NSW GOVERNMENT

Transport for NSW

Sydney Park Junction

Walking, cycling and public domain improvements

Review of Environmental Factors

August 2021

Sydney Park Junction

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Transport for NSW

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Transport for NSW | July 2021

Prepared by Jacobs and Transport for NSW

Note: The Sydney Park Junction has previously been known as the King Street Gateway Project. Any reference to this previous project name within documents is in connection to the currently named Sydney Park Junction.

Document controls

Approval and authorisation

Title	Sydney Park Junction review of environmental factors
Accepted on behalf of Transport for NSW by:	Panduka Manamperi *Acting Senior Project Manager*
Signed:	
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Executive summary

The proposal

Transport for NSW proposes to improve the southern 'gateway' to King Street, Newtown by reducing the capacity of Princes Highway and Sydney Park Road and enhancing pedestrian and cyclist access between King Street, St Peters Station and Sydney Park. The Sydney Park Junction - Walking, cycling and public domain improvements proposal (the proposal) is located about four kilometres south west of the Sydney Central Business District (CBD), in the suburbs of St Peters, Newtown, Erskineville and Alexandria along the boundary between the Inner West and Sydney Local Government Areas (LGAs).
The key features of the proposal include:

- Reducing the Princes Highway/King Street carriageway from six lanes (generally) to four lanes(two lanes off-peak) from Campbell Street to Sydney Park Road, to accommodate a two way on-road segregated cycleway (on the western side of King Street between May Street and St Peters square), additional landscaping and community spaces to increase urban amenities
- Reducing the Sydney Park Road carriageway from four lanes to two lanes to accommodate a permanent solution for the existing temporary two-way on-road segregated cycleway (northern side), parking and additional landscaping to increase urban amenities,
- New mid-block pedestrian shared crossings to improve access across the Princes Highway/King Street and into Sydney Park, including:
    - A new mid-block pedestrian crossing on Princes Highway north of Short Street.
    - A new mid-block pedestrian and cyclist crossing on Princes Highway between May Street and Goodsell Street.
- Traffic signal and intersection reconfiguration works to improve safety, including:
    - Princes Highway/King Street and Sydney Park Road intersection:
        - King Street southbound approach: Reduce existing three though lanes and one left turn slip lane to a one through lane and one through/left turn lane
        - King Street northbound approach: Maintain existing two through lanes and reduce existing two dedicated right turn lanes to one lane
        - Sydney Park Road approach: Reduce existing two left turn lanes and two right turn lanes to one left turn lane and one right turn lane
        - Replacing existing signalised pedestrian crossing facilities with signalised shared crossing facilities on all approaches
    - Princes Highway/King Street and Goodsell Street intersection:
        - New raised zebra crossing to prioritise pedestrians at the entrance of Goodsell Street

    - Princes Highway/King Street and May Street intersection:
        - Removing traffic signals and re-configuring May Street to left in and left out only movements with a new raised zebra crossing to prioritise pedestrians at the entrance of May Street
    - Princes Highway/King Street and Barwon Park Road intersection:
        - Installing new traffic signals with new pedestrian crossings
    - Sydney Park Road and Mitchell Road intersection:
        - Eastbound approach: Reduce existing two though lanes and one left turn lane to one through lane and a through/left turn lane
        - Westbound approach: Reduce existing one right turn lane, one through lane and one through/left turn lane to one through/right turn lane and one through/left turn lane
        - Mitchell Road approach: Change existing one right turn lane and one right/through/left turn lane to one bus dedicated right turn lane and one through/left turn lane
- Reducing the posted speed limit on Princes Highway from 60 kilometres per hour to 40 kilometres from Campbell Street to Goodsell Street
- Sydney Park carpark access on Kings St will be modified so that Barwon Park Road access will be entry only into the carpark, and King Street will be exit only from the carpark
- Adjustments and relocation of parking spaces along the road corridor
- Road re-surfacing at signalised intersections and along road corridor where required
- Providing dynamic community spaces on both sides of Princes Highway
- Providing landscaped buildouts on Sydney Park Road and Princes Highway
- Relocating the bus stops on Princes Highway near the Short Street intersection, and on Sydney Park Road near the Mitchell Road intersection
- Relocating utilities and adjustments to streetlights where required
- Removing the Princes Highway and Sydney Park Road corridors from the approved B-double freight access network
- Adjusting stormwater to accommodate designed works
- Relocating existing VMS and CCTV camera
- Relocating road signs and line marking works
- Temporary construction facilities, including site compounds and an ancillary facility at Burrows Road and Venice Street, Mascot.

Construction is expected to commence in early 2022 and would take around 20 months to complete.

Need for the proposal

Sydney Park Junction is located at the intersection of three major road conduits (King Street, Princes Highway and Sydney Park Road), a significant cultural precinct, public transport infrastructure hub and one of the city's major green open spaces, Sydney Park.

The transformation over time of the Princes Highway from a local road to a major metropolitan conduit, leading directly into King Street and around Sydney Park, has made the area traffic-intensive and an inhibitor to urban activity and pedestrian and bicycle movement.

High traffic and freight volumes on Princes Highway and Sydney Park Road, combined with limited pedestrian crossing opportunities or cycling access, are presently creating an unsafe environment for all road users. Current crash rates involving cars, motorcycles and cyclists are higher than would normally be expected for similar roads in Sydney.

The opening of the M8 Motorway (Stage 1), St Peters Interchange and associated local road upgrades have altered traffic patterns in the area, with Euston Road and Campbell Street/Campbell Road replacing Sydney Park Road and Princes Highway as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. Approval conditions for the M8 Motorway (Stage 1) project also specify the introduction of traffic calming initiatives along Princes Highway, improvements in accessibility to Sydney Park and the provision of upgraded cycle and pedestrian facilities.

The proposal is required to improve the safety, performance and efficiency of the Princes Highway and Sydney Park Road intersection. The proposal would also improve urban amenity around Sydney Park by providing better pedestrian and cycling facilities and improved urban landscaped areas for the benefit of the local community and visitors.

Proposal objectives

The objectives of the proposal include:

