vegetation Offset Guide* (2016), being a ratio of between 2:1 and 8:1 depending on the size of the tree removed.

Council's recently adopted Environmental Sustainability Strategy (2017) recognises that tree canopy contributes significantly to the liveability of our city, a key action of the Strategy is to "increase canopy cover to 40% by 2050 (based on 2016 levels)." Another key action of Council's Strategy is to "prioritise planting along cycleways and the Parramatta Ways walking network."

Council's Parramatta Ways Walking Strategy (2017) aimed at improving walkability throughout the LGA and recognises the importance of walkability for liveability and we are seeking to create a safe, comfortable, attractive and interesting City for people to get active and connected. As a result, this strategy is not just about transport but also a formalised plan for increasing urban greening, recreation and local centre amenity.

Maintaining a healthy urban forest that provides adequate levels of shade over road surfaces will help reduce air and surface temperature extremes, particularly in summer. The Project will attract a large number of pedestrians, and providing shade around stops and in the streets leading to them will be critical in ensuring a high level of pedestrian comfort. This will encourage ongoing patronage and will help ensure the long term success of the Light Rail system.

In consideration of the likely large number of offset plantings required, this will not be achievable solely within the Light Rail corridor. It will require a diverse approach that also incorporates street tree planting and revegetation within other streets and Council reserves. This should be undertaken within or in proximity to the project footprint and needs to be implemented as per a specific vegetation offset strategy in consultation with Council.

Recommendation

R65 That the Applicant provides further detail to Council about tree impacts, including:

- A consolidated total number of trees to be impacted, including clarifying the numbers and extent of "minor", "more than minor" and "full removal" impacts;
- Assessment of significance of all impacted trees (i.e. high, medium or low); and
- Demonstrate how significant trees have been considered for retention

Recommended Conditions of Consent

C173 Prior to construction, the Applicant prepares a revised tree survey, which is undertaken by a qualified ecologist, to identify the type and location of hollow bearing trees that will potentially be impacted by the Project and recommended mitigation strategies, for

example nesting boxes. The survey and recommended mitigation strategies shall be submitted to Council for review.

C174 All retained street and park trees within or in proximity to works are to be physically protected by implementing tree protection measures in accordance with AS4970:2009 (Protection of Trees on Development Sites).

C175 Site specific tree protection plans shall be prepared and submitted to Council for approval in accordance with AS 4970:2009 (Protection of Trees on Development Sites) for the following public parks and places:

- St Patricks Cemetery
- Prince Alfred Square
- Robin Thomas Reserve
- Queens Wharf Reserve

C176 The Applicant shall prepare and implement a Vegetation Offset Strategy to outline how the vegetation impacts of the project will be compensated for within and adjacent to the corridor. The Strategy shall be prepared prior to construction and the removal of any tree and vegetation, and shall be prepared in consultation with Council and be developed in accordance with Transport for NSW Vegetation Offset Guide (2013) and Council's Parramatta Ways (2017). The scope of the Vegetation Offset Strategy shall include:

- The identification of the exact extent and types of tree and vegetation impacts as a result of the final design of the project;
- Detail the mitigation measures, including locations and vegetation, which will offset the removal.
- The consideration of the following vegetation programs as part of the strategy:
  - Existing high value trees being retained and protected for the duration of the project.
  - Replacement tree planting. Small trees (<20sqm canopy area), unhealthy trees or trees that do not contribute to the desired future character of streets, plaza's and public squares are replaced with appropriate trees that will help to achieve the 40% canopy cover by 2050 (refer Council's Environmental Sustainability Strategy 2017).
  - Relocation of high value trees
  - Tree planting in streets, plaza's and public squares
  - Tree planting in parks
  - Revegetation in bushland reserves to improve biodiversity and restore habitat.
  - Reservation of land in close proximity of the Light Rail corridor for biodiversity offset or conservation
- A communication strategy aimed at planning tree and vegetation planting in consultation with the local community.
- Measurement for the management, protection and monitoring of the vegetation for a minimum of two years.
- Timing and responsibilities for the implementation for the provisions of the Strategy.

13.0 Environmental Management

13.1 Construction Management

It is noted in the EIS that a Construction Environmental Management Plan (CEMP) will be developed by the appropriate contractor and submitted to the Secretary of DPE for approval. This CEMP should also be submitted to Council for review prior to consent being granted and construction commencing.

It is noted that Independent Environmental Representatives will be engaged by Transport for NSW to provide review and oversight of relevant environmental documentation, environmental monitoring/auditing/reporting services, and guidance on emergency actions throughout the duration of the Project. This proposal is fully supported by Council and provides a degree of assurance that is welcomed.

Recommended Conditions of Consent

C177 A Construction Environmental Management Plan (CEMP) is to be prepared during the detailed design phase for implementation through all construction activities and submitted to the DPE for approval. Council is to be consulted in the preparation of the CEMP.

13.2 Noise and Vibration

Construction Noise and Vibration Impacts
The Project should apply all feasible and reasonable work practices to reduce potential noise and vibration impacts. The Project's Construction Noise and Vibration Management Plan (CNVMP) would be prepared during detailed design and would provide the framework and mechanisms for the management and mitigation of the noise and vibration impacts.

It is noted in the recommendations that a curfew time of 11:00pm is proposed for the use of noise intensive plant items. An alternate curfew time of 10:00pm is proposed by Council (refer Draft Conditions of Consent) as this is consistent with the *Protection of the Environment Operations (Noise) Regulation* definition of night-time and is consistent with time of use restrictions for other noise generating activities prescribed in the Regulation, and the DECC[W] reviewed research on sleep disturbance in the NSW Environmental Criteria for Road Traffic Noise (ECRTN) (EPA, 1999) referenced in section 3.2.2.2.

The detailed analysis should cover the maximum noise level or LA1, (1 minute), that is, the extent to which the maximum noise level exceeds the background level and the number of times this happens during the night-time period. Some guidance on possible impact is contained in the review of research results in the appendices to the ECRTN. Other factors that may be important in assessing the extent of impacts on sleep include:

- How often high noise events will occur
- Time of day (normally between 10pm and 7am)
- Whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods)
- The LA1, (1 minute) descriptor is meant to represent a maximum noise level measured under "fast" time response. DECC[W] will accept analysis based on either LA1, (1 minute) or LAmax".

It is noted that a large number of sensitive receivers will be adversely impacted by exceedances of the Noise Management Levels (NMLs) during construction of the Light Rail along the entire works corridor. It is the view of Council that it is essential that all reasonable and feasible mitigation measures are made available to all of these receivers/locations.

Recommended Conditions of Consent

C178 Prior to the commencement of construction, the Applicant shall prepare a Construction Noise and Vibration Management Plan. Council shall be provided a draft of the Plan for review and comment. This shall include procedures for dealing with potential impacts during out of hours work and minimising sleep disturbance as per the guidance provided in NSW Environmental Criteria for Road Traffic Noise (ECRTN) (EPA, 1999).

C179 The CNVMP should apply all feasible and reasonable work practices to meet the Noise Management Level (NML), where possible, and inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels, duration of noise generating construction works, and contact details during construction. Where NML's are shown to continue to be exceeded, individual management strategies will need to be developed with these residences/locations to ensure an acceptable outcome for the community.

C180 The use of noise intensive plant items should be scheduled for construction hours (7am to 6pm). If the works cannot be undertaken during these hours, they are to be completed before 10:00pm.

C181 Where vibration intensive works are required within the safe working distances, vibration monitoring or attended vibration trials shall be undertaken to ensure that levels remain below the cosmetic damage criterion.

C182 Building condition surveys should be completed, where necessary, both before and after the works to identify existing damage and any damage due to the works.

C183 Lower vibration generating items of excavation plant and equipment, such as smaller capacity rock-breakers or concrete crushers/pulverisers in place of rock-breakers, should be used where possible.

Operational Noise Impacts

An Operational Environmental Management Plan should be developed for the management of noise and vibration impacts during operation. This would be implemented prior to operations and would then be validated once the Project is complete (usually 12 months' post opening).

It is noted that at several locations along the Project corridor there will be sensitive receivers that are impacted by noise level exceedances in excess of 25dBA above the noise management levels (NML). Further identification of these receiver locations and strategies to mitigate such impacts will be required to be addressed as part of the Construction Noise and Vibration Management Plan and Operational Environmental Management Plan to ensure that any such noise impacts are appropriately managed. This will need to be done on an individual basis and with close consultation with the affected parties.

In total, 42 residential and 48 other sensitive receivers are predicted to be above the noise trigger levels in the 2033 design year. Specifically, Council considers sensitive precincts are the Westmead medical and residential precincts and the Parramatta North Urban Transformation Precinct as these are likely to include a higher density of sensitive receivers within quieter areas that could be impacted to a greater extent than the Parramatta CBD, industrial and existing rail line areas. Council recommends that consideration should be made to the provision of noise mitigation treatment measures to buildings identified as likely to experience noise level exceedances resulting from the Light Rail operation. The potential for property treatments to be undertaken early in the project timeline should also be considered for residential locations which are above the trigger levels and also likely to be exposed to high levels of construction noise over long periods from the project.

Ground-borne noise impacts

More detailed investigations would need to be conducted into the potential for ground-borne noise impacts including measurement of existing internal and external noise and vibration levels due to the existing road and rail traffic. These investigations would inform the required resilient trackform design in these locations and confirm the appropriateness of the ground-borne noise design goals. This will be subject to the specific design criteria selected by the preferred project delivery contractor and Council should be provided opportunity to review.

Substation noise impacts
Several locations are reported to experience exceedances of the Project noise goals due to noise from substations. However, these exceedances are predicted in the absence of specific noise mitigation measures. It is noted in the report that the substations at all locations can be designed to meet the noise goals by provision of shielding or an enclosure of the noise source, if necessary. Acoustic louvres should also be included in the design where ventilation is required and potentially affected receivers are nearby. With these noise mitigation measures included compliance with the applicable noise criteria can be achieved. Specific noise mitigation measures would be confirmed during the detailed design of the Project when further details about the equipment and site layout are available. Validation monitoring and reporting will need to be conducted prior to commencement of operation to ensure that noise impacts from substations have been appropriately mitigated.

Stabling and Maintenance Facility Noise
The Camellia Stabling and Maintenance Facility would provide for the stabling and maintenance of LRVs to meet the operational requirements of the Project. These facilities are considered to be industrial and as such noise levels are required to be assessed in accordance with the Industrial Noise Policy.

The assessment found that the noise criteria for adjacent commercial and distance residential receivers are not predicted to be exceeded for any of the modelled scenarios during the daytime, evening and night-time periods. However due to the Department of Planning and Environment' work at Camellia as a Priority Precinct (refer Section 2 of this Submission), further noise assessment will need to be carried out prior to the final design of the Facility reflecting potential future surrounding land-uses which are more sensitive, including residential and businesses.

Operational Vibration Impacts
Council is satisfied with the process that the applicant is undertaking to assess operational vibration impacts, including predicted vibration levels and consultation with facility owner/operators of premises with identified vibration sensitive equipment. These investigations would inform the required track form design in these locations.

Recommended Conditions of Consent

C184 Prior to operation, the Applicant shall prepare and implement an Operational Environmental Management Plan (OEMP), which shall address noise and vibration issues associated with the operation of the light rail. Council shall be provided a draft of the Plan for review and comment.

C185 Following 12 months of operation of the Parramatta Light Rail, the Operator shall prepare a noise and vibration validation report in accordance with the requirements of the Operation Environmental Management Plan. Council shall be provided a copy of the draft Report for review and comment.

C186 For airborne noise created by rail operations on surface track, noise trigger levels (as defined in the OEMP) are applicable. If these are exceeded, either at opening or at an indicative time in the future (taken to be ten years after opening), consideration of noise mitigation is required to be considered.

C187 Prior to the commencement of operation, the Applicant shall undertake more detailed investigation into the potential for ground-borne noise impacts, including measurement of existing internal and external noise and vibration levels due to the existing road and rail traffic. These investigations would inform the required resilient track form design in these locations and confirm the appropriateness of the ground-borne noise design goals. A copy of this investigation shall be provided to Council for review.

C188 Prior to commencement of construction the Applicant shall provide 'at receiver' structural noise mitigation treatment measures to buildings identified as likely to experience noise level exceedances resulting from the Project's operation.

C189 Validation monitoring and reporting prior to commencement of operation shall include noise impacts from substations to ensure that noise impacts have been appropriately mitigated.

C190 Prior to final design of the Stabling and Maintenance Facility, the Applicant shall undertake noise and vibration assessment based on future surrounding land uses in consultation with the Department of Planning and Environment as part of the Camellia Priority Precinct process.

C191 Prior to the commencement of construction, the Applicant shall provide any noise mitigation treatments to those residential and other sensitive land uses identified along the corridor as likely to experience noise level exceedances resulting from the PRL operation. This condition shall not preclude the Applicant from other reasonable mitigation measures for those properties that are exposed to high levels of construction noise over long periods from the Project.

13.3 Contamination

The Contaminated Land Technical Paper (CLTP) (Technical Paper 8) is effectively a Preliminary Site Investigation as per the requirements stipulated under SEPP55 for management of contaminated land under the land-use approval process. This means that it is a desktop study that does not include actual sampling or analysis. It is strongly suspected that - given the proposed corridor, existing knowledge and historical usage of this land - it is highly likely that land contamination of an extent that will require remediation will be encountered. All soils in the existing railway corridor are deemed to be contaminated until proven otherwise by testing, remediation and validation. The areas of environmental interest should not exclude residential areas unless it can be demonstrated by testing that residential zones are clean.

The type and extent of contamination that will be found along the existing Carlingford rail corridor will comprise residual contamination that may be found along any stretch of rail corridor including rail infrastructure, water in drainage channels along the corridor and contamination associated with industrial uses alongside it.

Before and after acquisition, the Applicant must ensure they have considered the following potential contaminants in the soil and groundwater from on site and off site migration within the project area and buffer areas:

- Metals (arsenic (As), cadmium (Cd), copper (Cu), chromium (Cr), mercury (Hg), lead (Pb),nickel (Ni), zinc (Zn)) and metalloids associated with imported fill and various industrial waste streams (e.g.foundries and other metal works, timber works, paint works, printing works, etc).
- Polycyclic aromatic hydrocarbons (PAHs) associated with imported fill (especially gasworks wastes), use and storage of fuels and oils, by-products from boiler houses and various industrial waste streams.
- Petroleum hydrocarbons (total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (MAHs)) and phenols associated with the use and storage of fuels and oils and various industrial waste streams.

- Solvents (non-chlorinated solvents (e.g. kerosene, petroleum ether, white spirit, turpentine, phenol, acetone) and chlorinated solvents (e.g. Pentachloroethane (PCE), trichloroethene (TCE), and breakdown products) associated with the use and storage of lubricating and hydraulic oils, printing, degreasers, various industrial waste streams and dry cleaners.
- Creosote, associated with gasworks and treatment of rail timbers.
- Asbestos associated with the construction and demolition of existing and former buildings, and the wearing of mechanical parts, including brakes (of cars and trains).
- Methane and hydrogen sulphide associated with degradation of organic waste or natural organic rich soils/sediments in fill.
- Polychlorinated biphenyls (PCBs) associated with electrical sub-stations (transformers and capacitors and manufacture of electrical equipment.

Other potential contaminants that may be present but less likely to be widespread:

- Acids and caustics associated with imported fill and various industrial waste streams.
- High salinities (TDS) and nutrients (ammonia, nitrate, sulfates) associated with imported fill
- Pesticides / herbicides associated with spraying of weeds and pests.
- Chemicals associated with plastics, adhesives and resins (e.g. polyvinyl acetate, formaldehyde, acrylates, phthalates etc.
- Cyanide associated with imported fill, metal treatment and other industrial streams.
- Perfluorinated compounds (PFCs) and associated chemicals used as fire retardants or suppressants.

Many sources of potential impact to groundwater and soil vapour are present within the buffer zone of the Project area along the Light Rail route, including a former gasworks facility, former service stations, dry cleaners, and impacts associated with historical industrial activities. Unfortunately, there is not extensive information published on groundwater and soil impacts across the Light Rail route.

The Parramatta Light Rail will involve construction of infrastructure, above and possibly below the existing groundwater table and may involve excavation of fill, soil and rock (spoil); offsite disposal of excavated spoil; and management of groundwater level and excavation in flow disposal. Therefore, an understanding of the potential for contamination of soil, soil vapour and groundwater which may be intercepted by the Light Rail concept design is integral to plan appropriate environmental management. The extent and nature of groundwater and soil vapours need to be investigated in detail to understand extent and manage the potential impact on the Parramatta Light Rail design schedule or cost.

The key guidance documents to support a review of potential contamination activities and land uses with the potential to cause site contamination along the Parramatta Light Rail route are the following:

- *National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999, as amended 2013, document ID F2013C00288 (NEPM, 2013):* The NEPM provides information on the design and implementation of soil, groundwater and vapour sampling programs and the presentation of site assessment reports. Guidance is also provided on the measures that should be adopted to ensure protection of the environment during site assessment, including recommendations of what should be included within a preliminary site investigation (PSI) site history review. It defines radius of extent that site histories should consider to understand the potential sources of impacts
- *Australian Standard, 2005, Guide to Investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi volatile compounds (AS, 2005):* The Australian Standard provides guidance for collecting sufficient and reliable information for the assessment of a site potentially contaminated by non-volatiles and semi-volatile compounds. Includes guidance on the scope and useful sources that should be reviewed

when undertaking a preliminary site investigation. Appendix J of the standard also provides a list of industries and associated chemicals that should be considered

Technical Paper 8*'s Chapter 6 (Principles for further assessment and remediation)* notes the proposed procedure that will dictate how further assessment and remediation is to be conducted. While it makes reference to the *DECCW Guidelines for the NSW Site Auditor Scheme* (DECCW 2006), it does not specifically state where, how and when EPA accredited Site Auditors will be engaged to oversee and endorse the relevant stages of contamination assessment and remediation. Further clarity on the triggers for and extent of Site Auditor involvement is required.

An Unexpected Finds Protocol is not mentioned in Section 17.2 (consolidated mitigation and management measures). It is recommended that an Unexpected Finds Protocol be implemented and incorporated into the CEMP for the entire project.

Council notes that the subsurface of the stabling and maintenance facility at Camellia would be remediated under a planning approval process separate from the Environmental Impact Statement. It is expected that Council will be provided opportunity to review and comment on this or any other individual planning approval process related to the Light Rail Project.

Finally, the Applicant must prepare a communication strategy and undertake a communication and engagement program to ensure that all site contamination risks are communicated effectively and consistently to all stakeholders especially local residents and business owners.

Recommendation

R66 That prior to determination of the EIS, the Applicant shall clarify the triggers for and extent of involvement of the Site Auditor.

Recommended Conditions of Consent

C192 That prior to construction of the Project, a preliminary soil investigation must be conducted of the route to evaluate the suitability of the land for its intended use. The preliminary soil investigation shall be conducted by a suitably qualified person(s) in accordance with the NSW Environment Protection Authority's *Guidelines for Consultants Reporting on Contaminated Sites.* The preliminary investigation is essentially a desktop exercise with the objectives of:

- Identifying potential contamination sources, nature of contamination and the affected areas;
- Highlight areas of potential contamination which may be intercepted by the Parramatta Light Rail corridor design;
- Inform the Parramatta Light Rail risk register(s) and the various phases of intrusive investigation (Concept Design and Procurement Phase).
- Prior to the construction of the Parramatta Light Rail including decommissioning of the existing Clyde to Carlingford heavy rail corridor a detailed contaminated site investigation must be conducted by a qualified and experienced land contamination consultant and a draft and final report of the investigation must be supplied to the appropriate regulatory authority.
- Draft remediation action plans and validation plans must be submitted to the appropriate regulatory authority and Site Auditor for approval prior to commencement of remedial works;
- All remedial works must be carried out in accordance with clauses 17 and 18 of State Environmental Planning Policy 55 - Remediation of Land;
- Where the remedial action has been carried out, a validation report must be submitted to the appropriate regulatory authority stating that the objectives in the RAP have been achieved and the land is remediated to standard suitable for the proposed land use; and

- The Applicant shall engage a NSW EPA accredited auditor to undertake an independent review of the site investigation, remediation action plan and validation reports to address the requirements of section 47(1) (b) of *the Contaminated Land Management Act 1997*. A site audit statement is to be submitted to the appropriate regulatory authority prior to commencement of construction works verifying that the primary consultants work complies with all appropriate laws, standards, procedures and relevant NSW Guidelines.

C193 That during remedial works the Applicant must engage an Independent Licensed Asbestos Assessor to ensure asbestos removal does not pose a risk to health and safety during remediation of the route.

C194 That all fill imported onto the project area is to be virgin excavated natural material or excavated natural material (VENM or ENM) and shall be certified as such by a suitably qualified industry professional. Fill imported on to the site shall also be compatible with the existing soil characteristic for site drainage purposes.

C195 That all waste soil material disposed of offsite must be classified according to the NSW EPA Waste Classification Guidelines and waste classification certificates must be submitted to the appropriate regulatory authority. Note that the NSW environment protection legislation require transporters to use the EPAs WasteLocate to record details of all consignments of asbestos waste within NSW, where the load is greater than 100 kilograms or 10 square metres.

C196 That, once inherent risk levels are finalised for all AEIs, all of the mitigation and management measures for the project should be documented in a Construction Contaminated Land Management Plan (CCLMP) which forms part of the overall Project's Construction Environment Management Plan (CEMP). This CCLMP should be provided to Council for review and comment prior to construction commencing.

C197 That an Unexpected Finds Protocol be implemented and incorporated into the CEMP for the entire Project.

C198 That the applicant prepares a contamination communication strategy and undertakes a communication and engagement program to ensure that all site contamination risks are communicated effectively and consistently to all stakeholders, especially local residents and business owners.

13.4 Air Quality

Air quality is noted in the EIS documents as medium risk and not a *key issue*. However, Council considers that the potential for air quality impacts from dust generation potentially containing asbestos fibres (due to the likelihood of contaminated soils being disturbed during construction) should be reflected as high risk and a *key issue*.

The Air Quality Technical Paper notes that there was no specific guidance relating to air quality in the project-specific SEARS. In order to address potential air quality impacts of the proposal, the assessment contained in that Technical Paper was completed against the *Critical State Significant Infrastructure Standard Secretary's Environmental Assessment Requirements* relating to air quality. Council considers that potential air quality impacts (particularly during construction) should have been considered important enough to warrant a SEAR.

The Technical Paper identifies several construction activities which have a medium residual risk of generating air quality impacts during the Project. These activities are expected to include excavation, remediation, materials storage and management, ballast screening, crushing and recycling activities within the Sandown Line, compound operations and works at the Camellia maintenance depot and stabling facility. While the potential impacts were considered at a project scale, it was also identified that areas of the project near to more densely populated areas and

locations with highly sensitive land uses would require the highest level of attention during the works.

The Technical Paper recommends a variety of different mitigation and management measures for incorporation into the CEMP and OEMP documents for the relevant Project phases. These included appropriate work practices and scheduling, consultation/co-ordination of works, equipment selection, monitoring and preventative controls. Council supports the recommendation of the Technical Paper that the measures advised in the assessment are reviewed and updated as necessary once detailed design information is available and as the Project progresses. Any further assessment conducted along these lines should be provided to Council for review and comment.

Recommended Conditions of Consent

C199 That all measures advised in Technical Paper 9 to address air quality impacts are incorporated into the Project.

C200 That the measures advised in Technical Paper 9 are reviewed and updated as detailed design information becomes available, and that any further assessment regarding air quality impacts is to be provided to Council for review and comment.

13.5 Independent Monitoring and Reporting

Monitoring and reporting are vital parts of any environmental management system, and how this is to be achieved under the Light Rail Project is unclear. Given there a number of environmental plans and outcomes being recommended as part of this submission, and the likely changes that will occur between design and construction, it is essential that an independent representative be appointed to ensure these plans are developed, delivered and monitored throughout the project.

Recommended Conditions of Consent

C201 Prior to the commencement of construction of the SSI, or as otherwise agreed by the Director General, the Proponent shall nominate for the approval of the Director General a suitably qualified and experienced Environmental Representative(s) that is independent of the design and construction personnel. The Proponent shall employ the Environmental Representative(s) for the duration of construction, or as otherwise agreed by the Director General. The Environmental representative(s) shall:

- be the principle point of advice in relation to the environmental performance of the SSI;
- monitor the implementation of all environmental management plans including but not limited to the Greenhouse Gas Emissions, Water Use, Climate Change Adaptation, Biodiversity, Flood Risk Management and monitoring programs required under this approval and advise the Proponent and Council upon the achievement of these plans and programs;
- have responsibility for considering and advising the Proponent on matters specified in the conditions of this approval, and other licenses and approvals related to the environmental performance and impacts of the SSI;
- ensure that environmental auditing is undertaken in accordance with the Proponents Environmental Management System(s);
- be given authority and independence to advise on reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts; and
- be consulted in responding to the community concerning the environmental performance of the SSI where the resolution of points of conflict between the Proponent and the community is required.

Appendix A Summary of Recommendations and Recommended Conditions of Consent

Summary by Section

2. Precincts

Recommendations

R1 That the Applicant relocate the Westmead terminus to ensure:
- An integrated multimodal interchange at Westmead Railway Station;
- Achieve seamless connections between modes (light rail, heavy rail, bus t-way and future metro) which address principles of Universal Access, DDA and BCA compliant;
- Realign with Hawkesbury Road to achieve a central spine through Westmead's central street; and
- Demonstrate a future proof light rail connection south of the railway line.

R2 That the Applicant undertake a whole of street design and streetscape upgrade for Hawkesbury Road that redefines Westmead's main street and prioritises pedestrian movement and amenity which is central to the realisation of Westmead as an Innovation Precinct.

R3 That the Applicant undertake further design work on the three stop locations within Westmead to achieve a strong and consistent streetscape which prioritises pedestrian movement and has a high degree of pedestrian amenity

R4 That the Applicant work with property owners on the eastern side of Hawkesbury Road to achieve a holistic approach to an improved public domain, street trees and planting.

R5 The Applicant, in collaboration with Council and DPE, is to undertake detailed investigation of the alternate alignment from Westmead to Parramatta North (as detailed in Appendix B) to understand benefits and impacts relative to the proposed alignment presented in the EIS.

R6 That the Applicant refine the design of Church Street North to achieve:
- A consistent street profile and character which builds from key elements within the existing streetscape
- A continuous light rail alignment with vegetated tracks which strengthens legibility of the streetscape
- Reduced property impacts to key sites including St. Patrick's Cemetery, the Royal Oak Hotel and Prince Alfred Square
- Reduced tree impacts, planting new trees wherever possible and training existing mature eucalyptus
- Stop placements which consider future northern extensions and draw on existing place-based qualities and historical references
- A clear delineation between light rail, local traffic and bus corridors
- Provision of efficient and effortless bus interchanges at Parramatta North
- Pedestrian permeability at least equal to the existing streetscape with direct crossings protected by refuge islands (without staggers or deviation) at each street intersection and pedestrian medians where required.