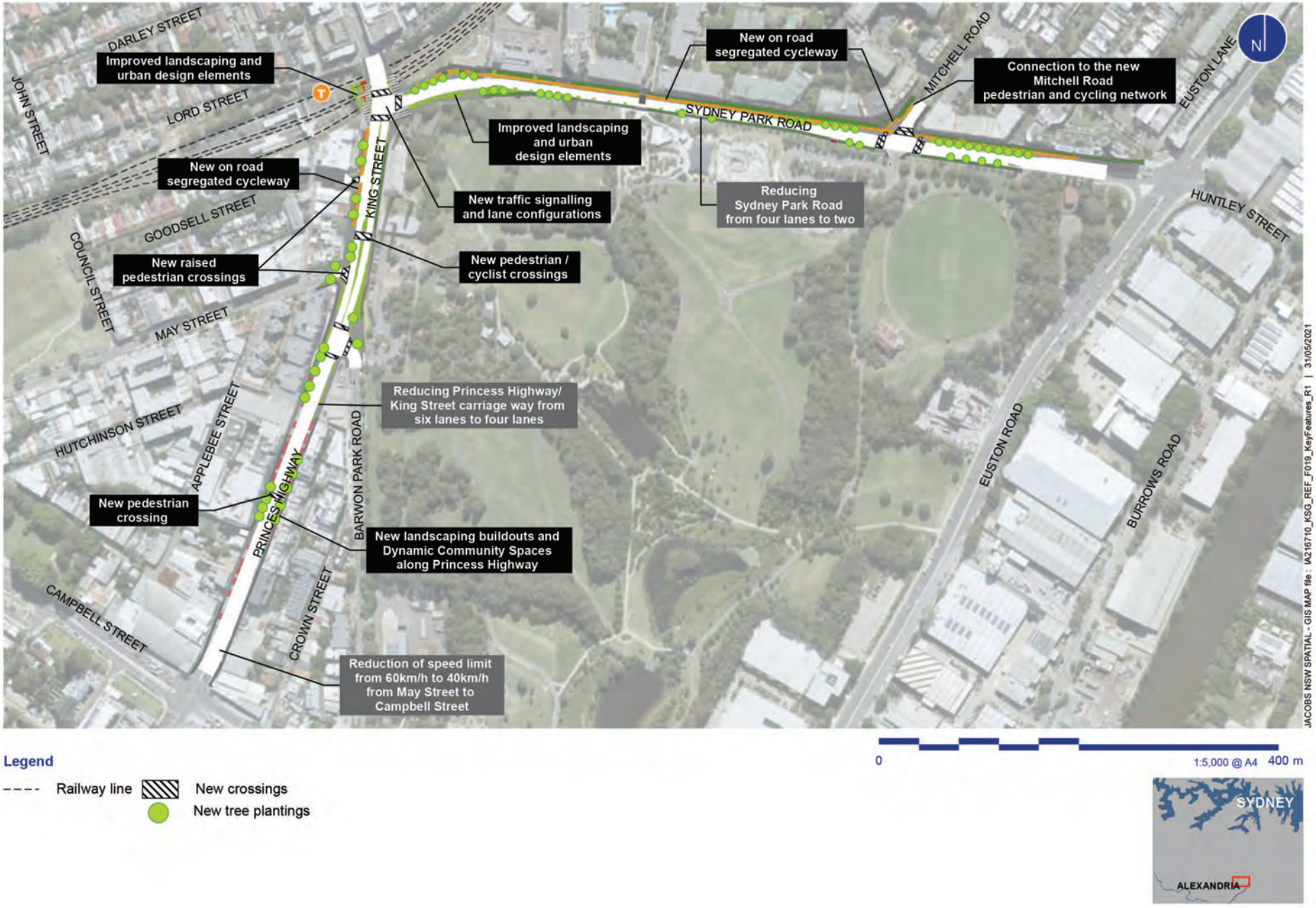
- Improve the amenity of the 'gateway' to King Street by enhancing the urban amenity of the area around the entry to St Peters station, and access to Sydney Park along Princes Highway and Sydney Park Road to provide an improved pedestrian environment
- Transform King Street and Sydney Park Road to achieve a better-balanced movement and place outcome
- Improve cyclist movement and safety in the area, particularly to Sydney Park and to St Peters Station
- Improve pedestrian and cycling connectivity to Sydney Park and improve the place environment of King Street, Princes Highway and Sydney Park Road
- Improve road safety for all customers
- Minimise the environmental impact of the development.

Options considered

Four options for the use of the residual road space (generated from the lane reductions) were considered during the development of the proposal. These options were similar in overall design but differed in terms of the locations where footpaths would be widened and width of the central median strip between the northbound and southbound traffic lanes.

The ‘do nothing’ option was also considered. This involved not undertaking any works and maintaining the existing road alignment, lane configurations, public space deployment and active transport arrangements.

Each option was assessed in terms of its ability to meet the proposal objectives. The preferred option was selected as it had the least environmental impact to existing green spaces and heritage items along the alignment and offer the best solution to meeting the objectives of the proposal and supporting the relevant regional planning policies outlined in Section 2.1.1. Figure 1 and 1a below details the key design features of the proposal.


DARLEY STREET
Improved landscaping and urban design elements
JOHN STREET
LORD STREET
New on road segregated cycleway
GOODSELL STREET
COUNCIL STREET
New raised pedestrian crossings
MAY STREET
HUTCHINSON STREET
APPLEBEE STREET
New pedestrian crossing
PRINCES HIGHWAY
CAMPBELL STREET
CROWN STREET
KING STREET
BARWON PARK ROAD
Improved landscaping and urban design elements
New traffic signalling and lane configurations
New pedestrian / cyclist crossings
Reducing Princess Highway/ King Street carriage way from six lanes to four lanes
New landscaping buildouts and Dynamic Community Spaces along Princess Highway
Reduction of speed limit from 60km/h to 40km/h from May Street to Campbell Street
New on road segregated cycleway
SYDNEY PARK ROAD
Reducing Sydney Park Road from four lanes to two
MITCHELL ROAD
Connection to the new Mitchell Road pedestrian and cycling network
EUSTON LANE
HUNTLEY STREET
EUSTON ROAD
BURROWS ROAD
N
JACOBS NSW SPATIAL - GIS MAP file : IA216710_KSG_REF_F019_KeyFeatures_R1 | 31/05/2021
Legend
Railway line
New crossings
New tree plantings
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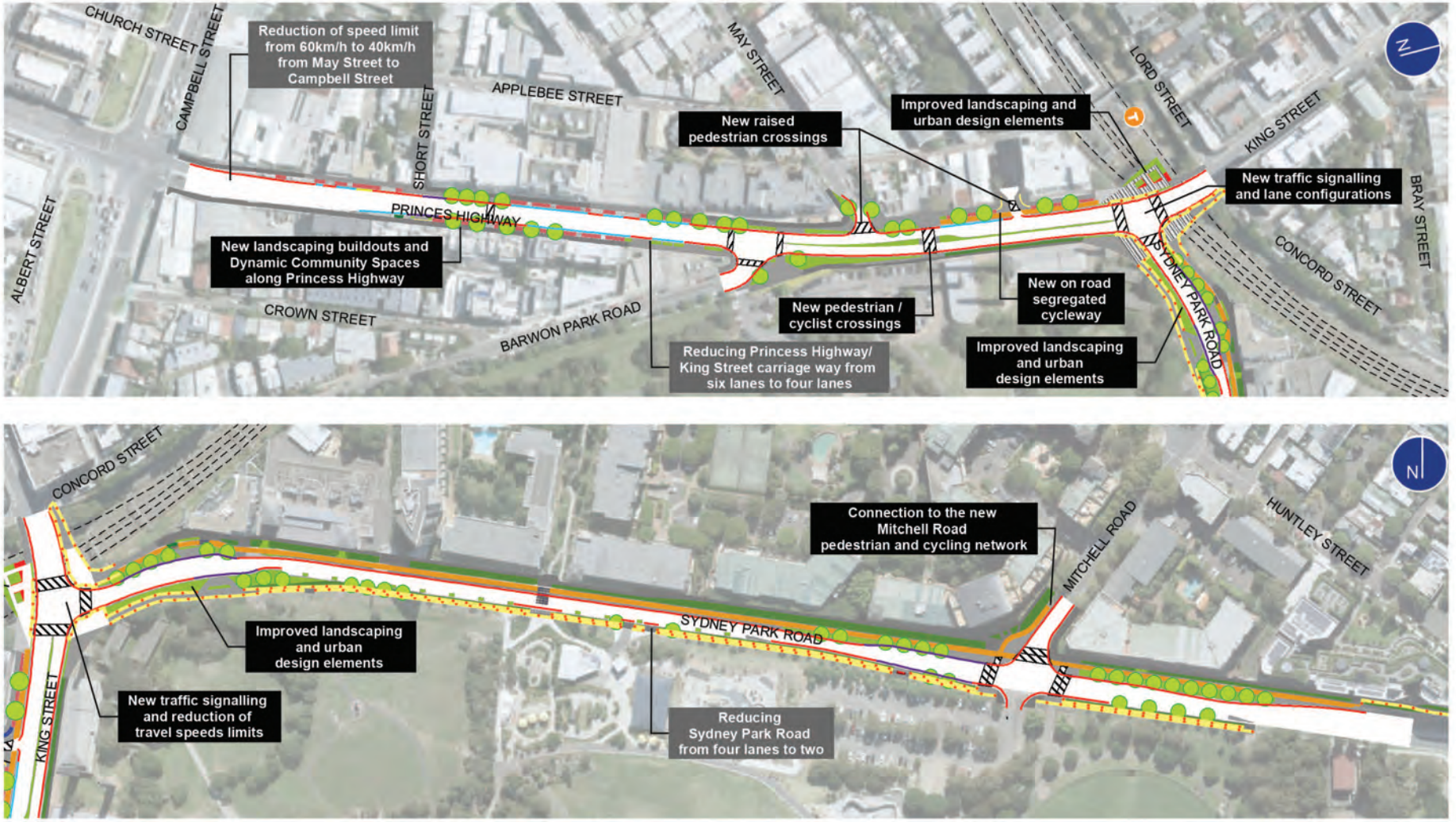
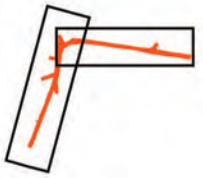
SYDNEY
ALEXANDRIA



Legend

Railway line
Bus zone
Mail zone
No stopping zone
Parking permitted
Proposed shared path
New crossings
New tree plantings



Statutory and planning framework

Clause 94 of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for the purpose of a road and road infrastructure and is to be carried out by Transport for NSW, development consent from City of Sydney Council or Inner West Council is not required. The proposal is not State significant infrastructure or State significant development and can be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Transport for NSW is the determining authority for the proposal. Transport for NSW has formed the view that the proposal is not likely to significantly affect the environment and would not require the preparation of an Environmental Impact Statement (EIS). This REF has been prepared as part of the assessment process.