- A public domain response which responds to historic places and has deference to heritage surrounds
- Design public domain and surrounds of Prince Alfred Square to visually extend, clarify and define the historic square

R7 That the Applicant refine the design of the stop and alignment beside Prince Alfred Square to achieve:

- Seamless integration with the existing geometry and features of the square, addressing the functions of this significant civic place
- A high-quality public domain upgrade which enhances and extends the character of the square
- A light rail alignment which is subservient to existing place-based qualities
- Traffic movement which responds to local access requirements and is compatible with the potential closure of Market Street in order to facilitate the redevelopment of Riverside Theatres upgrade
- A high degree of pedestrian amenity which responds to daily use and events, particularly related to Western Sydney Stadium, the Riverside Theatres and the ANZAC Monument
- A visually decluttered environment which minimises new infrastructure, is wire-free, barrier-free, and generally subservient to the prevailing heritage context
- Unimpeded pedestrian flows free from urban barriers or blockages

R8 That the Applicant refine the alignment design at Lennox Bridge to achieve:

- A visually decluttered environment which minimises new infrastructure, is wire-free, barrier-free seamlessly integrates new and existing materials and finishes and is generally subservient to the prevailing heritage context
- Test options for splitting the Lennox Bridge stop in place of both the Prince Alfred Square stop and stop just north of George Street
- Flush finishes with high-quality natural materials that echo Lennox Bridge and Church Street's heritage identity
- Accessibility to the River Foreshore and connections to the future Museum of Applied Arts and Sciences and Parramatta Ferry Wharf

R9 That the Applicant refine the design at Church Street (CBD) to achieve:

- A consistent and continuous high-quality street profile which provides an integrated solution considering both urban functions (i.e. outdoor dining), safety, principles of Universal Access, DDA and BCA requirements
- Test options for splitting the Church Street stop platforms either side of George Street to reduce impacts and improve street activation
- Weather protection for pedestrians
- Trees to improve microclimate
- A visually decluttered environment which minimises new infrastructure, is wire-free, barrier-free and is generally subservient to the prevailing heritage context
- Flush finishes which integrate seamlessly across the streetscape
- Carefully considered drainage and regarding work which does not adversely impact on existing floor levels and finishes
- An overall design which is mindful of significant pedestrian flows and does not impede these with urban barriers or blockages
- A stop shelter design fully integrated into existing awnings
- Stop kit/infrastructure fully integrated into existing built form to declutter footpaths

- Due consideration for the existing overall architectural character of the streetscape, including awnings

R10 The Applicant must demonstrate that the impacts to the Parramatta CBD created by the alignment on Macquarie Street will be acceptable, including:

- Providing modelling which demonstrates that the Parramatta CBD north of the heavy rail line can function effectively with one east-west street in daily, event and emergency modes
- Resolving the location of the Parramatta CBD Metro station, anticipated patronage and interchange demand to inform alignment and stop options in order to demonstrate a satisfactory interface with the Light Rail alignment and stop location on Macquarie Street and existing heavy rail station;
- Design a consistent and legible streetscape for Macquarie Street which ensures universal access, enhances east-west pedestrian connections and permeability with high-quality materials, provides strong identity and supports the Parramatta CBD growth with a high-quality urban space
- Moving the Parramatta Square stop west of the Civic Link to ensure clear and unencumbered pedestrian access along the Civic Link and the provision of a clear sight line to the Railway Station
- Providing for unencumbered vehicle access to Parramatta Square during the construction and operation of Light Rail
- Investigating a shared zone along Macquarie Street between Church Street and Horwood Place to improve legibility and consistency of streetscape
- Conducting further design work to resolve the major pedestrian desire line to Centenary Square
- Maintaining the George Street series of pocket plazas and forecourts with planting and large buildings set back from the street; these are to linked through a detailed public domain design that addresses levels materials and planting species
- Minimising impacts of the functions of the public domain including outdoor dining and event systems during construction and operation of Light Rail
- Demonstrating that any resulting impacts to George Street and the Parramatta CBD cycle network are acceptable to Council

R11 The Applicant modify the light rail alignment to run straight from George Street via Noller/Tramway.

R12 That the Light Rail alignment be modified to run along Grand Avenue.

R13 That the Applicant prepare a Cost Benefit Analysis (CBA) in order to better assess the advantages and disadvantage of the proposed base case alignment versus the Grand Avenue alignment. The CBA would need to include the following costs:

- Any land acquisition required;
- Re-routing utilities from Grand Avenue. Noting that Stage 2 will need to factor in utility relocation; and
- Costs implications for redevelopment within the Priority Precinct, including delivery of more efficient development parcels, open space and community infrastructure.

R14 That the Applicant refine the general scope of the Carlingford Line corridor to achieve:

- an alignment that responds to both existing and future urban structure
- alignment with precinct planning throughout the corridor, including the Telopea Master Plan

- Design and construction of the plaza at Telopea;
- reorientation of the inward-facing corridor to provide a desirable new frontage and public address (e.g. regrading to achieve increased east-west connections, removal of fencing, etc.)
- creating a multimodal parkway characterised by
    - an overall parkland setting
    - connections between all modes which respond to principles of Universal Access, DDA and BCA compliance
    - extensive and well-connected biodiversity plantings
    - public amenities, fitness equipment and other fittings and fixtures which respond to program, including cycling infrastructure

R15 That the Applicant undertake further work in consultation with Council and relevant authorities to refine the following alignment and stop issues in the Rydalmere to Carlingford precinct:

- future-proofing for future extension of the light rail to Epping via Carlingford Court.
- demonstrating to DPE and Council that the retention of a single track at Pennant Hills Road does not compromise the future need for increased service frequencies, nor a proposed extension to Epping, and that the design and land requirements for this future-proofing are included as part of Stage 1.
- future-proofing for future stops at Telopea South and Carlingford South.
- adding a stop at WSU Rydalmere and addressing follow-on requirements of shifting the proposed Rydalmere stop location to the north and future-proofing for interchange with Parramatta Light Rail Stage 2 on South Street.

R16 That the Applicant undertake further work in consultation with Council and relevant authorities to resolve the following issues relating to connectivity in the Rydalmere to Carlingford precinct:

- Investigate delivery and/or future-proofing of the recommended links listed at Table 1 of this submission
- prepare a strategy (with resulting detailed design at construction stage) for the ATL in consultation with and to the satisfaction of the relevant authorities and Council. If the design criteria, as outlined below, are not achieved, the design of the facility shall be submitted to the Secretary for approval accompanied by justification for any changes and evidence of consultation with the aforementioned authorities and Council. The design of the ATL shall be implemented as part of the SSI. The design of the ATL must ensure:
    - maximised safety of pedestrians and cyclists, and separation of all modes wherever possible;
    - identification of urban design principles and standards based on:
        - local environmental and heritage values;
        - urban design context;
        - sustainable design and maintenance;
        - lighting;
        - community amenity;
        - permeability across the corridor, including at dedicated crossings and at light rail stops;
        - consideration of relevant design standards such as *Crime Prevention through Environmental Design Principles*;
        - future stop locations

- minimising fencing and physical barriers
- provision of appropriate landscaping, including details of existing and retained vegetation, and the proposed removal and proposed landscaping.
- the design of the ATL bridge over the Parramatta River must also:
  - consider relevant design standards such as *Bridge Aesthetics: Design Guidelines to Improve the Appearance of Bridges in NSW (RTA, 2003);*
  - have a width of at least 4 metres;
  - outline specific measures to avoid or minimise heritage impacts to heritage items in the vicinity;
- In meeting the criteria above, the following is provided to the Department to document compliance:
  - graphics such as sections, perspective views and sketches of all conditions from various viewpoints;
  - plans outlining design details of materials, colours and structures;
  - how relevant design standards and key State and Local policies have been considered and responded to in the design;
  - evidence of consultation in relation to the design of the facility.

R17 That the Applicant undertake the following work relating to Rydalmere:
- Investigate moving the Parramatta River active transport bridge element to the Eastern side of the bridge, and undertake refined design of the link between the bridge to the riverbank walk below
- Retention of heritage abutments to Parramatta River Bridge (as discussed in Section 9 of the Submission)
- In conjunction with the additional stop at WSU Rydalmere, establish a continuous north-south pedestrian link between the two Rydalmere stops, providing a western boundary and new point of orientation for the WSU Rydalmere campus characterised by mature trees.

R18 That the Applicant consult with Council in relation to the design, funding and delivery of the proposed Carlingford terminus plaza.

Recommended Conditions of Consent

C1 That the Applicant address the requirements contained in Part 3 – Design Sequences Westmead of Council's Parramatta Light Rail Stage 1 Framework – Volume 1.

C2 That the Applicant address the requirements contained in Part 3 – Design Sequences Westmead of Council's Parramatta Light Rail Stage 1 Framework – Volume 1.

C3 That the Applicant address the requirements contained in Part 3 – Design Sequences: Church Street North, Church Street CBD and Macquarie Street CBD of Council's Parramatta Light Rail Stage 1 Framework – Volume 1.

C4 That the Parramatta Square stop is relocated to west of the Civic Link, in consultation with Council.

C5 Prior to construction, the Applicant in collaboration with Council prepare a revised Master Plan for Robin Thomas Reserve for the purposes of community consultation. The Master Plan shall:
- Minimise impact on open space;

- Provide playing fields of the equivalent utility and standard to those existing on Robin Thomas Reserve; and
- Protect the existing skate park and water play park.

C6 That the Master Plan should demonstrate that there is an enhanced standard of public open space and amenity within Robin Thomas Reserve and any immediately adjoining public land.

C7 Following community consultation, the Applicant and Council agree on the public domain and built works to be funded by the Applicant. Prior to commencing works, the Applicant shall submit the final Masterplan, with a detailed schedule of works to the Secretary of the Department of Planning and Environment for approval.

C8 The Project must include repurposing the existing Sandown line to embedded tracks and a public domain treatment around the Light Rail Stop. That the treatment is reflective of a design standard within a new Town Centre setting, consistent with the Camellia Master Plan and undertaken in consultation with DPE and Council.

C9 Prior to the construction of the Camellia Stabling and Maintenance Facility, the Applicant shall prepare a detailed design. The design of the facility must be prepared in conjunction with Council and Department of Planning and Environment to ensure that facility is fully integrated with the Camellia Town Centre Master Plan. The design shall demonstrate how it addresses the following criteria:

- Creation of public streets along Grand Ave and Colquhoun Street that accommodates pedestrians, bicycles, street parking and cars;
- Provision of generous landscape setbacks, with setback secure fence from the boundary and wide footpaths;
- A legible entry for staff and visitors;
- Locating active uses and public entrances along the street with direct access off the street;
- Address principles of CPTED;
- Consider location of open space and community facilities along the Grand Ave with immediate access to the Town Centre; and
- Address the reduction of capacity within the floodplain and diversion flood waters.

C10 That the Applicant address the requirements in Council's Parramatta Light Rail Stage 1 Framework – Volume 1 relating to Design Sequences:

- Robin Thomas Reserve to Rosehill; and
- Camellia.

C11 That the Applicant address the requirements contained in Part 3 – Design Sequences: Camellia to Rydalmere and Rydalmere to Carlingford of Council's Parramatta Light Rail Stage 1 Framework – Volume 1.

C12 That prior to commencement of construction the Applicant demonstrates to the satisfaction of Council that WSU Library, Early Years' Service and Events Management, as well as Carlingford West Preschool, Scouts NSW, City of Parramatta Library and Childcare Management, has been communicated the construction schedule and have determined to their reasonable satisfaction mitigation strategies to enable them to continue their key services either on site or off site.

3. Traffic, Transport and Access

Recommendations

R19 That the Applicant undertake revised traffic modelling which includes the following inputs:
- Buses as a separate vehicle type (as opposed to general vehicle class);
- Include impacted surrounding streets - Isabella, Sorrell, Caste and Macarthur Streets, Horwood Place and the intersection of Marsden and Phillip Streets;
- Extend the model to 2036 to include projected growth in the Parramatta CBD and Westmead;
- Remove assumptions in relation to grade separation of James Ruse Dr, at Grand Ave / Hassall St;
- Include Parramatta Square and Civic Link.

R20 The Applicant assess the impact of intersection delays in and around the Parramatta CBD on the network, including increased travel distances and decreased legibility of the network. Further mitigation measures should be presented in order to reduce delays.

R21 The preliminary results of the above be presented to DPE and Council for discussion. The final results of the assessment shall be presented in a revised report.

R22 That the Applicant prepare a design for George Street in collaboration with Council.

R23 That the Applicant investigate signalising the intersection of Horwood Place and George Street, with the consideration of the Civic Link Framework Plan.

R24 That the Applicant prepare a design for the widening of Gasworks Bridge and Harris Street to demonstrate the impacts of the Light Rail alignment along this corridor and a reduced overall corridor width.

R25 That the Applicant assess the traffic and pedestrian impacts at the intersection of Robert Street and Adderton Road and consider treatment options in consultation with DPE and Council in relation to the Telopea Master Plan.

R26 Before Approval of the SSI, the Applicant prepare the Greater Parramatta Access Plan, in consultation with Council, RMS, other business units of Transport for NSW for the purposes of public exhibition. The GPAP must consider the following:
- assessing the parking impacts of light rail construction and operation and detailing processes for mitigating lost parking (this can include kerbside management plans, changing rules for remaining parking, and increasing supply of parking away from the impacted areas)
- identifying and assessing expected bus service changes and interchange arrangements both during construction and during operation.
- identifying needed upgrades to legibility and wayfinding for all modes in and around Parramatta CBD.
- identifying and planning for needed road capacity upgrades.
- identifying and planning for needed walking and cycling upgrades.
- identifying future rail provision including Sydney Metro West.

- identifying how above improvements deliver an integrated transport solution, incorporating all modes, to meet the transport needs of all users in the Greater Parramatta area.

R27 That the Applicant assess the impact on existing commuters and impact of the proposed shuttle service, in terms of frequency, travel routes and catchment area.

R28 Before approval, the proponent should undertake further assessment of parking impacts and mitigation measures in relation to the High and Primary Schools along Macquarie Street. This should be completed with Council, RMS and Department of Education and Communities.

R29 That the Applicant investigate opportunities for future provision of commuter car parking, including at Dundas, Rydalmere and other suitable locations.

R30 The Applicant is to provide more detail in regards to construction period and staged operational impacts of the Project on waste servicing and vehicle access to affected residents and businesses across all precincts. This should also be addressed in Vol 1A Management and Mitigation Measures (Section 10.12.4).

R31 That prior to determination of the EIS, a more detailed analysis of growth scenarios and likely capacity of the Project. This analysis is to be based on future growth scenarios agreed with Council at the beginning of the process.

R32 That the Applicant present to DPE and Council the analysis and measures for future-proofing the light rail for future growth scenarios. These measures should include, but not be limited to, options to enable increased frequency, additional stops and establishing an indicative future light rail network including extensions / lines for investigation.

Recommended Conditions of Consent

C13 That the Applicant the final design for George Street be approved by Council.

C14 That all works associated with the Project that are undertaken on Council roads and land be subject to approval by Council.

C15 That the Project shall be designed so that the light rail bridge accommodates the potential future grade separation of James Ruse Drive at Hassall St/ Grand Avenue.

C16 That the Project not limit the ability of the redevelopment of Riverside Theatre and the future whole or partial closure of Market Street to through traffic; and

C17 That if traffic signals at Hassall and Harris Streets are provided as part of the Project, that the Applicant prepare and implement associated local traffic measures, subject to approval through the Parramatta Traffic Committee process.

C18 As part of the Community Engagement Plan (as detailed in Section 5 of this Submission) for the Project shall ensure that it consider co-ordination of construction processes to manage cumulative impacts. This should include a strategy to ensure local stakeholders

are made aware of the activities on different sites, and how the cumulative impacts are being managed.

C19 That prior to construction, work with Council, relevant state agencies including Venues NSW, the Museum of Applied Arts and Sciences, the Australian Turf Club, NSW Health and Parramatta Park Trust to develop coordinated strategies for the easy and safe movement of traffic, pedestrians and cyclists during construction and events.

C20 The staging plan included with the CMP is to address construction projects within the Parramatta CBD to manage conflicts and develop appropriate strategies.

C21 That prior to construction, the Applicant finalise the Greater Parramatta Access Plan in collaboration with Council, RMS and Transport for NSW.

C22 That the free shuttle bus continue operation throughout construction of the light rail, using an alternative route to be designed in consultation with the City of Parramatta Council.