Community and stakeholder consultation

During development of the proposal, Transport for NSW has consulted with City of Sydney Council and Inner West Council on an ongoing basis and engaged with stakeholder groups including NSW State Emergency Service (SES) and Sydney Trains. In response to the feedback from the councils, the proposal was changed in key areas including maintaining existing hydrological flows, improving access to Sydney Park and reducing impacts to non – aboriginal heritage items along the alignment

This REF will be publicly displayed for comment from 16th July 2021 to 14TH August 2021 during which time the community and customers will be invited to submit feedback to help Transport for NSW understand what is important and how we can improve the delivery of this project.

During this period a Project Infoline (1800 684 490) and email address (projects@transport.nsw.gov.au) will also be available for members of the public to make enquiries.

Transport for NSW will review and assess all feedback received during the public display period, prior to determining whether or not to proceed with the Proposal.

Should the Proposal proceed to construction, the community will be kept informed throughout the duration of the construction period.

Figure 2 shows the planning approval and consultation process for the Proposal.

You can provide feedback by:

• Emailing: projects@transport.nsw.gov.au

• Writing to Sydney Park Junction, Project Manager, 71-79 Pyrmont Bridge Road, Pyrmont NSW 2009

• In person at our community information session, from 2 pm to 7 pm on Wednesday 4th August 2021 at the Sydney Park Pavilion, Sydney Park, unless this is impacted by COVID-19 restrictions.

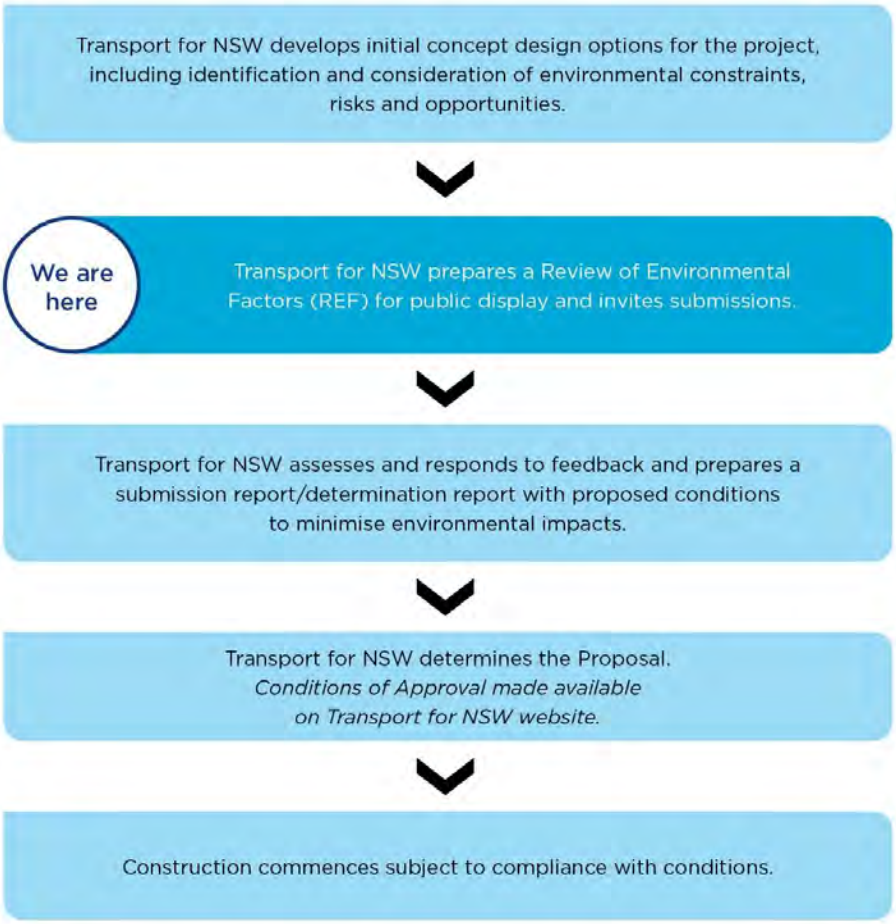


Figure 2 Planning approval and consultation process for the proposal

Following public display of the REF, all comments received would be recorded and addressed in a Submissions Report detailing how each issue raised would be considered in finalising the proposal design. The Submissions Report would be made available to the public on the proposal webpage on the Transport for NSW website.

Environmental impacts

Detailed technical investigations have been carried out to assess, manage and minimise the proposal's potential environmental impacts.

The proposal's key impacts to the environment and surrounding community are outlined below. The safeguards and management measures identified in this REF would help minimise potential adverse impacts.

Traffic and transport

During construction there would be travel delays, due to lane closures and construction traffic, that would affect commuter, bus and heavy vehicle traffic. There would also be temporary changes to pedestrian and cycling routes, bus stop locations and property access for residents and businesses. To mitigate impacts to traffic, businesses and residents, construction is proposed to be undertaken in stages in two separate construction zones with night works as required. Transport for NSW would consult with affected people along the corridor about maintaining property access before the start of construction.

The proposal would improve comfort, safety, access and connectivity for pedestrians and cyclists along King Street, Princes Highway and Sydney Park Road through the widening of footpaths, improved landscaping and the provision of formal crossing facilities, shared pathways and a two-way on-road segregated cycleway on Sydney Park Road.

Traffic modelling indicates that the reduction in lane capacity would result in increased delays at intersections along Princes Highway/King Street and Sydney Park Road. However this is offset with the reorganisation of traffic north and southbound to Euston Road and Campbell Street/Campbell Road due to traffic reduction measures including reduction of speed limits and signalling adjustments, as well as the projected increased use of active and public transport and other behavioural changes, are expected to reduce these impacts.

Overall traffic modelling indicates that traffic volumes on Princes Highway, King Street, Sydney Park Road and Mitchell Road during operation of the proposal would significantly reduce from current traffic volumes

The proposal would also result in a number of changes to on-street kerbside parking including:

- Sydney Park Road a loss of 8 car park spaces
- May Street a gain of 9 car park spaces
- King Street between May Street and Goodsell Street a loss of 6 car park spaces
- Princes Highway between Campbell Street and May Street (western side) a loss of 7 car park spaces
- Princes Highway between Campbell Street and May Street (eastern side) a loss of 3 car park spaces

Additional parking spaces will be provided along May Street to mitigate some of the losses detailed above.

Overall, the proposal would significantly improve the movement and place performance of the surrounding built environment, in accordance with the *Practitioner's Guide to Movement and Place* (DPIE, 2020).

Noise and vibration

Construction would result in noise and vibration impacts at nearby sensitive receiver locations, such as at residences and businesses. The majority of residents are located in apartment blocks and multi storey dwellings.