C23 That 6 months prior to operation of the Project, that the Applicant and Council undertake an assessment of the patronage and future role of the shuttle service to determine its future operation.

C24 That as part of the closure of the existing Clyde to Carlingford Line, the Applicant must undertake a detailed assessment of the impact on existing patrons and future transport to determine future capacity needs, including its role in an integrated transport network including Light Rail (proposed and future stages), Sydney West Metro and heavy rail network.

C25 The Applicant is to liaise with Council in relation to any amendments necessary for PLEP 2011 to accommodate reservations and acquisitions on the LRA map.

C26 The Applicant shall prepare a Parking Offsets and Management Strategy in consultation with City of Parramatta Council, including the Traffic Committee, businesses and key stakeholders. The Strategy shall include:

- Identification of strategies to identify and address parking impacts for each precinct along the light rail corridor including replacement parking, residential parking schemes, and provision of clearways.
- Impacts on mobility parking schemes

C27 During construction, the Sydney Coordination Office shall coordinate the implementation of any parking offset and management strategies and lead the consultation with affected businesses, residents and land owners.

C28 That any disabled car parking spaces that are to be lost as a result of construction be replaced as close to the site as possible, so there is no overall net loss of disabled parking spots

C29 The project and the Sydney Coordination Office should work with Council to prioritise kerb-side use and relocate uses based on mutually-agreed priorities. Any parking

mitigation measures go through the approvals processes with Council and/or RMS as road authorities.

C30 Prior to operation of the Project, the Applicant shall construct a permanent commuter car park at Carlingford for capacity of approximately 150 car spaces.

C31 Prior to operation of the Project, the Applicant shall construct a temporary commuter car park at Camellia in proximity to the Light Rail Stop.

C32 The Project shall provide for a right-hand turn from Smith Street (southbound) into Macquarie Street (westbound).

C33 The Project shall not impede the continuous and unencumbered ingress and egress of the approved Parramatta Square vehicle access to Macquarie Street throughout construction and operation of the Light Rail, unless by prior agreement with Council.

C34 Prior to commencement of works, the Applicant and construction contractors are to work with Council and its waste collection service to ensure waste collections can operate effectively during staging of construction and operation of the Project.

C35 During construction, the Applicant, ensures that accessibility of Hawkesbury Road be maintained, especially along routes to and from key hospital and institutions entrances to and from the Railway Station.

C36 Prior to Commencement of Works, a Pedestrian Access and Network Plan is to be prepared in consultation with Council, RMS and relevant Reference Groups. The Plan shall identify current and proposed pedestrian paths during construction and operation, including the facilitation of future pedestrian paths identified by both State and City of Parramatta Council with the objective of providing prioritised, seamless, coherent and safe pedestrian access throughout and adjacent to the corridor. The Plan will address:

- "access for all" ensuring those with mobility aids, wheelchairs or scooters can continue to access the corridor;
- existing and proposed local and regional pedestrian facilities and strategies;
- safety for pedestrians in pedestrianised zones;
- alternative pedestrian routes during construction based on safety and coherence, and contingencies in the event that relocated routes are found to be inadequate;
- demand for pedestrian facilities with consideration to encouraging an increased pedestrian mode share;
- signage and wayfinding along the routes;
- the requirements of relevant design standards, including Austroads and RMS guidelines.

The Applicant shall be responsible for implementing the Pedestrian Access and Network Plan.

C37 Prior to Commencement of Works, a Cyclist Access and Network Plan is to be prepared in consultation and to the satisfaction of Council, RMS, BicycleNSW and relevant Reference Groups. The Plan shall identify current and proposed cyclist paths during construction and operation, including the facilitation of future cyclist paths identified by both State and Local Government with the objective of providing seamless, coherent and safe cyclist access throughout and adjacent to the corridor. The Plan must address:

- cyclist access to all streets (including alternative solutions that allow cyclists to legally travel without dismounting along streets where general traffic lanes are removed);
- existing and proposed local and regional cyclist facilities and strategies;
- alternative cyclist routes during construction based on safety, coherence and consistency with the existing route, and contingencies in the event that relocated routes are found to be inadequate;
- demand for cyclist facilities with consideration to encouraging an increased cyclist mode share;
- bicycle storage facilities on light rail vehicles;
- best practice bicycle storage at light rail stops;
- signage and wayfinding along the routes;
- the requirements of relevant design standards, including Austroads and NSW bicycle guidelines.

C38 The Applicant shall implement the Cyclist Access and Network Plan.

C39 The Applicant shall ensure all stops are designed to ensure safety, connectivity, efficiency and convenience is maximised for pedestrian and cyclists. This includes identification of connecting paths, cycleways and appropriately located and designed bicycle parking.

C40 The Applicant to prepare a conceptual design for a future dedicated cycleway between the Tudor Gatehouse at O'Connell Street to the Active Transport Link bridge over James Ruse Drive. This route shall be developed in consultation with Council and RMS and be located along a route that would be desirable for cyclist use. Construction of the cycleway is not included as part of the SSI.

4. Urban and Technical Design

Recommendations

R33 That prior to approval, DPE and the Applicant, discuss with Council any proposed condition of consent relating design flexibility and Table 5.1.

R34 In relation to areas of project flexibility, Council requests the following amendments to the Table 5.1:

- Tree Planting outside Project Corridor: Council request that the areas identified as suitable for planting of replacement / offset trees are discussed and agreed by Council, that an offset ratio of replacement new trees for old is to be defined, and it is suggested that a ratio of up to 8 new trees for old is required.
- Survey / utility / lighting works - a 1 km radius is too great, 200m would be more appropriate.
- Substations and related utilities – Council is concerned that substations and relocation of proposed substations should not be allowed without further consultation and planning approval. These are significant structures with potentially significant impact on the public urban domain. It is noted that this element was a very significant issue on the Sydney South East Light Rail project with significant impact and adverse outcomes to the public domain in some locations.
- Road network changes including off – corridor works - There must be consultation with Council and comments taken into account and incorporated.

- New or widened bridges - New or widened bridges could have significant knock on impacts and therefore Council must be consulted and comments incorporated.

Recommended Conditions of Consent

C41 The City of Parramatta Light Rail Technical Requirements (Volume 2) are to be incorporated into the final Urban Design Requirements. That the Urban Design Requirements are finalised by Transport for NSW in collaboration with the City of Parramatta.

C42 The Applicant shall establish an Independent Design Review Panel and shall be responsible for reviewing and endorsing significant design aspects of the project. The Panel representatives shall be approved by the Secretary of the Department of Planning and Environment and comprise appropriately skilled professionals employed in the fields of architecture, landscape design and heritage. One member of the panel is to be nominated by the City of Parramatta Council.

C43 That the Applicant prepare design drawings of the following key elements for the review by Council:

- Westmead Transport Interchange
- Driver facilities at Westmead and Carlingford
- Stabling and Maintenance facility at Camellia
- Culverts
- Bridge from Westmead to Parramatta North
- Bridge over Clay Cliff Creek and James Ruse Drive
- Bridge over Parramatta River from Camellia to Rydalmere
- Bridge over vineyard creek at Rydalmere
- Bridge over Kissing Point Road, Dundas
- Modifications to Lennox Bridge
- Modifications to Victoria Road Bridge, Rydalmere
- Modifications to Kissing Point Road Bridge, Dundas
- Modifications to Adderton Road Bridge, Telopea
- Modification to Pennant Hills Road Bridge, Carlingford

C44 That the Applicant prepare detailed design drawings of key streets for on and off light rail corridor for the review by Council at the following locations:

- Hawkesbury Rd, Westmead
- Hainsworth Street, Westmead
- Bridge Rd, Westmead
- River Rd, Parramatta North
- Factory Street, Parramatta North
- Albert Street, Parramatta North
- O'Connell Street, Parramatta North and Parramatta
- Church Street, Parramatta North
- Church Street, Parramatta
- Macquarie St, Parramatta
- George St, Parramatta
- Tramway Avenue, Rosehill
- Alfred Street, Rosehill
- Converted Sandown Line, Camellia
- Grand Avenue, Camellia
- Converted T6 Carlingford Line

C45 The design of the project must ensure that re-grading of levels and finishes is not to negatively impact on the public domain including consideration of the following:

- existing trees scheduled for retention;
- access;
- drainage;
- interface with existing buildings or those in construction or with development consent;
- Universal Design Principles;

- Council's Public Domain Guidelines 2017.

C46 Key requirements regarding level changes in the public domain will include the following (in accordance with Council's Public Domain Guidelines 2017):
- No change to existing property boundary levels. Existing entries to existing properties cannot be changed.
- Pedestrian footway cross-fall between 1 and 2.5%.
- Minimum Clear Path of Travel 2.4m in Church and Macquarie Streets, and 1.8m for other locations.
- Maximum kerb height 150mm in line with typical street condition.
- Consistent longitudinal falls on all pedestrian pavements are to be maintained and/or achieved. Sudden level changes in the pedestrian pavement are not acceptable.

C47 That detailed design drawings of Light Rail Stops be produced for City of Parramatta Council's review which demonstrates the following:
- Meet accessibility requirements;
- Main path of travel between light trail stops and interchange to other modes, main streets and parking facilities;
- Promote the provision of new public domain areas, not form a barrier within the urban structure, maximise pedestrian permeability, minimise clutter and avoid the use of barriers, fences and median islands generally
- Stop platform finishes to be flush with adjacent footpaths.
- Shelter and associated furniture to follow an integrated design.
- The use of existing awnings as shelters where appropriate,
- Be responsive to local character, including heritage, as well as intermodal interchanges at the following locations:
  - Westmead Terminus
  - Prince Alfred Square Stop
  - Parramatta North Cumberland Hospital Stop
  - Church Street Stop
  - Parramatta Square Stop
  - Harris Street Stop
  - Tramway/Robin Thomas/Rosehill Stop
  - WSU/Rydalmere Stop
  - Dundas Stop
  - Carlingford Stop

C48 That the Applicant produce a stop prototype.

C49 The project shall be designed, constructed and operated wire-free from:
- Its commencement at Westmead through to corner of Factory and Church Street at North Parramatta;
- Victoria Road, Parramatta CBD to Tramway Avenue Light Rail Stop, Rosehill

C50 Where new poles are required, the design and placement of these poles as required for the operation of the light rail are to be agreed with Council. Redundant poles in the immediate vicinity (30 m) of new poles should be removed to minimise visual clutter.

C51 Where possible, the Applicant must ensure multifunction poles integrate signals, CCTV, alert high speakers, digitalised wayfinding, screen information, and lighting in order to avoid clutter of public domain.

C52 Light quality and management is to be consistent with Council's lighting requirements.

C53 The project shall be designed, constructed and operated with vegetated tracks in the following locations:

- Railway Parade to Parramatta River, Westmead
- Church Street (between Factory Street to Victoria Road)
- Macarthur Street (between George St and Harris St) along George Street and Tramway Avenue to Tramway Ave stop.
- The Parramatta North Urban Transformation project site (between Green Up Drive and Warrinya Avenue)

C54 Prior to operation, the Applicant must develop a Management Plan which demonstrates:

- Adequate irrigation and drainage is provided to ensure sustained vegetation growth and health and safe use of the space;
- Appropriate species selection to suit site conditions, including wind impacts and solar access.
- A maintenance plan; and
- Where achievable, rainwater, stormwater or recycled water should be used.

C55 The project shall be designed to maximise pedestrian permeability and ease of access to ensure that:

- Fencing and barriers are avoided;
- Pedestrian crossings, especially at major intersections, are aligned; and
- The Light Rail does not divide open space.

C56 The Applicant in their detailed design incorporate trees within the corridor in consultation with Council.

C57 The Applicant shall design Hawkesbury Road to deliver a high amenity tree lined boulevard.

C58 The Applicant shall design and deliver street planting in accordance with the requirements of Council's Public Domain Guidelines (2017).

C59 Third Party advertising shall not be permitted on light rail rolling stock, stops or bridges.

C60 That the Applicant prepare a Public Art Strategy during the detailed design stage to realise public art along the alignment and a dedicated budget. The Strategy should be prepared in collaboration with Council prior to the commencement of works.

C61 That the Applicant prepare a Heritage Interpretation Strategy which identifies opportunities for interpretation of historic built heritage or landscape or archaeology. A draft Strategy should be submitted to Council for comment prior to the commencement of works.

C62 The Applicant shall prepare in collaboration with Council a City Identity Strategy for the Light Rail to ensure that the light rail rolling stock, public art, interpretation and the light rail stops reflect the cultural and historical identity of the City of Parramatta.

C63 The Applicant shall design substations, where possible to be located underground. If above ground, substations must be designed so as to minimise size and bulk and to integrate into the surrounding context or building. The overall size and massing of the proposed substations should not be increased from what has been identified. Additional substations not identified in the application are not permitted.

5. Social and Economic Impacts

Recommendations

R35 That the Applicant revise the Social Impact Assessment to include updated demographic analysis for Carlingford to Rydalmere; Camellia and Rosehill; Parramatta CBD; Parramatta North and Westmead based on 2016 Census data, and a summary provided that identifies where the data and trends show a significant variation between 2011 and 2016 population characteristics. The 2016 information should inform and be used by the Light Rail project team to prepare and support the community throughout construction and operation.

R36 The Applicant shall engage in the Parramatta Skills Exchange program which is a program involving a partnership between Council and TAFE. The proponent will be required to meet employment and training targets that will enable a percentage of the total workforce to comprise:

- Residents of the City and greater Western Sydney to work on the Project
- Apprentices, trainees and workers updating existing qualifications or workers undertaking a new qualification.); and
- Indigenous workers.

R37 That the Department of Planning and Environment, in consultation with Council, identify Affordable Housing opportunities in the Priority Precincts along the Light Rail corridor.

R38 The project needs to clearly demonstrate no net loss of coach parking in the Parramatta CBD as a result of the light rail project. The economic modelling should undertake capacity analysis for expected growth in the tourism sector.

Recommended Conditions of Consent

C64 That prior to the commencement of works, the Applicant prepare a Community Engagement Strategy which provides for the following:

- Procedures and mechanisms for the regular dissemination of information (in English, Mandarin, Cantonese and Korean) to the community and stakeholders on construction progress and matters associated with environmental management;
- Procedures and mechanisms through which the community and stakeholders can discuss or provide feedback to the Applicant and/or Environmental Representative in relation to the environmental management and delivery of the Project including regular community satisfaction surveys;
- The retention of the current 24-hour hot line call number, website, and email contact throughout the period of construction, and the updating of the Project website in real time (i.e. when changes occur, rather than monthly;
- Provision of wayfinding advice including information updates in real time via a digital means such as mobile APPS and email or SMS alerts;

- The retention of the four Place Manager roles throughout the period of construction.
- Procedures and mechanisms to be implemented to respond to any issues/disputes that arise between parties on the matters relating to environmental management, design and the Project delivery;
- Procedures and mechanisms through which the Applicant can respond to any enquiries or feedback from the community and stakeholders in relation to the environmental management and delivery of the Project.
- A commitment to updating all communications channels frequently when new communication comes to light. Ideally the updating of channels would occur in real time for electronic communication platforms and weekly for other channels.
- A clear outline and commitment to a schedule of communication which outlines how the Project will engage with Council fortnightly meetings and weekly during construction is desirable which includes regular updates on the issues register being maintained by the Project.
- Identification of stakeholders to be targeted as part of the strategy, including community and business stakeholders, environmental and transport groups, student groups and adjoining property owners;
- Identification of high and low impact stakeholders with a clear communication schedule that outlines a commitment to how regularly information updates will be provided. It is recommended that broad based communication is quarterly but high impact users receive monthly updates and weekly updates during construction.
- Acknowledgement of students as a significant stakeholder group and a strategy for addressing this group particularly with regard to safety during construction in light of the propensity for younger age groups to use electronic devices while crossing roads.
- Acknowledgement of large employers as significant stakeholders that will require regular information and communication.
- A Business Consultation and Activation Plan that addresses access for business to a 24-hour hotline to raise any issues or concerns.
- Attendance at the Darug Reference Panel and Council's Aboriginal and Torres Strait Islander Committee on a regular basis (monthly or bi-monthly);
- Regular communication paths and rapid communication paths when significant issues affecting the Aboriginal community (including archaeology) are uncovered;
- That the Applicant provides a minimum of 7 days' notice to all relevant stakeholders within the precincts, as well as community and emergency transport services that attend the precincts, should outside of planned hours of work be required, to enable a reasonable amount of time for stakeholders to make alternative arrangements where possible;

C65 The Community Engagement Strategy is to be submitted to the Secretary of the Department of Planning and Environment and the City of Parramatta prior to the commencement of construction works and be maintained and implemented through the construction stage.

C66 The Applicant is to establish the following Reference Groups:

- A Community Reference Group which includes a range of community members from across the route and includes a range of different types of rail users e.g.

families with young children, those with a disability, tertiary students, commuters, the elderly etc.
- A business reference group that includes a good cross section of businesses.
- A Church Street working group given the high impact on business in this area.

C67 The Terms of Reference for the Reference Groups are to include the provision of advice on the business and community impacts of construction of the project and to advise of mitigation measures to avoid or minimise impacts where reasonable.

C68 The Reference Groups are to be given the opportunity to review and provide input into the development of the Community Engagement Strategy referred to above prior to its finalisation.

C69 Council is to be involved in the selection of members of the Reference Groups to ensure they are representative of impacted business and community groups along the corridor.

C70 The Reference Groups are to meet monthly and the high impact groups are to meet fortnightly during construction and when required.

C71 A copy of all public communications (digital or written) regarding progress of the light rail construction and operation is to be provided to Council no less than 5 business days prior to release, to enable consistent and timely communications with the general public by Council;

C72 A bi-monthly update meeting is to be held with Council during the construction period to ensure timely communications and ability to respond to emerging issues with a collaborative and consistent approach

C73 The Applicant is to establish a communication portal with relevant NSW based respiratory health organisations and peak bodies (including Asthma Foundation NSW), as well as the NSW Ministry of Health in order to communicate to their members when potential dust generating activities are taking place during construction.

C74 The Applicant is to attend every meeting (quarterly) of the Parramatta Region Homeless Interagency (PRHI) during the construction phase to provide an update on progress and planned activities / next steps, and to receive feedback from service providers 'on the ground' regarding any impacts or issues for homeless people or homelessness service providers resulting from the work.

C75 The Applicant is to develop a Homeless Persons Engagement Strategy in consultation with the Parramatta Region Homeless Interagency (PRHI) and Council, covering the whole of the Stage 1 area with specific focus in and around the Parramatta CBD and North Parramatta (including Prince Alfred Park).

C76 TfNSW is to fund an Assertive Outreach Officer for the period of construction to:
- build relations with homeless people and facilitate referral to services and supports,
- be the main contact with local food service providers,
- act as the link for the local homelessness sector with the light rail project, and
- support early identification of potential issues/ risks as well as options to solve matters before they escalate.

C77 Prior to commencement of construction, the Applicant is to demonstrate the following local stakeholders have been communicated the construction schedule and expectations and have determined to their reasonable satisfaction how they will be able to continue their key services either on site or off site:

- all Places of Worship;
- all childcare facilities (long day care, family day care, preschools, OOSH);
- all Nursing Homes and Aged Care Facilities;
- Council Social and Community Services; and
- all schools and universities.

C78 That the Applicant provides education and training sessions for the community to promote safe interaction with Light Rail, in partnership with relevant local organisations along the corridor, including:

- School students;
- People with a disability utilising services;
- Residents;
- Workers; and
- General public sessions.

C79 The Applicant must conduct protective security risk assessments in accordance with *Australia's Strategy for Protecting Crowded Places from Terrorism 2017* and propose suitable treatments to mitigate identified risks. This is in addition to any general CPTED assessments conducted, although there may be commonalities in treatment options.

C80 The Applicant is to consult with Council to identify how best to integrate public safety systems such as CCTV to provide better coverage and situational awareness.

C81 The Applicant and Council should also consider sharing CCTV monitoring facilities to reduce capital and operational costs and assist both parties to meet their obligations under *Australia's Strategy for Protecting Crowded Places from Terrorism 2017.*

C82 The applicant is to undertake an Economic Impact Modelling Assessment to determine the range and extent of the potential negative impacts within specific business precincts along the Project corridor.

C83 The Applicant is to prepare a Business Management Plan, detailing relevant plans and programs that specifically address economic impacts and provide costed business continuity strategies for the commercial centres on the corridor, particularly the Parramatta CBD. The Plan should be prepared in consultation with Council, affected stakeholders, the Business Reference Group and the Church Street Working Group. Ongoing implementation of the Plan should be also done in consultation with these groups.

C84 The Applicant shall provide a Construction Management Plan to detail how construction works will be managed in order to minimise impacts to existing businesses located in the vicinity of construction sites and activities during construction of the Light Rail. The plan shall include measures to minimise business related impacts, maintain vehicular access and pedestrian access during business hours and maintenance of the visibility of the business appropriate to, its reliance on such. The Plan shall be prepared in consultation with the Business Reference Group and Council and shall include, but not necessarily be limited to:

- Business management strategies for each construction site (and/or activity) identifying affected businesses and associated management strategies including employment of place managers and specific measures to assist small business owners adversely affected by the construction:
- A monitoring program to assess the effectiveness of the measures including nomination of performance parameters against which the effectiveness of the measure will be measured
- Provision for reporting the monitoring results to the Secretary of the Department of Planning and Environment of the Compliance Tracking Program.
- Implementation of a regular research program. Quarterly surveying of businesses to understand impacts on businesses and to identify opportunities for improvement and to be able to respond to issues. Survey to include satisfaction with communication and engagement and impact on business such as loss of parking, financial and access issues. This information is to be shared with Council and key stakeholders including business reference groups.

C85 The Construction Management Plan (CMP) is to include a staging plan. The staging plan is to be prepared in consultation with Council and relevant parties. The staging plan and CMP should specifically address issues relating to business and events, particularly in the Parramatta CBD. Where possible, construction activity along Eat Street is to be staged in short sections so as to avoid works during key event and festival periods, or extending festivals and events to surrounding streets to encourage footfall along Eat Street (Church Street). Additionally, the design of the construction and hoardings (i.e. utilising transparent barriers to maintain sightlines across the street) is to be sympathetic to the area.

C86 Prior to Commencement of construction, the Applicant is to prepare detailed economic impact mitigation and management measures which are tailored to key institutions, such as Western Sydney University, University of New England, Westmead Hospital and Rosehill Gardens Racecourse and reflects a detailed understanding of respective needs and potential impacts.

C87 The Applicant shall erect construction hoarding or fencing along Church Street no more than 48 hours prior to commencing works in order to minimise the impact on the public domain and business operations. That the use of construction fencing will maintain sightlines across the street.

C88 That the Applicant include the process to engage Council and other major event organisers as part of the Construction Management Plan.

C89 That the project operational hours be 24-hours, 7 days a week, at a frequency that is compatible with the type of workers and visitors along the corridor.

6. Property and Development Impacts

Recommendations

R39 That the Applicant partially acquires Lot 1 DP 126881 from Council.

R40 That the Applicant resolve vehicle access issues to properties bounded by Arthur, Alfred, and George Streets, and Tramway Avenue.

R41 The Applicant must provide further information regarding procedures for the cessation of outdoor dining licenses. In particular, it must be clarified how TfNSW will engage with business owners regarding Outdoor Dining licenses and the impact of the Light Rail Project.

R42 The Applicant must provide further information regarding procedures for the removal and replacement of outdoor dining structures and building awnings by the Applicant, including cost and consistency with the agreed design.

R43 The Applicant is to provide further information clarifying the number of properties which are to be acquired (such that the maps and tables presented in the EIS are clearly aligned).

R44 The Applicant is to advise whether Council is required to be involved in any land acquisition agreements or subsequently, with regard to the ongoing use of the land.

R45 That the Applicant continue to liaise with Council and the NSW Lands Department regarding the Aboriginal Land Claim at Robin Thomas Reserve.

R46 That there is clear definition between RMS and Council's assets and infrastructure, including responsibility for design checks, conditioning and maintenance works;

R47 That, in consultation with Council, the Applicant conduct pavement investigation and testing and prepare a Pavement Design Report that will provide information on existing pavements and changes that will be required. The report must include:

- the proposed pavement structure for each road section or part of the road section along the corridor and off-corridor road sections that will be affected by the Project,
- discussion of each element of the pavement design system shown in Figure 2.1 of Austroads' Pavement Design Guide (project reliability, construction and maintenance considerations, environment, subgrade evaluation, pavement materials and design traffic)
- full road cross sections for each different configuration
- demonstration that the load bearing capacity of roads are not reduced
- all background data (e.g. traffic surveys and studies, geotechnical investigation, field and laboratory testing etc.), assumptions and calculations in the design process and nominated construction specifications.

R48 That further information be provided to Council regarding how access will be maintained to schools in a safe manner and how Light Rail construction will affect the high-rise redevelopment of the Arthur Phillip High School, as well as how the school development may impact the Light Rail construction.

Recommended Conditions of Consent

C90 Prior to Commencement of Works, the Applicant is to prepare in consultation with Council a subdivision plan which clearly addresses the size, location, ownership and future use of any residual lots. The plan is to incorporate a strategy for dealing with any small or undevelopable lots with landscaping or other public domain solutions, including plans for long-term maintenance.

C91 That the Applicant implement a system which involves Council to ensure ongoing coordination with proximate Development Applications and Planning Proposals, including construction coordination, public domain delivery, traffic impacts and other matters.

C92 That both physical and legal access to the Sydney Water boat ramp and to Lot 102 DP840898 is maintained throughout construction and operation. If physical and legal access to Lot 102 DP840898 cannot be maintained, the Applicant must acquire the property.

C93 That the Applicant, in consultation with Council, develops and implements a Property Acquisition Engagement Plan, including a dedicated Property Acquisitions Manager role.

C94 That the Applicant include Council as a key and main stakeholder in all design and construction works on and off alignment in similar capacity as RMS.

C95 That, prior to construction, a dilapidation report is required for:

- Existing Council assets including roads, footpaths, and drainage;
- Existing buildings (private and commercial) that will be within construction zone and affected by vibration at construction stage and operations;
- Any heritage buildings and other structures, as above.

C96 That the Applicant include Council in handover of relevant assets and infrastructure upon completion of the works

C97 That road opening permits are sought from Council where required.

C98 The Applicant is required to carry out a survey and prepare a plan and detailed design, satisfactory to Council, of all bus and related facilities that are affected by the Light Rail Project, including a proposal for replacement, reinstatement, and/or restoration (as necessary) of these facilities. This is to be implemented prior to commencement of operation of the Light Rail.

7. Heritage and Archaeology Impacts

Recommendations

R49 That the Applicant, in consultation with Council, provide a revised Aboriginal Cultural Heritage assessment report which meets SEARs 9 (Heritage) by:

- Providing the test excavation methodology as an appendix to the assessment document.
- Undertaking further historical research and archaeological analysis, to determine the available extent of primary evidence related to the history of the area, including known and potential sites, persons and archives.
- Revising the heritage assessment to consider Aboriginal contact period history and the known and potential heritage values and archaeological evidence associated with places and locations within the rail corridor.
- Undertaking an assessment of the cumulative impacts of the project to Aboriginal cultural heritage, and the PSB/PSS, in accordance with best practice for cultural heritage, OEH policy, the objectives of the NPW Act, and SEARs 9.2.
- Demonstrating attempts to minimise harm to Aboriginal cultural heritage, the PSB/PSS, and notably the SHR item 01863., and provide methodologies to enable conservation and redesign prior to construction. Impacts to the PSB/PSS within the SHR curtilage should be avoided. If the project boundary cannot be altered, options for avoiding direct impact need to be explored. Given the extent of fill over the PSB in this location (KNC 2017, Figure 21), an assessment of engineering options should be made to avoid direct impact to the PSB, leaving it in situ below the proposed development.

- Revising the Salvage Excavation Methodology (Appendix E) to provide a context and justification for salvage extents and methodology, including defined start and end points, and the reasons for potential expansion. (KNC 2017, 90). Methodology should provide for more extensive salvage excavation in accordance with standard practice in NSW, particularly in areas of known significance, such as Robin Thomas Reserve.
- Revising the ARD to allow for mechanical excavation of the layer of fill across the PBS/PSS, which does not need to be hand excavated. This should be undertaken under the supervision of a qualified archaeologist.
- Providing specific methodologies for contact period archaeological sites in Parramatta, and the salvage excavation of other types of archaeological evidence present within the PSB/PSS, including ochre deposits, manuported stone (noting that any stone manuported within the sealed deposits was brought by Aboriginal people), hearths, ground ovens, and heating pits.
- Revising the methodology defining the program of scientific analysis, including geomorphology, with OSL dating, particle size analysis, and palynological analysis. Analysis and assessment of excavated assemblages of historical objects to determine their age and significance as potential contact period objects (under both Aboriginal and historical archaeological methodologies).
- Revising the methodology to provide a management and mitigation strategy that allows for archaeological testing to determine the presence of the PSS through parts of the study area (KNC 2017, Figure 2) which cannot be assessed at the current time (i.e. below existing roads) notably through the centre of Parramatta south of the river.