Where possible the proposal would be constructed during standard construction hours. Some activities such as utility relocation works and works within the road median would be required to be carried out outside of standard construction hours due to safety and traffic disruption reasons. Consultation would be carried out with the potentially affected receivers and safeguards and management measures would be implemented in accordance with Transport for NSW *Construction Noise and Vibration Guidelines* (Roads and Maritime, 2016). Vibration impacts would be minimised with safeguards and management measures specified in this REF. Building condition surveys would also be completed before and after the works where there is the potential for buildings to be affected by cosmetic damage.

Noise and vibration management measures to reduce noise and vibration impacts include providing respite periods for high noise generating activities, selection of low noise emitting plant where appropriate and implementation of a monitoring program to assess performance against relevant noise and vibration criteria.

Once operational, the proposal would result in a decrease in traffic noise levels along Princes Highway/King Street and Sydney Park Road and a negligible increase in traffic noise levels along Euston Road and Campbell Street/Campbell Road.

Non-Aboriginal heritage

A Statement of Heritage Impact (SoHI) was completed for the proposal. The SoHI found that there are four heritage listed items (one State and three local) and three unlisted areas of archaeological potential within the proposal area. There are a further five listed heritage items directly adjacent to the proposal area.

The key potential impacts would be:

- Minor direct/indirect impacts to 'St Peters Railway Station Group', listed on the State Heritage Register, State Rail Authority S170 Register and the Marrickville LEP from landscaping works adjacent to the station

- Minor direct/indirect impacts to 'Electricity Substation No. 549', listed on the Ausgrid S170 Register and under the Marrickville LEP from the use of construction machinery and vehicles within proximity to the heritage item
- Minor direct/indirect impacts to, 'Goodsell Estate Heritage Conservation Area', 'Former Brickworks Group', 'St Peters Hotel', 'King Street and Enmore Road Heritage Conservation Area', 'Former St Peters Theatre Façade' and the 'King Street Heritage Conservation Area' listed under the Sydney LEP and Marrickville LEP the use of construction machinery and vehicles within proximity to heritage items
- Moderate direct impacts to the former tramways area of archaeological potential along Princes Highway, King Street and Sydney Park Road and the areas of archaeological potential associated with the 'Former Brickworks Group' (beneath the footpath and the adjacent roadway on King Street and Sydney Park Road) from the use of construction machinery and vehicles within proximity to the heritage item.

Transport for NSW would apply for a Section 57 Exemption from the Heritage Council of NSW prior to construction, for temporary construction activities within the curtilage of the State heritage listed 'St Peters Railway Station Group'. A Section 140 Excavation Permit would also be obtained from the NSW Heritage Division for subsurface disturbances or excavations within the footpath area of archaeological potential associated with the 'Former Brickworks Group'.

Archaeological monitoring would be undertaken by an appropriately qualified historical archaeologist during ground disturbance works within areas of archaeological potential where there is a high likelihood of archaeological remains to be found.

If any item or material is uncovered during construction of the proposal that has potential heritage value or significance, Transport for NSW would follow an established unexpected finds procedure.

Aboriginal heritage

An assessment of impacts to Aboriginal heritage was undertaken in accordance with Stage 1 of Transport for NSW *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI).

The proposal would not impact previously recorded items under the Aboriginal Heritage Information Management system (AHIMS). The proposal would impact areas that have been assessed as of very low to low Aboriginal archaeological sensitivity and therefore impacts to Aboriginal objects are considered unlikely.

Contaminated land

A Stage 1 Contamination Assessment was undertaken for the proposal (inclusive of limited sampling along the project alignment as part of the geotechnical investigations). A number of areas with a moderate to high contamination risk were identified that have the potential to impact upon construction and operation of the site.

A Contaminated Land Management Plan would be developed for areas that have been identified as having moderate or high contamination impact potential including appropriate site-specific responses or controls to manage potential impacts.

Flooding and hydrology

A flooding and hydrology assessment was carried out for proposal including a review of ancillary compounds. Flood impacts resulting from the proposal are predicted to be negligible.

Biodiversity

The proposal is located in a highly urbanised and industrialised locality that has been comprehensively cleared of native vegetation and replaced with exotic and planted vegetation. Impacts to vegetation are limited to the removal of three mature planted native trees and the relocation of seven immature planted trees. The proposal would not be likely to significantly impact threatened species, populations or ecological communities or their habitats.

Landscape character and visual amenity

Visual and landscape impacts would occur during the proposal's construction and operation. During construction, there would be temporary impacts on visual amenity due to the presence of plant, equipment, temporary facilities and stockpiles.

The proposal would significantly improve urban amenity by visually narrowing the road corridor, widening pedestrian pathways and improving landscaping. A large number of new street trees (over 50) would be planted in accordance with the City of Sydney's Street Tree Masterplan and the Marrickville Street Tree Masterplan.

Social and economic factors

The proposal would have both wider regional and local benefits through improved road safety for all road users and improved access and connectivity for pedestrians and cyclists. New street trees and landscaping enhancements provided by the proposal would contribute positively to community values relating to landscape, visual and urban amenity with the study area. This would contribute to the attractiveness of the business environment and commercial properties near the proposal and support opportunities to revitalise the business environment of this area. Improved connectivity to Sydney Park would enhance access to formal and informal recreation facilities and open space for residents and workers of surrounding suburbs. Safer and easier access for pedestrians and cyclists would encourage walking and cycling that would contribute positively to general levels of physical activity and community health outcomes for local and regional communities.

During construction, the community and businesses in the area would likely experience temporary traffic delays, noise, air quality and visual amenity impacts. In addition, it is expected that construction would have an impact on community values, particularly recreational facilities and open spaces in Sydney Park and restaurants/cafés that have outdoor dining or open customer areas, such as cafes and restaurants at Princes Highway and Mitchell Road.

A community and stakeholder engagement plan will be developed which will include management measures such as maintaining pedestrian access and implementing respite periods for works occurring in close proximity to businesses.

Relocation and adjustment of utility services including power, water, sewerage, gas and telecommunications networks would occur as part of the proposal. Minor disruptions to these utility services may occur. Property owners likely to be impacted by any disruptions and access restrictions would be notified before work starts.

Once operational, the reduction in on-street parking along Princes Highway may reduce the convenience of businesses in this location for customers travelling by car, however additional shared pathways and enhanced landscaping may attract more customers travelling by foot or bicycle.

Cumulative impacts

A number of medium to large scale developments are currently being constructed or planned near the proposal. There is the potential for temporary cumulative impacts, including noise and vibration, traffic and transport, air quality and visual amenity impacts, during construction should construction works and activities overlap in terms of timing and/or location.

The Communication and Stakeholder Engagement Plan will include consultation with proponents of nearby projects to increase awareness of construction timeframes and coordinate impact mitigation and management measures such as where possible avoiding long-term overlapping of out of hours work.

During operation, the proposal and adjoining road upgrades would have a positive cumulative impact on road safety and traffic flows within the area, by supporting nearby transport projects such as the M8 Motorway (Stage 1), M4-M5 Link, Sydney Gateway and the Alexandria to Moore Park project.

Over the long term, the proposal and other developments being planned are expected to deliver social and economic benefits to the region through improvements in active transport connections, traffic flows, road safety, urban amenity and employment and business opportunities.

Justification and conclusion

The proposal is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined, and taken into account to the fullest extent possible, all environmental matters affecting or likely to be affected by the proposal.

The proposal's environmental impacts are not considered significant and an Environmental Impact Statement is not required. Therefore, approval is not required from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. The proposal is unlikely to significantly affect threatened species, populations or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act 2016* (BC Act) or *Fisheries Management Act 1994* and a Species Impact Statement or entry into the Biodiversity Offset Scheme is not required is not required. The proposal is unlikely to affect Commonwealth land or have a significant impact on any matters of national environmental significance.

The proposal would enhance pedestrian and cyclist access and safety, as well as liveability and amenity in the area, and thereby meet the objectives of various state, regional and local strategic plans such as the *Future Transport Strategy 2056*, *Greater Sydney Regional Plan* and City of Sydney's *City Plan 2036*.

On balance, the proposal's long-term benefits outweigh its impacts, and the proposal is considered to be justified.

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1. Introduction

1.1 Proposal identification

Transport for NSW proposes to improve the southern 'gateway' to King Street, Newtown by reducing the capacity of King Street, Princes Highway and Sydney Park Road, improving pedestrian and cyclist access and urban amenity along these road corridors to Sydney Park, St Peters Station and surrounding neighbourhoods (the proposal).

The proposal objectives align with the strategic objectives articulated in the *Greater Sydney Region Plan* (Greater Sydney Commission, 2018), the *Road Safety Plan 2021* (Transport for NSW, 2018) and the *Future Transport Strategy 2056* (Transport for NSW, 2018). The strategic context of this proposal is discussed further in Section 2.1.

The proposal is located about four kilometres south west of the Sydney Central Business District (CBD), in the suburbs of St Peters, Newtown, Erskineville and Alexandria along the boundary between the Inner West and Sydney Local Government Areas (LGAs). The location of the proposal is shown in Figure 1-1 and an overview of the proposal is provided in Figure 1-2.

Key features of the proposal would include:

- Reducing the Princes Highway/King Street carriageway from six lanes (generally) to four lanes(two lanes off-peak) from Campbell Street to Sydney Park Road, to accommodate a two way on-road segregated cycleway (on the western side of King Street between May Street and St Peters square), additional landscaping and community spaces to increase urban amenities
- Reducing the Sydney Park Road carriageway from four lanes to two lanes to accommodate a permanent solution for the existing temporary two-way on-road segregated cycleway (northern side), parking and additional landscaping to increase urban amenities,
- New mid-block pedestrian shared crossings to improve access across the Princes Highway/King Street and into Sydney Park, including:
    - A new mid-block pedestrian crossing on Princes Highway north of Short Street.
    - A new mid-block pedestrian and cyclist crossing on Princes Highway between May Street and Goodsell Street.
- Traffic signal and intersection reconfiguration works to improve safety, including:
    - Princes Highway/King Street and Sydney Park Road intersection:
        - King Street southbound approach: Reduce existing three though lanes and one left turn slip lane to a one through lane and one through/left turn lane
        - King Street northbound approach: Maintain existing two through lanes and reduce existing two dedicated right turn lanes to one lane
        - Sydney Park Road approach: Reduce existing two left turn lanes and two right turn lanes to one left turn lane and one right turn lane
        - Replacing existing signalised pedestrian crossing facilities with signalised shared crossing facilities on all approaches
    - Princes Highway/King Street and Goodsell Street intersection:
        - New raised zebra crossing to prioritise pedestrians at the entrance of Goodsell Street
    - Princes Highway/King Street and May Street intersection:
        - Removing traffic signals and re-configuring May Street to left in and left out only movements with a new raised zebra crossing to prioritise pedestrians at the entrance of May Street

    - Princes Highway/King Street and Barwon Park Road intersection:
        - Installing new traffic signals with new pedestrian crossings
    - Sydney Park Road and Mitchell Road intersection:
        - Eastbound approach: Reduce existing two though lanes and one left turn lane to one through lane and a through/left turn lane
        - Westbound approach: Reduce existing one right turn lane, one through lane and one through/left turn lane to one through/right turn lane and one through/left turn lane
        - Mitchell Road approach: Change existing one right turn lane and one right/through/left turn lane to one bus dedicated right turn lane and one through/left turn lane
- Reducing the posted speed limit on Princes Highway from 60 kilometres per hour to 40 kilometres from Campbell Street to Goodsell Street
- Sydney Park carpark access on Kings St will be modified so that Barwon Park Road access will be entry only into the carpark, and King Street will be exit only from the carpark
- Adjustments and relocation of parking spaces along the road corridor
- Road re-surfacing at signalised intersections and along road corridor where required
- Providing dynamic community spaces on both sides of Princes Highway
- Providing landscaped buildouts on Sydney Park Road and Princes Highway
- Relocating the bus stops on Princes Highway near the Short Street intersection, and on Sydney Park Road near the Mitchell Road intersection
- Relocating utilities and adjustments to streetlights where required
- Removing the Princes Highway and Sydney Park Road corridors from the approved B-double freight access network
- Adjusting stormwater to accommodate designed works
- Relocating existing VMS and CCTV camera
- Relocating road signs and line marking works
- Temporary construction facilities, including site compounds and an ancillary facility at Burrows Road and Venice Street, Mascot.

An overview of the proposal is provided in Figure 1-2 and detailed layout plans are included in Appendix C. The proposal is also described in further detail in Section 3.

Sydney Park Junction is located at the intersection of two major road conduits (King Street and Sydney Park Road), a significant cultural precinct, public transport infrastructure hub and one of the city's major green open spaces, Sydney Park.

High traffic and freight volumes on Princes Highway, the southern end of King Street and Sydney Park Road, combined with limited pedestrian crossing opportunities or cycling access, are presently creating an unsafe environment for all road users. The proposal is required to improve road safety and pedestrian and cyclist access along the King Street, Princes Highway and Sydney Park Road corridors. The proposal would also link the urban environment, Sydney Park, transport and pedestrian and cycling movements in a continuously integrated urban landscape that benefits local communities and visitors.

The proposal as shown in Figure 1-2 would be constructed in stages in two separate construction zones along Sydney Park Road and King Street/Princes Highway. This approach would minimise traffic impacts on road users, residents and businesses. Construction is expected to commence in late 2021 and would take around 24 months to complete. Further details of construction staging are provided in Section 3.3.1.

The following definitions have been used in this report:

- The ‘proposal area’ refers to the area that would be directly impacted by the proposal and includes the land within a 10 metre buffer on either side of the road corridor in which construction activities would occur (refer to Figure 1-2) The proposal area encompasses the Princes Highway/King Street from Campbell Street to Lord Street (including the entrances to Barwon Park Road, May Street, Goodsell Street, Lord Street and Concord Street) and Sydney Park Road from Euston Road to King Street (including up to Sydney Park Village entrance, to adjoin Mitchell St works completed by CoS)
- The ‘study area’ encompasses the proposal area and the area that may be indirectly impacted by the proposal and varies for specialist studies
- ‘The locality’ encompasses the area in a 10 kilometre radius of the proposal.

Figure 1-1 The locality

Figure 1-2 The proposal

Figure 1-2 The proposal

Figure 1-2 The proposal

Figure 1-2 The proposal

1.2 Purpose of the report

This review of environmental factors (REF) has been prepared by Jacobs on behalf of Transport for NSW Eastern Sydney Project Office.

For the purposes of these works, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (EP&A Act).*

The purpose of the REF is to describe the proposal, to document the likely impacts of the proposal on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in the context of clause 228 of the Environmental Planning and Assessment Regulation 2000, the factors in *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979 (Is an EIS required? guidelines)* (DUAP, 1995/1996), *Roads and Related Facilities EIS Guideline* (DUAP 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the *Australian Government's Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the REF helps to fulfil the requirements of Section 5.5 of the EP&A Act including that Transport for NSW examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- The potential for the proposal to significantly impact any other matters of national environmental significance or the environment of Commonwealth land and the need, subject to the EPBC Act strategic assessment approval, to make a referral to the Australian Government Department of the Environment and Energy for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

2.1 Strategic need for the proposal

2.1.1 Consistency with relevant strategies and plans

The consistency of the proposal with relevant strategies and plans is summarised below.

Directions for a Greater Sydney 2017-2056

Directions for a Greater Sydney 2017-2056 (Directions for a Greater Sydney) (GSC, 2017) outlines a set of common guiding principles that will help navigate the future of Greater Sydney. It aims to better integrate land use and infrastructure to deliver a more productive, liveable and sustainable Greater Sydney to 2056.

Directions for a Greater Sydney identifies ten directions, including:

- A city supported by infrastructure
- A city for people
- Housing the city
- A city of great places
- Jobs and skills for the city
- A well-connected city
- A city in its landscape
- An efficient city
- A resilient city
- A collaborative city.