R50 That the Applicant provide a revised Historical Archaeology Assessment to meet the SEARs by:

- Undertaking further historical and archaeological analysis, including primary research, comparative analysis, detailed archaeological assessment and historical map overlays. Include discussions regarding contact archaeology in the assessments.
- Revising the assessment to address the numerous contradictions and inconsistencies between the methodology and terminology presented in Section 2.0 and the archaeological impact assessments presented in Section 5.0, and within the assessments in Section 5.0.
- Incorporating assessments and results from key projects such as Parramatta North Urban Transformation (PNUT), Arthur Phillip High School (APHS), Endeavour Energy's transmission upgrades and Kelleher Nightingale Consulting's (KNC) Aboriginal heritage report (in particular the testing results) for this project. These reports and information are available online (UrbanGrowth and Major Projects websites) and through the Heritage Division library and the City of Parramatta Research Services Library at 346a Church Street, Parramatta. They could also be requested from the consultancies who prepared them.
- Reviewing the level of significance for archaeological sites dating to the 1840s in Parramatta North. Current understanding is that archaeological remains relating to early nineteenth-century development north of Parramatta River are of state significance.
- Revising management measures and zones to include more specific procedures for Historical Archaeological Management Units (HAMUs) with state significant and/or intact archaeology. Prince Alfred Square, Queens Wharf Reserve and Robin Thomas Reserve should be maintained as conservation areas. These should have specific management recommendations to promote conservation outcomes as required by the SEARs (9.2 (c) and (d)).
- Revising management measures to include specific principles and policies for design and for construction, as two different processes, which link to key archaeological sites and HAMUs (in particular the state significant sites). The management

measures should also consider the different stages and components of the Light Rail Project, such as early and investigation works, which occur as prior to construction.

R51 That the HIA be revised to meet the relevant SEARs and the NSW Heritage Council Guidelines in relation to mitigation measures for heritage items, in particular for:
- Lennox Bridge
- Cumberland East Hospital Precinct
- Prince Alfred Square
- Robin Thomas Reserve
- Dundas Station

R52 That the Applicant investigate and present to Council and DPE alternatives to avoid the demolition of the listed heritage items Royal Oak Hotel, abutments of 'Camellia (Parramatta River) Underbridge, and abutments of Clyde Carlingford Bridge.

R53 Where the Applicant cannot avoid demolition of the Royal Oak Hotel, any remaining property (including the Stables) that is not required for ongoing operation of the project shall be converted to public domain, dedicated to Council and incorporate heritage interpretation.

Recommended Conditions of Consent

C99 That, prior to construction, the Applicant shall prepare a Cultural Landscape Study for the light rail route encompassing the Aboriginal historic, social and aesthetic values. The study should include recommendations for acknowledgement and interpretation of significant Aboriginal cultural heritage values. The study should be completed within 12 months of the project approval, by a suitably experienced heritage professional with skills in Aboriginal historical research, community engagement, intangible cultural heritage, oral history and cultural mapping. This study should contextualise the Aboriginal history and heritage values known to exist within the city of Parramatta, and should provide the scope for the recording of associated oral histories with members of the local Aboriginal community. The Cultural Landscape Study should inform the Interpretation Plan for the project, which should address integrate heritage values across the study area. These studies should inform the detailed design for the landscaping and urban design components of the project.

C100 That, prior to construction, the Applicant shall undertake consultation with Council as part of the Cultural Landscape Study to ensure consistency with internal strategies for heritage management and interpretation within the LGA.

C101 That, prior to construction, the Applicant shall undertake additional test excavation within PADs 3, 5 and 6. This can occur concurrently with the post approval mitigation (KNC 2017, Appendix E), which is required for PADs 1 and 2, AHIMS 45-6-3195 and, subject to impacts being approved within the SHR curtilage, the Robin Thomas Reserve.

C102 That, prior to construction, the Applicant shall undertake test excavations to identify the PSS through parts of the study area which cannot be investigated as part of the EIS, prior to the commencement of construction. Sufficient time and resources must be allowed for archaeological investigations to be completed in accordance with the ARD.

C103 That, during construction, the Applicant shall implement the revised methodology for the investigation of Aboriginal archaeological sites to be impacted by the project

C104 That, following construction, the Applicant shall prepare a final Aboriginal archaeological investigations report within 12 months of completion of archaeological fieldwork. The

final report should be prepared to current NSW OEH standards and requirements. It should include, but not be limited to, detailed and illustrated description of archaeological findings, registers (features, photo, samples, plans), specialist reports, artefact catalogue and analysis, site photographs, interpretive illustrations, scaled drawings and surveys (including orthophotographs) and response to research questions. The final report should also include a digital archive of all site records including plans, photographs, high resolution orthophotographs, any 3D scans taken, monitoring notes and field notebooks. The final report should also identify the location and details of the long term storage for Aboriginal objects. The final report should be submitted to the City of Parramatta Research & Collection Services Area Library, the NSW OEH, and a suitable online repository as agreed by Council.

C105 That the Applicant consult with Council's Darug Reference Panel and Aboriginal and Torres Strait Islander Committee regarding Aboriginal Cultural Heritage matters in relation to the Light Rail Project.

C106 That, prior to construction, precinct-based Archaeological Research Designs must be prepared (rather than one document for the entire project). This would allow for more detailed archaeological impact analysis and specific archaeological management and methodologies. The ARDs should include methodologies to enable conservation and redesign prior to construction, detailed archaeological investigation methodologies in accordance with best practice and also include specific methodologies for contact period archaeological sites in Parramatta. The ARDs should be submitted to the NSW Heritage Division for approval prior to construction.

C107 That, prior to construction, archaeological test investigations must be undertaken at state significant HAMUs and key locally significant HAMUs prior to finalising design and construction commencement. The results should inform construction methodology options to avoid impacts to state significant and intact locally significant archaeological sites. The redesign process should include consultation with the NSW Heritage Division and Council.

C108 That, prior to construction, an Interpretation Strategy is prepared in consultation with Council, NSW Heritage Division, Aboriginal stakeholders and other key stakeholders. The Interpretation Strategy should adopt a cultural landscape approach and include archaeological findings. The Interpretation Strategy should identify opportunities in the design to incorporate interpretation, such as at stops or within carriages.

C109 That, during construction, the archaeological mitigation methodologies of the non-Aboriginal Archaeological Research Designs for each precinct shall be implemented.

C110 That, during construction, an Interpretation Plan which includes detailed content and design shall be prepared in conjunction with the Project design team. Detailed content and concept designs should be approved by Council's interpretation specialist and the NSW Heritage Division. The Interpretation Plan should provide details of how interpretation would be implemented.

C111 That, following construction, a final non-Aboriginal archaeological investigations report shall be prepared within 12 months of completion of archaeological fieldwork. The final report should be prepared to current NSW Heritage Division standards and requirements. It should include, but not be limited to, historical analysis, detailed and illustrated description of archaeological findings, Harris Matrices, registers (context, photo, samples, plans), specialist reports, artefact catalogue and analysis, site photographs, interpretive illustrations, scaled drawings and surveys (including orthophotographs) and response to research questions. The final report should also

include a digital archive of all site records including context sheets, plans and section drawings, photographs, high resolution orthophotographs, 3D scans, monitoring notes and field notebooks. The final report should also identify the location and details of the artefact repository. The final report should be submitted to the City of Parramatta Research & Collection Services Area Library, the NSW Heritage Division library and a suitable online repository as agreed by Council.

C112 Prior to construction, all relevant requirements under NSW Heritage Act and NSW National Parks and Wildlife Act, as appropriate, are to be satisfied.

C113 Any historical fabric which may eventually be approved for damage or destruction is to be archivally recorded, and records deposited in the Parramatta Heritage Centre.

C114 Prior to construction, that the Applicant engage a suitably qualified person to undertake a structural adequacy assessment during the construction and operation of the project on Lennox Bridge.

C115 That the project be designed, constructed and operated wire free from its commencement at Westmead through to corner of Factory and Church Street at North Parramatta, and at Victoria Road from Parramatta CBD to Tramway Avenue Light Rail Stop, Rosehill (as per Section 4 of this submission). Wire free sections of light rail along the interface of St Patricks Cemetery, Prince Alfred Square, Queens Wharf Reserve and Robin Thomas Reserves are required to minimise visual impacts and tree pruning.

C116 The Prince Alfred Square Stop shall be designed to ensure impacts on the heritage listed items are minimised including:

- Designed so to not impact the historic geometry of the park.
- Protection of historical structures, including the War Memorial and trees during works;
- Minimise use of fencing and other barriers; and
- Minimal signage, with fully transparent shelters to minimise visual intrusions.

C117 Prior to construction, detailed investigations are required to confirm the location of burials along the western boundary of the state heritage listed St Patricks Cemetery to ensure that the proposed works will not result in any significant impacts.

C118 Prior to construction, a detailed design is required for St Patricks Cemetery, Prince Alfred Square, Queens Wharf Reserve and Robin Thomas Reserves which minimises the use of fencing and other barriers along the interface of these spaces to reduce visual impact and maximise pedestrian permeability and universal access.

C119 That the Project avoids the Grave of Eliner Magee and Child with a protective buffer area provided around its curtilage. The Project shall allow a reasonable separation between the route and the item.

C120 Prior to works commencing, Condition assessments are to be prepared for all assets and infrastructure on open space land in consultation with Council. Assessments are to include furniture, soft and hard landscaping, heritage structures, turf and tree condition, paving / pathways, signage, fencing, gates and lights.

C121 To minimise impacts on St Patricks Cemetery, Prince Alfred Square, Robin Thomas Reserve and Queens Wharf Reserve, a Landscape & Temporary Works Management Plan must be prepared and implemented as part of the Construction Environmental Management Plan. It is to ensure that:

- Excavation and trenching are to be minimised;

- Site sheds and other temporary works facilities are to be installed above existing grades to prevent soil compaction;
- Laydown and loading areas are to be located away from trees to avoid the need for tree pruning and reduce risk of soil compaction;
- Vehicle access to work sites shall be located away from mature trees as much as possible;
- Rehabilitation and landscaping of impacted areas following completion of works.

C122 Site specific tree protection plans shall be prepared and submitted to Council for approval in accordance with AS 4970:2009 (Protection of Trees on Development Sites) for the following public spaces:

- St Patricks Cemetery
- Prince Alfred Square
- Robin Thomas Reserve
- Queens Wharf Reserve

8. Sustainability Impacts

Recommendations

R54 That the Applicant provide the Sustainability Strategy, as drafted, to the Council for review as part of the EIS process.

R55 That the Applicant provide to Council for review as part of the EIS process:

- Assumptions used to generate the Greenhouse Gas Emissions (GHG) modelling for the construction and operation of the Parramatta Light Rail
- The score card and total points to achieve an "excellent" rating under the ISCA scheme.
- The Project's response to the NSW Government Resource Efficiency Policy (GREP) requirements.
- The Project's response to the NSW Climate Change Policy Framework and its renewable energy and climate resilience targets.

Recommended Conditions of Consent

C123 That, in the consultation with relevant agencies and Council, the Applicant prepare a Sustainability Strategy for the construction and operation of the Project.

C124 The Project must achieve a minimum 65 or "excellent" rating at the design, as built and operation stages.

C125 The Applicant shall comply with Transport for NSW's Sustainable Design Guide Version 4 and achieve a minimum gold rating for this State Significant Infrastructure.

C126 The Project at a minimum offset all GHG emissions from its operation.

C127 The Sustainability Strategy must include a GHG emissions plan in consultation with Council for the lifecycle of the project construction that includes:

- All GHG emissions from the Project
- Setting best practice energy efficiency, greenhouse gas emission and renewable energy targets at the construction and operation stages of the Project.
- The renewable energy target should match Council's 50% renewable energy target for the operation of the Light Rail project including the use of photovoltaic cells at

the stabling and maintenance facility and installation of small scale solar and LED lights at all rail stops, energy efficient design of buildings above minimum NCC standards, within the stabling and maintenance facility).

- Procurement must demonstrably address:
  - energy efficient rolling stock and maintenance equipment (such as air conditioning, ventilation fans with smart temperature set points, insulation and weight considerations for rolling stock).
  - Energy efficient electrical equipment as per GREP and meeting the minimum improvement for operational energy for buildings as per the GREP.
  - Use of construction equipment/plant that is fuel efficient and can run on biofuels
  - Use of low embodied energy and recycled materials at light rail stops.
- Evaluation and reporting on the feasibility of identified opportunities be carried out during detailed design and documented in an energy and greenhouse gas strategy.
- Remaining GHG emissions (from gas and other fuel sources if any) be offset using GreenPower
- Establish a monitoring and public reporting framework for resource consumption and GHG emissions.

C128 The Applicant must incorporate climate change adaptation in the Sustainability Strategy for the project. The Strategy shall specifically address:

- The risks of urban heat during construction and operation phases
- Provision of natural and artificial shading and cooling devices in and around stations to improve pedestrian and light rail user comfort
- Disruption to operations caused by heat related passenger illness.
- Address how infrastructure and materials associated with the Project is future proofed for a 50-year horizon taking into account predicted climate change such as increased rainfall intensity, flooding events, urban heat, extreme heat days, heatwaves, wind gusting, and severe storms.

C129 That the Applicant include in the Sustainability Strategy:

- Potable water and alternative water supply targets;
- Consider high WELS ratings for all water using appliances;
- Rainwater harvesting and recycled water infrastructure at the stabling and maintenance facility to provide non-potable water supply for, at least, toilet flushing, carriage washing and irrigation. A recycled water pipeline currently exists close to the stabling facility which could meet all the non-potable water demand at the facility;
- Water monitoring, via a comprehensive metering/sub-metering scheme; and
- Transparent reporting of mains potable and recycled water usage in the operational phase

C130 Where available, and when of appropriate chemical and biological quality, subject to a health risk assessment, stormwater, recycled water, and groundwater inflows to tunnels or other water sources shall be used in preference to potable water for construction activities, including concrete mixing and dust control.

C131 DPE should reflect standard Conditions of Consent for waste and resource management for the project.

C132 All Light Rail Stop facilities are to have general rubbish bins and recycling bins.

9. Flooding and Water Quality Impacts

Recommendations

R56 City of Parramatta Council has not adopted the Draft 9 MIKE 11 flood model or reports. Only the formally adopted Draft 8 model and its outputs should be used for this study.