Strategies for progress towards these ten directions are highlighted in the *State Infrastructure Strategy 2018-2038* (Infrastructure NSW, 2018) and *Future Transport Strategy 2056* (Transport for NSW, 2018a) and methods for implementation are detailed in the District Plans along with relevant local environmental plans, agency programs and transport programs.

The proposal would support the direction for a well-connected city by improving pedestrian pathways and cycleways to create a more accessible and walkable city. The proposal would also support the direction for “a city in its landscape" by improving access and connection to a public open space (Sydney Park).

Greater Sydney Region Plan – A Metropolis of Three Cities

The *Greater Sydney Region Plan – A Metropolis of Three Cities* (the Greater Sydney Regional Plan) (GSC, 2018a) aims to rebalance growth and deliver its benefits more equally and equitably to residents across Greater Sydney. The Greater Sydney Region Plan has been prepared concurrently with *Future Transport 2056* and the *State Infrastructure Strategy 2018-2038*, to align land use, transport and infrastructure planning to reshape Greater Sydney as three unique but connected cities.

A key vision of the Greater Sydney Regional Plan is to create walkable cities where most people can travel to their nearest metropolitan centre or cluster by public transport within 30 minutes; and where everyone can travel to their nearest strategic centre by public transport, seven days a week, to access jobs, shops and services.

The Eastern City District Plan (GSC, 2018b) is the district level guide for implementing the Greater Sydney Region Plan. The Eastern City District is at the centre of the Eastern Harbour City that has the Harbour CBD, Australia’s global gateway and financial capital, as its metropolitan centre.

The Eastern City District Plan recommends prioritisation of direct, safe and accessible pedestrian and cycling routes to local destinations and services, within a 10-minute walk of centres.

The proposal would support Planning Priorities E3 and E10 of the Eastern City District Plan as it would provide direct, safe and accessible walking and cycling connections that can be used by people of all ages and abilities between the major shopping and cultural precinct along King Street, St Peters Station, Sydney Park and surrounding neighbourhoods. The proposal would also deliver connections to the Sydney Green Grid (Planning Priority E17) by improving walking and cycling access to Sydney Park across Princes Highway/King Street and Sydney Park Road. The proposal is also consistent with Planning Priority E6 as it would improve liveability and place value while conserving heritage values within the local area.

State Infrastructure Strategy 2018-2038 – Building Momentum

The *State Infrastructure Strategy 2018-2038* (the State Infrastructure Strategy) (Infrastructure NSW, 2018) sets the strategic vision for infrastructure in Greater Sydney over the next 18 years and combined with the *Future Transport Strategy 2056*, the Greater Sydney Region Plan and the *Regional Development Framework* (NSW Government, 2018), brings together infrastructure investment and land-use planning for cities and regions within NSW.

The State Infrastructure Strategy outlines Infrastructure NSW's recommendations for priority transport infrastructure projects and initiatives for Sydney and NSW to 2038, to ensure the transport system creates opportunities for people and businesses to access the services and support they need.

The proposal would support key recommendations made for the transport sector as it would develop active transport links to support the mass transit system while enhancing liveability, accessibility and local amenity and improving road safety in the area. The proposal would also support specific Recommendations 50 and 51 made for Greater Sydney as it would re-allocate road space in a key commuter corridor to give priority to more productive and sustainable transport modes.

Future Transport Strategy 2056

The Future Transport Strategy 2056 (the Future Transport Strategy) (Transport for NSW, 2018a) underpins and supports the State Infrastructure Strategy and sets the 40-year vision, strategic directions and outcomes for customer mobility in NSW. It will be delivered through a series of supporting plans, including the *Tourism and Transport Plan*, the *Greater Sydney Services and Infrastructure Plan* and the *Road Safety Plan.*

The Strategy is based on the Movement and Place framework, which aims to allocate road space in a way that improves the liveability of places. The guiding principles within the framework acknowledge that the needs and expectations of transport customers and communities change for different street environments. The Movement and Place Framework also guides specific corridor and place plans to be developed as supporting plans of the Future Transport Strategy.

The Strategy outlines six state-wide outcomes for the future of the mobility in the state, which together aim to positively impact the economy, communities and environment of NSW. These outcomes provide a framework for planning and investment aimed at harnessing rapid change and innovation to support a modern, innovative transport network.

The proposal would support Outcomes 2, 4 and 6 by improving the liveability and amenity of the Sydney Park Junction area, providing the infrastructure that allow and encourage sustainable and affordable modes of transport (walking and cycling) and increasing safety for road users.

The Greater Sydney customer outcomes section of the Future Transport Strategy is summarised in the *Greater Sydney Services and Infrastructure Plan*.

The proposal would also be consistent with initiatives planned for Greater Sydney over the short term (within 10 years) by improving cycling infrastructure near Green Square, a strategic centre on the Principal Bicycle Network. The Bicycle Network would allow customers to travel between centres across Greater Sydney and would form part of Greater Sydney's Green Grid (discussed below).

Greater Sydney Services & Infrastructure Plan

The *Greater Sydney Services and Infrastructure Plan* (Transport for NSW, 2018b) builds on the state-wide transport outcomes identified in the Future Transport Strategy and outlines the economic, social and environmental benefits which customers can expect from the transport system in Greater Sydney. The Plan establishes specific customer outcomes for the movement of people and freight in Greater Sydney and identifies the policy, service and infrastructure initiatives to achieve these.

The proposal would assist in achieving Customer Outcome 3 by providing safe and comfortable pedestrian and cycling pathways suitable for use by people of all ages and abilities as well as providing direct connections between Princes Highway, King Street and Sydney Park Road and local destinations such as Sydney Park, St Peters Station and the King Street commercial precinct. The proposal would also assist in achieving Customer Outcome 4 by including a number of amenity improvements that will improve the liveability of places along the King Street/Princes Highway and Sydney Park Road corridors.

NSW Premier's Priorities

The NSW Government has identified 14 Premier's priorities (NSW Government, 2019) for the state to grow the economy, deliver well connected communities with quality local environments, provide high quality education and break the cycle of disadvantage.

Premier Priority 11 aims to increase the proportion of homes in urban areas within 10 minutes' walk of quality green, open and public space by 10 per cent by 2023. The proposal would address this priority by improving the walkability, connectivity and accessibility of public spaces along King Street, Princes Highway and Sydney Park Road which will promote healthier lifestyles and bring people from surrounding residential neighbourhoods together.

Greater Sydney Green Grid

The *Greater Sydney Green Grid* (Government Architect NSW, 2017a) is the NSW Government's long-term vision for a network of high quality green spaces in Metropolitan Sydney that connect communities to the natural landscape. It promotes the creation and consolidation of a network of high-quality green areas, such as regional parks, local parks, bushland corridors, waterways and tree-lined streets that connect town centres, public transport networks, public places and major residential areas. Linkages between open spaces are fostered within the wider public realm through enhancing creek corridors, transport routes, suburban streets, footpaths and cycle ways. In this way, the grid provides hydrological, ecological and recreational services to the growing city and promotes sustainable development.

The *Greater Sydney Green Grid* is an integral part of the Greater Sydney Region Plan and District Plans and underpins *Greener Places*, the draft green infrastructure policy. It provides preliminary prioritisation of Green Grid opportunities in terms of their strategic potential to catalyse a new interconnected high performance green infrastructure network which will support healthy urban growth.

One of the key project opportunities identified in the Central District is to connect Green Square with Moore Park, Centennial Parklands and Sydney Park (Project Opportunity CD.1.2). Connections and access to these major regional open spaces will be essential to support the recreational needs and enhance the liveability within the Central District. The proposal would support this project opportunity by improving cycling connections between Green Square and Sydney Park and improving green infrastructure within the proposal area.

Greener Places

The draft *Greener Places* policy (Government Architect NSW, 2017b) has been produced to guide the design, planning and delivery of green infrastructure across NSW. The draft policy defines green infrastructure as the network of green spaces, natural systems and semi-natural systems including parks, rivers, bushland and private gardens that are strategically planned, designed, and managed to support good quality of life in the urban environment.

The aim of the policy is to create healthier and more liveable cities and towns by improving community access to recreation and exercise, supporting walking and cycling connections, and improving the resilience of our urban areas.

The proposal would support this policy by reducing road capacity of King Street, Princes Highway and Sydney Park Road and improving pedestrian and cycling pathways along these roads to encourage walking and cycling.

NSW Road Safety Strategy

The *NSW Road Safety Strategy 2012-2021* (Transport for NSW, 2011) sets the direction of road safety in NSW. NSW is committed to at least a 30 per cent reduction in fatalities and serious injuries between 2012 and 2021.

This proposal would assist in meeting this goal by improving road safety along King Street, Princes Highway and Sydney Park Road and intersections within the proposal area through improved intersection design, improved pedestrian and cyclist pathways and crossings, and lowering the speed limit on King Street/Princes Highway and Sydney Park Road.

Road Safety Plan 2021

The *Road Safety Plan 2021* (Road Safety Plan) (Transport for NSW, 2018c) details the NSW Government's commitment to improving safety on NSW roads. It outlines the State Priority Target to reduce fatalities by 30 per cent by 2021 (compared to average annual fatalities over 2008–2010) and aligns with the Towards Zero vision of the Future Transport Strategy, which aims to have zero fatalities and serious injuries on NSW roads by 2056.

The Road Safety Plan sets out four priority areas for action. The proposal is consistent with the priority to create liveable and safe urban communities as it would reduce the risk for crashes, fatalities and serious injury through improved intersection design, improved pedestrian and cycling pathways and crossings and lowering the speed limit on King Street/Princes Highway and Sydney Park Road.

Australia Infrastructure Audit

The Australian Infrastructure Audit (Infrastructure Australia, 2019) is a strategic audit of Australia's transport, energy, water, telecommunications and social infrastructure and identifies the major challenges and opportunities facing each sector over the next 15 years and beyond.

Challenge 42 of the audit recognises that Australia has relatively low rates of active transport, driven by a range of issues including insufficient infrastructure and safety concerns. Without action, Australia's transport networks and travel patterns will remain poorly integrated and sustainability improvements will be limited. Challenge 66 highlights the fact that pedestrian and cyclist fatalities are over represented in road fatalities and injuries, which impacts on the attractiveness of active transport. The proposal would address these challenges by improving safety, access and connections for pedestrians and cyclists along King Street, Princes Highway and Sydney Park Road to encourage the uptake of active modes of transport.

Challenge 62 recognises that road safety performance in Australia is not on track to meet the objectives of the National Road Safety Strategy. If no action is taken in this regard, road users will continue to be vulnerable and at risk of serious injury or fatality. The proposal would address this challenge by improving intersection performance and safety within the Camperdown, Newtown and Erskineville Road Corridor and the St Peters to Moore Park Road Corridor.

Sustainable Sydney 2030 – Community Strategic Plan 2017-2021

Sustainable Sydney 2030 – Community Strategic Plan 2017-2021 (City of Sydney Council, 2016) is the City of Sydney Council's community strategic plan that sets a vision for the sustainable development of a green, global and connected city to 2030 and beyond. It outlines 10 strategic directions to achieve this vision, as well as 10 targets against which to measure progress.

The 10 strategic directions to guide the future of the city are:

1. A globally competitive and innovative city
2. A leading environmental performer
3. Integrated transport for a connected city
4. A city for walking and cycling
5. A lively and engaging city centre
6. Resilient and inclusive local communities
7. A cultural and creative city
8. Housing for a diverse population
9. Sustainable development, renewal and design
10. Implementation through effective governance and partnerships.

Target 7 of *Sustainable Sydney 2030* specifies that at least 10 per cent of total trips made in the city should be made by bicycle and 50 per cent made by pedestrian movement. The proposal supports this target, as well as Strategic Directions 3 and 4, by creating accessible, safe and connected pedestrian and cycling paths along King Street, Princes Highway and Sydney Park, to encourage walking and cycling as the preferred options for short journeys.

Liveable Green Network

The *Liveable Green Network* (City of Sydney, 2011) is a strategy developed by City of Sydney Council to make the City of Sydney local government area (LGA) as green, global and connected as possible. It aims to create a pedestrian and cycling network across the LGA that connects people with the City of Sydney, village centres and neighbourhoods, as well as major transport and entertainment hubs, cultural precincts, parks and open spaces. The *Liveable Green Network* is a key project idea in *Sustainable Sydney 2030* and will contribute to the delivery of Targets 7, 8, and 9 of the strategy.

The section of Sydney Park Road between Mitchell Road and King Street forms part of the planned city wide cycle priority and the primary local pedestrian network in the *Liveable Green Network.* The Liveable Green Network Strategy and Master Plan report also identifies the Princes Highway/King Street as a key pedestrian and cycle route between King Street Village Centre, Sydney Park and surrounding residential areas.

The proposal would support the development of the *Liveable Green Network* by providing separated on-road cycleways along Sydney Park Road and King Street (between St Peters square and May Street), improving pedestrian access and safety along King Street, Princes Highway and Sydney Park Road and providing landscape treatments along these roads to enhance amenity.

Walking Strategy and Action Plan 2015-2030

The *Walking Strategy and Action Plan 2015-2030* (Walking Strategy and Action Plan*)* (City of Sydney Council, 2014) is the City of Sydney Council's strategy to deliver a more walkable and liveable city and a more effective transport network. The strategy sets targets, directions and actions to encourage walking in the City of Sydney and meeting the *Sustainable Sydney 2030* targets.

The fourth and fifth targets of the Walking Strategy and Action Plan is to increase footpath capacity by 20% and to improve walking amenity by 10% on main activity streets through planned upgrades.

The four directions of the strategy are:

- Make walking quick, convenient and easy
- Make walking inviting and interesting
- Make walking safe and comfortable
- Create a strong walking culture.

Action O2 involves the design of walking-related infrastructure that is accessible and inclusive for everyone. Action O4 involves designing activity streets and major street upgrades as low speed environments and using traffic calming measures such as lower speed limits.

The proposal is consistent with the directions of the Walking Strategy and Action Plan and would deliver on the actions and targets set by the strategy by improving pedestrian infrastructure and urban amenity, and therefore pedestrian safety and the walking environment of the proposal area.

Cycling Strategy and Action Plan 2018-2030

The *Cycling Strategy and Action Plan 2018-2030* (Cycling Strategy and Action Plan*)* (City of Sydney Council, 2017) is the City of Sydney Council's strategy to make bicycle transport easier and safer so that it would be a more attractive and feasible option for more people. The strategy sets targets, priorities and actions for increasing bike trips in the City of Sydney and meeting the *Sustainable Sydney 2030* targets.

The first priority of the Cycling Strategy and Action Plan is to create a safe bike network to connect people and destinations. The bike network consists of a network of local and regional routes that underpins the City's transport and environmental goals. The regional routes are the main corridors, which bring larger flows of people into the city from across the inner Sydney area, whereas the local routes are the connections, bringing people closer to the doors of homes and businesses.

The section of Sydney Park Road between Mitchell Road and King Street forms part of the planned Regional Bike Network that would connect St Peters to the city. The proposal would support the Cycling Strategy and Action Plan by providing a new on-road segregated cycleway along a planned route of the Regional Bike Network.

Connecting our City

Connecting our City (City of Sydney Council, 2012) is City is a 25-year integrated transport and land use strategy endorsed by Sydney City Council to create a sustainable city and accommodate the high growth in residents, workers and visitors to the local area in the future. The strategy is a supporting document to the *Environmental Action 2016 – 2021 Strategy and Action Plan* that was endorsed by the City of Sydney in March 2017. *Connecting our City* recognises that public transport services and major roads in the Sydney Metropolitan Area are already running close to capacity, and at peak times, exceeding capacity thresholds.

One of the six key action areas proposed in the strategy is to encourage active transport. The proposal is consistent with key actions proposed for this action area by enhancing pedestrian access, improving pedestrian safety and priority (through wider footpaths and traffic light timings), providing a separated cycleway as part of the Regional Bike Network and improving pedestrian and cycle pathways along Sydney Park Road and King Street as part of the Liveable Green Network.