R57 Prior to determination, the Applicant must submit a redesign of the stabling and depot facility at Camellia to provide flood protection for all flood events up to and including the PMF. This must allow for major flood flow conveyance under the building structure(s) without obstruction, and must minimise flood impact. No filling of the site or the surrounding access areas is to be undertaken.

R58 Prior to determination of the EIS, the Applicant must prepare to concept viability level an appropriate and coordinated approach to emergency response and risk management due to flooding, during both operation and construction. This is to be done in consultation with Council and SES.

R59 The Project is to utilise appropriate monitoring devices and connect to the latest local flood warning system (FloodSmart) which provides timely data and allows the greatest possible response time in a flash-flood event. Becoming part of the FloodSmart program will allow the Project to identify additional flood triggers and better respond to flood events. While the EIS includes a Stormwater and Flooding Management Plan, it is recommended that Council be consulted on this to ensure that all issues – including flood monitoring and warning systems - have been addressed appropriately.

R60 The Applicant must consider the requirements of Council's *Draft Best Practice Urban Design in Flood Prone Areas – Urban Design Strategy* (2016, prepared by Architectus and Cardno) into all relevant aspects of the project, as required by the SEARs. This document will be provided to the Light Rail Project team by Council.

R61 Further detail about how operational water quality impacts from the stabling facility at Camellia will be managed is required, as this facility is a large impervious area where maintenance activities could result in surfactants, oils, heavy metals, and other toxic chemicals being released into waterways during routine operations, and also during major floods.

R62 The Applicant must demonstrate to concept viability level an approach to WSUD across the Project which conforms to Council's DCP requirements and meets local water quality goals and metrics, such as those outlined in Council's *Environmental Sustainability Strategy* and by the Parramatta River Catchment Group.

R63 That, prior to determination and in consultation with Council, the Applicant is to demonstrate through more detailed modelling how the Project addresses flooding and stormwater management issues in Macquarie Street. This must include opportunities for integration with drainage and overland flow from Parramatta Square, amplification of drainage lines in Macquarie and Smith Streets or other adjacent routes, and location, design and management of safe stormwater surcharges. Redesign may be necessary.

Recommended Conditions of Consent

C133 All newly created results of survey work, models, model outputs or asset inventory data are to be provided to Council for its use as they are generated.

C134 The Applicant must prepare and submit to DPE and Council a detailed, comprehensive hydraulic flood model that includes the impacts of both mainstream (fluvial) flooding impacts from Parramatta River and its tributaries, local overland (pluvial) flooding from local catchments, and hydraulic stormwater drainage pit and pipe model for all drainage infrastructure impacted by the Light Rail project. The model must include the following:

- a review of all previous flood study information obtained from Local Land; Services to ensure it is consistent with Council's adopted flood information results Draft 8 MIKE 11, released by the Upper Parramatta River Catchment Trust;
- pre- and post-development catchment study scenarios which include the Light Rail network and structures, and other known significant developments proposed in the catchment;
- the modelled impacts of all new, modified and existing PLR infrastructure including form loss coefficients for bridges;
- the impacts of climate change and sea level rise;
- all scenarios based on new AR&R 2016 methodology, confirm peak design flows and adopt the high result for use in final design of the drainage and overland flow network;
- accurate topographic survey;
- overland flow modelling for the 1% AEP and the PMF pluvial and fluvial events assuming 100% pit and pipe or bridge blockage at critical locations;
- extended building polygons data include the Carlingford sub-catchment;
- all missing pit and pipe stormwater drainage information (the collection of this information is to be undertaken by a Registered Surveyor and must include all stormwater drainage inlet pit capacities, and a detailed hydraulic grade line analysis that takes appropriate account of all hydraulic pit losses, pipe losses, pit and pipe network geometry and tail water conditions); and
- a calibration of the flood and drainage model using historical flood events and rainfall information.

C135 Prior to commencement to works, the Applicant clearly respond to SEARs 10 (Flooding), and demonstrates that all relevant flood-related planning and development controls have been addressed under *Current Guidelines* including:

- Local Floodplain Risk Management Policy;
- Local Environmental Plans (LEPs);
- Development Control Plans (DCPs);
- Lower Parramatta River Flood Study and Management Study and Plan;
- Adopted Upper Parramatta River Flood Study and Management Study and Plan;
- Draft Update of Parramatta Floodplain Risk Management Plans; and
- the NSW Floodplain Development Manual.

C136 Prior to commencement of works, Applicant must submit to Council and DPE final detailed flood modelling and design which demonstrates the following:

- the Project will not materially adversely impact on existing flood characteristics (such as flood inundation extents, alterations to flood flows and velocities, changes to flood levels or hydraulic flood hazard flow conditions) along the full extent of the project or elsewhere outside of the project boundary for all flood events up to and including the PMF.
- the effective protection of all critical rail infrastructure components for all flooding by adequately addressing:
    - daily operational requirements during typical rain events;

- localised flooding in events of 5% to 1% AEP; and
- extreme flood events greater than the 1% AEP up to and including the PMF.

C137 The Applicant must investigate and report on further advice stated in AR&R 2016 and other industry accepted recommended guidelines on acceptable safe levels of hazard flow criteria, and appropriate considerations made in final design of the Light Rail Project.

C138 The Applicant must clearly address and mitigate issues at all areas where the current flood modelling reports increases in flood depths, in particular;

- Caroline Street (Westmead Precinct) – increase in water levels of up to 200 mm in a 1% AEP event
- Road within Cumberland Hospital (Parramatta North Precinct) – increase in water levels up to 160 mm in a 1% AEP event.
- Ross Street / Sorrell Street (Parramatta North Precinct) – localised increase in water levels up to 100 mm in a 1% AEP event.
- Victoria Road (Parramatta North Precinct) – localised increase in water levels up to 170 mm in a 1% AEP event.
- George Street between Purchase Street and Alfred Street – (Rosehill and Camellia Precinct) – increase in water levels at private properties of up to 80 mm in a 1% AEP.
- Rydalmere stop (Carlingford Precinct) – increase in water levels western side of up to 400 mm in the 0.2EY event.
- Leamington Road pedestrian underpass (Carlingford Precinct) – increase in peak water level of approx. 400 mm in the 1% AEP event.
- Adderton Road north of Kissing Point Road intersection (Carlingford Precinct) – increase in peak water level of approx. 180 mm in the 1% AEP event.
- Winter Street (Carlingford Precinct) – increase in peak water level of approx. 180 mm in the 1% AEP event.
- Adderton Road south of Cumberland highway (Carlingford Precinct) – increase in peak water level of approx. 400 mm in the 1% AEP event.

C139 That, two years prior to operation, Applicant must prepare a detailed and comprehensive Flood Emergency Response and Operational Risk Management Plan and accredited Management System for the entire Light Rail system addressing at a minimum:

- emergency planning during construction and repairs
- anticipation and preparedness for significant flood events
- flood warning systems
- LRV emergency movement planning
- staff training
- passenger/staff protection, evacuation and rescue

C140 In consultation with SES, Council and any other relevant emergency authorities, the Applicant must demonstrate that the design of the network is consistent and integrated with all other emergency plans and emergency response agencies.

C141 Water level sensors are to be placed at key flood locations to automatically monitor water levels. These must be coordinated from a central control room, and data from these sensors is to be made available to Council and SES to assist with flood management.

C142 All emergency response, or change in service due to flood risk or other emergency, is to be coordinated from the control room and not left to individual drivers.

C143 Light Rail operations must sign up to the FloodSmart (FISH) local Parramatta early flash flood warning service, and the operator must consult with the Parramatta River Flood Information System steering group (to gain access to automated partner alerts, review the effectiveness of warnings, etc.).

C144 The Applicant is to consult with Council on the Stormwater and Flooding Management Plan to ensure all issues have been addressed appropriately.

C145 That the Applicant prepare an interdisciplinary Water Sensitive Urban Design Strategy for the entire Light Rail Project, which is implemented through detailed design and addresses:

- water quality improvement, ecological services, landscape values, social amenity and flood resilience
- commitment to the implementation of all WSUD measures suggested in the EIS, which form a basic sustainable water management strategy.
- integrated landscaping, bio-retention and grassed/vegetated track areas to maximise pervious surface and deep soil area.
- vegetated trackways must be maximised. Pervious trackways in the form of permeable pavement should be used where vegetated trackways are not feasibly achievable. Areas which cannot be created as permeable must grade to bio-retention planters and tree pits along the side of the tracks designed with capacity to take all low flows up to the 1 in 3 month (4EY) storm event. Appropriate drainage of these elements must be shown, connecting to the trunk drainage system.
- Demonstration of how the water quality improvement targets outlined in Council's DCP 2011 will be achieved, through MUSIC (or equivalent) modelling.

C146 In support of the Water Sensitive Urban Design Strategy and Detailed Design, the Applicant must submit to DPE and Council details of deep soil and rainwater infiltration, bioretention systems, maximising permeable surface treatments, retention of trees, substantial new plantings, and rainwater harvesting.

C147 Watercourse crossings (temporary and permanent) shall be designed in consultation with NOW and Council, and where feasible and reasonable, be consistent with the Guidelines for Controlled Activities, Policy and Guidelines for Fish Friendly Waterway Crossings (NSW Fisheries 2004) and Policy and Guidelines for Design and Construction of Bridges, Roads, Causeways, Culverts and Similar Structures (NSW Fisheries, 1999). Where multiple cell culverts are proposed for creek crossings, at least one cell shall be provided for fish passages, with an invert or bed level that mimics creek flows.

C148 The Applicant is to prepare and implement a strategy for litter management and protection of waterways during operation of the Light Rail.

C149 All topographical and drainage changes associated with the Light Rail Project must be adequately addressed and appropriately integrated within the surrounding catchment and road system in accordance with Council's standard design requirements.

C150 Existing drainage assets directly impacted by the Light Rail must be replaced in a manner compliant with the relevant policy and legislative context, including current Australian Rainfall and Runoff guidelines, Council's requirements (CBD Master Drainage Plan and other plans/requirements) and the NSW Floodplain Development Manual.

C151 All stormwater drainage system elements are to achieve a minimum 5% AEP (inclusive of the upper bound of the 0.2EY climate change impacts), in accordance with Council requirements. This includes the upstream and downstream sections of drainage network identified to ensure future proofing across the light rail and to prevent any potential increase in flooding elsewhere in the catchment.

C152 The Applicant is to provide information to Council on proposed pit inlet details, pit and pipe invert levels, pipe sizes etc. for the rail corridor and downstream off-corridor drainage network.

C153 The Applicant is to undertake hydraulic analysis and design of the stormwater drainage system for the minimum 5% peak design storm to achieve a safe overland flow path for the 1% AEP peak design flows, and confirm the adequacy of the proposed stormwater drainage network to achieve the immunity required.

C154 The Applicant is to undertake in consultation with Council detailed design relating to flooding and stormwater management issues at Macquarie Street.

C155 A Water Quality Monitoring Program shall be prepared and implemented to monitor impacts on surface and groundwater quality resources and wetlands, during the construction phase. The program shall be developed in consultation with the EPA, DPI (Fisheries), Council and the Parramatta River Catchment group and shall include:

- identification of surface and groundwater quality monitoring locations which are representative of the potential extent of impacts;
- identification of the water quality parameters to be monitored at each location;
- identification of works and activities during construction, including emergencies and spill events, that have the potential to impact on surface water quality of potentially affected waterways;
- presentation of parameters and standards against which any changes to water quality will be assessed, having regard to the principles of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* (ANZECC, 2000), the aims of Council and PRCG to return swimming to the Parramatta River, and identification of 'trigger points' for further investigation or actions;
- representative background monitoring of surface and groundwater quality parameters to establish baseline water sampling during background, and construction monitoring periods;
- a minimum monitoring period of three years following the completion of construction or until the affected waterways and/or groundwater resources are certified by an independent expert as being rehabilitated to an acceptable condition;
- contingency and ameliorative measures in the event that adverse impacts to water quality relevant to the SSI are identified;
- reporting of the monitoring results to the Department, EPA, DPI, NOW, Council and the Parramatta River Catchment Group; and
- litter management, location of Gross Pollutant Traps and other pollution control devices.

C156 The program shall be submitted to the Secretary of DPE for approval prior to the commencement of construction, or as otherwise agreed by the Secretary. A copy of the Program shall be submitted to the EPA, DPI (Fishing and Aquaculture), NOW, Council and the Parramatta River Catchment Group prior to its implementation.

C157 That regular reporting and meetings (at least quarterly) to discuss water quality results and possible changes to construction practices to improve water quality be held between the applicant and Council during the construction phase.

C158 Soil and water management measures consistent with *Managing Urban Stormwater - Soils and Construction Vols 1 and 2, 4th Edition* (Landcom 2004) shall be employed during construction to minimise soil erosion and discharge of sediment and other pollutants to land and/or water.

C159 For those construction compounds within 100m of a waterway, TfNSW will consult with Council to identify any additional actions that will be needed to reduce the risk of any pollution from the compounds reaching the waterway.

10. Utility and Services Impacts

Recommended Conditions of Consent

C160 Within three months of approval, the Applicant shall establish a Utilities Management Group (UMG) to provide input to the detailed design and construction of the SSI. The UMG shall:

- Be comprised of:
  - representatives from the Applicant, including the person responsible for detailed design;
  - representatives from the relevant Councils;
  - representatives from each utility or service organisation owning assets that will be directly or indirectly impacted by the construction or operation of the SSI; and
  - independent experts as selected by the Applicant where relevant.
- Meet at least once each month for the duration of the construction of the SSI; and
- Within three months of the establishment of the UMG, review, provide advice and agree upon the detailed design of the SSI in relation to these assets through the following:
  - review of existing services within and surrounding the Light Rail corridor including identification of areas of utility congestion;
  - identification and documentation of opportunities for the development of a combined services route within the Light Rail corridor to optimise the efficient use of land surrounding the corridor and address future utility capacity requirements. This shall include identification of opportunities for incorporating utilities or services outside of the immediate impact footprint of the Light Rail corridor;
  - development of the detailed design including alignment within the Light Rail corridor and cross section for the combined services route; and
  - agree to the long term UMG consultation process and management agreement of the combined services route

However, if at the end of this period, the UMG members cannot agree on the detailed design for the combined services route, then any party may refer the matter to the Secretary for resolution.

Note: The Applicant may, in consultation with the Secretary, combine the function of the UMG with the function of other utility/service consultative mechanisms in the area, however, if it does this it must ensure that the above obligations are fully met in the combined process.

C161 The Applicant shall identify utilities, services and other infrastructure and property potentially affected by construction to determine requirements for access to, diversion,

protection, and/or support of the affected infrastructure. Consultation with the UMG and the relevant owner and/or provider of services that are likely to be affected by the SSI shall be undertaken to make suitable arrangements for access to, diversion, protection, and/or support of the affected infrastructure as required. The Applicant shall ensure that any disruption to any service is minimised and shall be responsible for advising impact service recipients prior to any planned disruption of service. The cost of any such arrangements shall be borne by the Applicant, unless otherwise agreed with the utility/service provider.

C162 The design and construction of the SSI shall facilitate the development of a combined services route with the aim to minimise future disruptions to public space and in consultation with the UMG.

C163 All underground services works are to be done at the same time or earlier as construction of Light Rail works, while footpaths are closed to public for general use.

C164 All new/relocated services shall be placed minimum of 400mm below finished road/footpath level

C165 All new drainage pipe and culverts to be minimum 600mm below the finished designed levels.

C166 All drainage works inclusive pipes, culverts, drainage pits and grates and subsoil drains to Council and AusSpec standards (refer to Volume 2 of the Urban Design Framework for more information).

C167 All drainage design shall be approved by delegated Council officer. All construction of new/augmented drainage shall be inspected and approved by relevant council officer.

C168 Locations and details of all utilities works shall be recorded (including type and size, number of conduits and other relevant data as per Australian standards), and Work As Executed (WAE) plans are to be sent to relevant authorities and Council for information and future use.

C169 In case of the construction of a new drainage pipe on top of the existing service, adequate bridging construction is required to both Council and service authority detail and approval. All utility works to relevant Australian Standards, guides and individual service authority requirements. Construction is to follow AusSpec Utility Guide.

11. Biodiversity Impacts

Recommendation

R64 In accordance with SEARs Section 12, all Threatened Species listed in the *NSW Threatened Species Conservation Act 1995* identified in *Table D.1 – Fauna species likelihood table* as being either of Moderate or High Likelihood of Occurrence need to be adequately addressed by the Applicant within the EIS or with an Assessment of Significance. The species that this relates to are:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Spotted Black Cockatoo (*Calyptorhynchus lathami*)
- Varied Sittella (*Daphoenositta chrysoptera*)
- White-fronted Chat (*Epithianura albifrons*)
- Little lorikeet (*Glossopsitta pusilla*)

- Little Eagle (*Hieraatus morphnoides*)
- Powerful Owl (*Ninox strenua*)
- Scarlet Robin (*Petroica boodang*)
- Yellow-bellied Sheathtail bat (*Saccolaimus flaviventris*)
- Greater Broad-nosed bat (*Scoteanax rueppellii*)
- Dural Land Snail (*Pommerhelix duralensis*)

Recommended Conditions of Consent

C170 That no loose materials are to be stockpiled within the Vineyard Creek Reserve compound to minimise potential impacts on the nearby Sydney Turpentine-Ironbark Forest EEC. Compound location must also ensure that pedestrian access is maintained along the pathway located on the eastern boundary.

C171 That the design of the new bridges over Parramatta River and Vineyard Creek incorporate suitably dimensioned cavities and lattice structures underneath to provide important low maintenance roosting habitat for threatened microchiropteran bats.

C172 A Flora and Fauna Management Plan must be prepared and implemented by the Applicant as part of the Construction Environmental Management Plan to detail how impacts on ecology will be minimised and managed. It must be prepared by a suitably qualified and experienced ecologist in consultation with Council, and must include, but not be limited to:

- Procedures for the clearing of vegetation and the relocation of flora and fauna;
- Procedures for the demarcation and protection of retained vegetation, including all vegetation outside and adjacent to the construction footprint;
- Plans for impacted and adjoining areas showing vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities have been recorded;
- Identification of measures to reduce disturbance to sensitive fauna;
- Rehabilitation details, including identification of flora species and sources, and measures for the management and maintenance of rehabilitated areas (including duration of the implementation of such measures);
- Weed management measures focusing on early identification of invasive weeds and effective management controls;
- Procedure for dealing with unexpected identification of Endangered Ecological Community (EEC) or threatened species during construction;
- Auditing and monitoring requirements.

12 Tree Impacts

Recommendation

R65 That the Applicant provides further detail to Council about tree impacts, including:

- A consolidated total number of trees to be impacted, including clarifying the numbers and extent of “minor”, “more than minor” and “full removal” impacts;
- Assessment of significance of all impacted trees (i.e. high, medium or low); and
- Demonstrate how significant trees have been considered for retention.

Recommended Conditions of Consent

C173 Prior to construction, the Applicant prepares a revised tree survey, which is undertaken by a qualified ecologist, to identify the type and location of hollow bearing trees that will potentially be impacted by the Project and recommended mitigation strategies, for

example nesting boxes. The survey and recommended mitigation strategies shall be submitted to Council for review.

C174 All retained street and park trees within or in proximity to works are to be physically protected by implementing tree protection measures in accordance with AS4970:2009 (Protection of Trees on Development Sites).

C175 Site specific tree protection plans shall be prepared and submitted to Council for approval in accordance with AS 4970:2009 (Protection of Trees on Development Sites) for the following public parks and places:

- St Patricks Cemetery
- Prince Alfred Square
- Robin Thomas Reserve
- Queens Wharf Reserve

C176 The Applicant shall prepare and implement a Vegetation Offset Strategy to outline how the vegetation impacts of the project will be compensated for within and adjacent to the corridor. The Strategy shall be prepared prior to construction and the removal of any tree and vegetation, and shall be prepared in consultation with Council and be developed in accordance with Transport for NSW Vegetation Offset Guide (2013) and Council's Parramatta Ways (2017). The scope of the Vegetation Offset Strategy shall include:

- The identification of the exact extent and types of tree and vegetation impacts as a result of the final design of the project;
- Detail the mitigation measures, including locations and vegetation, which will offset the removal.
- The consideration of the following vegetation programs as part of the strategy:
  - Existing high value trees being retained and protected for the duration of the project.
  - Replacement tree planting. Small trees (<20sqm canopy area), unhealthy trees or trees that do not contribute to the desired future character of streets, plaza's and public squares are replaced with appropriate trees that will help to achieve the 40% canopy cover by 2050 (refer Council's Environmental Sustainability Strategy 2017).
  - Relocation of high value trees
  - Tree planting in streets, plaza's and public squares
  - Tree planting in parks
  - Revegetation in bushland reserves to improve biodiversity and restore habitat.
  - Reservation of land in close proximity of the Light Rail corridor for biodiversity offset or conservation
- A communication strategy aimed at planning tree and vegetation planting in consultation with the local community.
- Measurement for the management, protection and monitoring of the vegetation for a minimum of two years.
- Timing and responsibilities for the implementation for the provisions of the Strategy.

13. Environmental Management

Recommendation

R66 That prior to determination of the EIS, the Applicant shall clarify the triggers for and extent of involvement of the Site Auditor.

Recommended Conditions of Consent

C177 A Construction Environmental Management Plan (CEMP) is to be prepared during the detailed design phase for implementation through all construction activities and submitted to the DPE for approval. Council is to be consulted in the preparation of the CEMP.

C178 Prior to the commencement of construction, the Applicant shall prepare a Construction Noise and Vibration Management Plan. Council shall be provided a draft of the Plan for review and comment. This shall include procedures for dealing with potential impacts during out of hours work and minimising sleep disturbance as per the guidance provided in NSW Environmental Criteria for Road Traffic Noise (ECRTN) (EPA, 1999).

C179 The CNVMP should apply all feasible and reasonable work practices to meet the Noise Management Level (NML), where possible, and inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels, duration of noise generating construction works, and contact details during construction. Where NML's are shown to continue to be exceeded, individual management strategies will need to be developed with these residences/locations to ensure an acceptable outcome for the community.

C180 The use of noise intensive plant items should be scheduled for construction hours (7am to 6pm). If the works cannot be undertaken during these hours, they are to be completed before 10:00pm.

C181 Where vibration intensive works are required within the safe working distances, vibration monitoring or attended vibration trials shall be undertaken to ensure that levels remain below the cosmetic damage criterion.

C182 Building condition surveys should be completed, where necessary, both before and after the works to identify existing damage and any damage due to the works.

C183 Lower vibration generating items of excavation plant and equipment, such as smaller capacity rock-breakers or concrete crushers/pulverisers in place of rock-breakers, should be used where possible.

C184 Prior to operation, the Applicant shall prepare and implement an Operational Environmental Management Plan (OEMP), which shall address noise and vibration issues associated with the operation of the light rail. Council shall be provided a draft of the Plan for review and comment.

C185 Following 12 months of operation of the Parramatta Light Rail, the Operator shall prepare a noise and vibration validation report in accordance with the requirements of the Operation Environmental Management Plan. Council shall be provided a copy of the draft Report for review and comment.

C186 For airborne noise created by rail operations on surface track, noise trigger levels (as defined in the OEMP) are applicable. If these are exceeded, either at opening or at an

indicative time in the future (taken to be ten years after opening), consideration of noise mitigation is required to be considered.

C187 Prior to the commencement of operation, the Applicant shall undertake more detailed investigation into the potential for ground-borne noise impacts, including measurement of existing internal and external noise and vibration levels due to the existing road and rail traffic. These investigations would inform the required resilient track form design in these locations and confirm the appropriateness of the ground-borne noise design goals. A copy of this investigation shall be provided to Council for review.

C188 Prior to commencement of construction the Applicant shall provide 'at receiver' structural noise mitigation treatment measures to buildings identified as likely to experience noise level exceedances resulting from the Project's operation.

C189 Validation monitoring and reporting prior to commencement of operation shall include noise impacts from substations to ensure that noise impacts have been appropriately mitigated.

C190 Prior to final design of the Stabling and Maintenance Facility, the Applicant shall undertake noise and vibration assessment based on future surrounding land uses in consultation with the Department of Planning and Environment as part of the Camellia Priority Precinct process.

C191 Prior to the commencement of construction, the Applicant shall provide any noise mitigation treatments to those residential and other sensitive land uses identified along the corridor as likely to experience noise level exceedances resulting from the PRL operation. This condition shall not preclude the Applicant from other reasonable mitigation measures for those properties that are exposed to high levels of construction noise over long periods from the Project.

C192 That prior to construction of the Project, a preliminary soil investigation must be conducted of the route to evaluate the suitability of the land for its intended use. The preliminary soil investigation shall be conducted by a suitably qualified person(s) in accordance with the NSW Environment Protection Authority's *Guidelines for Consultants Reporting on Contaminated Sites.* The preliminary investigation is essentially a desktop exercise with the objectives of:

- Identifying potential contamination sources, nature of contamination and the affected areas;
- Highlight areas of potential contamination which may be intercepted by the Parramatta Light Rail corridor design;
- Inform the Parramatta Light Rail risk register(s) and the various phases of intrusive investigation (Concept Design and Procurement Phase).
- Prior to the construction of the Parramatta Light Rail including decommissioning of the existing Clyde to Carlingford heavy rail corridor a detailed contaminated site investigation must be conducted by a qualified and experienced land contamination consultant and a draft and final report of the investigation must be supplied to the appropriate regulatory authority.
- Draft remediation action plans and validation plans must be submitted to the appropriate regulatory authority and Site Auditor for approval prior to commencement of remedial works;
- All remedial works must be carried out in accordance with clauses 17 and 18 of State Environmental Planning Policy 55 - Remediation of Land;
- Where the remedial action has been carried out, a validation report must be submitted to the appropriate regulatory authority stating that the objectives in the

RAP have been achieved and the land is remediated to standard suitable for the proposed land use; and

- The Applicant shall engage a NSW EPA accredited auditor to undertake an independent review of the site investigation, remediation action plan and validation reports to address the requirements of section 47(1) (b) of *the Contaminated Land Management Act 1997*. A site audit statement is to be submitted to the appropriate regulatory authority prior to commencement of construction works verifying that the primary consultants work complies with all appropriate laws, standards, procedures and relevant NSW Guidelines.

C193 That during remedial works the Applicant must engage an Independent Licensed Asbestos Assessor to ensure asbestos removal does not pose a risk to health and safety during remediation of the route.

C194 That all fill imported onto the project area is to be virgin excavated natural material or excavated natural material (VENM or ENM) and shall be certified as such by a suitably qualified industry professional. Fill imported on to the site shall also be compatible with the existing soil characteristic for site drainage purposes.

C195 That all waste soil material disposed of offsite must be classified according to the NSW EPA Waste Classification Guidelines and waste classification certificates must be submitted to the appropriate regulatory authority. Note that the NSW environment protection legislation require transporters to use the EPAs WasteLocate to record details of all consignments of asbestos waste within NSW, where the load is greater than 100 kilograms or 10 square metres.

C196 That, once inherent risk levels are finalised for all AEIs, all of the mitigation and management measures for the project should be documented in a Construction Contaminated Land Management Plan (CCLMP) which forms part of the overall Project's Construction Environment Management Plan (CEMP). This CCLMP should be provided to Council for review and comment prior to construction commencing.

C197 That an Unexpected Finds Protocol be implemented and incorporated into the CEMP for the entire Project.

C198 That the applicant prepares a contamination communication strategy and undertakes a communication and engagement program to ensure that all site contamination risks are communicated effectively and consistently to all stakeholders, especially local residents and business owners.

C199 That all measures advised in Technical Paper 9 to address air quality impacts are incorporated into the Project.

C200 That the measures advised in Technical Paper 9 are reviewed and updated as detailed design information becomes available, and that any further assessment regarding air quality impacts is to be provided to Council for review and comment.

C201 Prior to the commencement of construction of the SSI, or as otherwise agreed by the Director General, the Proponent shall nominate for the approval of the Director General a suitably qualified and experienced Environmental Representative(s) that is independent of the design and construction personnel. The Proponent shall employ the Environmental Representative(s) for the duration of construction, or as otherwise agreed by the Director General. The Environmental representative(s) shall:

- be the principle point of advice in relation to the environmental performance of the SSI;
- monitor the implementation of all environmental management plans including but not limited to the Greenhouse Gas Emissions, Water Use, Climate Change Adaptation, Biodiversity, Flood Risk Management and monitoring programs required under this approval and advise the Proponent and Council upon the achievement of these plans and programs;
- have responsibility for considering and advising the Proponent on matters specified in the conditions of this approval, and other licenses and approvals related to the environmental performance and impacts of the SSI;
- ensure that environmental auditing is undertaken in accordance with the Proponents Environmental Management System(s);
- be given authority and independence to advise on reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts; and
- be consulted in responding to the community concerning the environmental performance of the SSI where the resolution of points of conflict between the Proponent and the community is required.

Appendix B Parramatta Light Rail Stage 1 Framework Plan – Volume 1

Appendix C Parramatta Light Rail Stage 1 Technical Requirements – Volume 2