Another key action area is to manage streets and traffic to act as places. The proposal is consistent with key actions proposed for this action area by giving pedestrians higher priority along King Street, Princes Highway and Sydney Park Road.

City Plan 2036

City Plan 2036 (City of Sydney Council, 2019) is the draft local strategic planning statement released by the City of Sydney Council and sets out a 20-year land use planning vision for the LGA. The draft planning statement links state and local strategic plans with the City's planning controls to guide development. It delivers on the 10 strategic directions of the community strategic plan, *Sustainable Sydney 2030*, and has been informed by the City's other social, environmental, economic and cultural plans and strategies.

The draft planning statement sets 13 priorities and a series of actions to achieve the vision and guide future changes to the City's planning controls.

Planning priorities 1 and 5 of the *City Plan 2036* prioritises the creation of liveable and walkable neighbourhoods, a connected city, and accessible local centres that promote active healthy lifestyles and social interaction. The proposal would deliver on these planning priorities by reallocating road space to create wider footpaths (and shared zones), giving pedestrians and cyclists priority at crossings, lowering the speed limit on King Street/Princes Highway and Sydney Park Road and improving urban amenity along King Street, Princes Highway and Sydney Park Road through landscaping and the provision of dynamic community spaces.

Ashmore Precinct

The Ashmore Precinct (City of Sydney Council, 2013a) is located in Erskineville and is bounded by Ashmore Street, Mitchell Road, Coulson Street and the Illawarra railway line, as shown in Figure 2-1. It is the largest industrial estate identified for urban renewal outside Green Square and will deliver new homes, a new road network, public open space and pedestrian and cycle links when completed.

The planned Kooka Walk in the Ashmore Precinct will provide a green walking and cycling link between Harry Noble Park in the north and Sydney Park in the south. The proposal would improve access and connection for pedestrians and cyclists from the Ashmore Precinct to St Peters and Newtown by improving pedestrian and cycling pathways from the southern end of the Kooka Walk to St Peters Station and Sydney Park.

Our Inner West 2036

Our Inner West 2036 (Inner West Council, 2018) is the Community Strategic Plan of Inner West Council which identifies the community's vision, goals and strategies for the future.

Strategic Direction 2 aims to create unique, liveable and networked neighbourhoods. The proposal would support Outcome 2.6, by allowing people to walk, cycle and move around the Inner West with ease, by delivering integrated infrastructure for transport and active travel, and by ensuring transport infrastructure is safe and connected.

St Peters Triangle Masterplan

The St Peters Triangle Precinct is located on the eastern edge of the Marrickville Local Government between King Street, Princes Highway, Campbell Street and the Illawarra railway line, as shown in Figure 2-1. The St Peters Triangle Master Plan (Inner West Council, 2011) aims to enhance the existing social character and physical structure of the St Peters Triangle precinct by providing a framework for development and associated public domain improvements.

The proposal is consistent with the desired future character of the precinct as outlined in the Masterplan, by improving urban amenity along the Prince Highway and improving pedestrian access and connection between St Peters Station, Sydney Park and the precinct.

Sydney Park Plan of Management and Detailed Master Plan

The *Sydney Park Plan of Management* (Sydney Park POM) (City of Sydney Council, 2014) seeks to protect the cultural heritage and ecology of Sydney Park. It provides a clear and transparent management framework that guides the future use, development and maintenance of Sydney Park in line with the *Local Government Act 1993*.

The *Sydney Park Detailed Master Plan* (City of Sydney Council, 2006) provides detailed design strategies for the development of Sydney Park. In particular, it makes recommendations for landscaping along the park perimeter, and future cycling connections to the park.

The Sydney Park POM and Detailed Master Plan has been considered in this REF and in the development of the proposal, particularly in regard to the protection of the Sydney Park Brick Kilns Precinct cultural heritage values and Sydney Park's natural environments, landscaping along the boundary of the park and pedestrian and cycling linkages into the park.

Sydney Park Brick Kilns Precinct Conservation Management Plan

The *Sydney Park Brick Kilns Precinct Conservation Management Plan* (CMP) (Sydney Park CMP) (City of Sydney Council, 2007) sits under the Sydney Park Plan of Management. The aim of the CMP is to identify the cultural significance of the Brick Kilns Precinct, and to provide management guidelines to enable this significance to be retained in future use and development. The conservation policy outlined in the CMP has been considered in this REF and in the design of the proposal.

2.1.2 WestConnex M8 Motorway (Stage 1)

The M8 Motorway (Stage 1) road project, Stage 2 of WestConnex, has been delivered by Transport for NSW on behalf of the NSW Government. The project forms part of the NSW Government's commitment to deliver WestConnex for Sydney in response to the recommendations in the State Infrastructure Strategy, the *NSW Long Term Transport Master Plan* (Transport for NSW, 2012) and the NSW Government's State Priorities announced in September 2015.

The New M8 provides new twin tunnels from the existing M5 East at Kingsgrove to a new interchange at St Peters and improve east-west corridor access between the Sydney CBD, Port Botany and Sydney Airport precincts and the South West growth areas.

Local streets and intersections around the St Peters interchange have also been upgraded to ensure safe and efficient connections for the M8 Motorway (Stage 1). As part of these works, Euston Road and Campbell Road have been widened and the Campbell Street / Princes Highway / Campbell Road and the Euston Road / Sydney Park Road / Huntley Street intersections have been upgraded to accommodate traffic to and from the M8 Motorway (Stage 1). These upgrades provide parallel alternative east-west and north-south corridors to King Street/Princes Highway and Sydney Park Road.

In April 2016, the (former) Department of Planning and Environment approved the M8 Motorway (Stage 1) project subject to a number of conditions of approval (DPE, 2018). Conditions B44 and B50 specify the development of a 'Sydney Park Junction' concept that could be developed as a separate project, requiring a separate environmental assessment to introduce traffic calming initiatives along Princes Highway and improvements in accessibility to Sydney Park for the residential areas of St Peters, Newtown and Erskineville. Condition B50 also requires the provision of upgraded cycle and pedestrian facilities within one kilometre of the boundary of the St Peters Interchange.

Condition 51 specifies the preparation of a detailed Pedestrian and Cycle Implementation Strategy that includes, among other things, details of selected routes and connections to existing local and regional pedestrian and cycling routes and details of associated landscaping works.

The proposal is consistent with approval conditions B44, B50 and B51 of the M8 Motorway (Stage 1) project by providing traffic calming initiatives along King Street/Princes Highway and Sydney Park Road and upgrading pedestrian and bicycle pathways within one kilometre of the St Peters Interchange.

Figure 2-1 Urban development context

2.2 Existing infrastructure

2.2.1 Road network

Figure 2-2 shows the location of the proposal in the context of other significant arterial routes in and around the CBD.

The proposal runs along Princes Highway, King Street and Sydney Park Road and connect with major roads that lead north to the city centre and south to Mascot and the airport. At the eastern extent of the proposal, Sydney Park Road intersects with Euston Road which is a major arterial road leading to Sydney's eastern suburbs. Euston Road has recently been upgraded as part of the WestConnex Stage 2 (St Peters Interchange) works. At the northern end of the proposal, Sydney Park Road intersects with King Street, which is a major arterial road that crosses the railway line (T2 Inner West and Leppington Line) and runs through the commercial trading strip of Newtown to Sydney University in the north. The western extent of the proposal interfaces with the WestConnex Stage 2 (St Peters Interchange) works along Campbell Road and Campbell Street.

For the purposes of this REF the proposal is discussed in two segments:

- Princes Highway/King Street corridor (Western Section)
- Sydney Park Road (Eastern Section).

Western Section – Princes Highway/King Street corridor

Around 665 metres of the Princes Highway/King Street road corridor, east of its intersection with Sydney Park Road, are located within the proposal.

Each of Princes Highway and King Street has two lanes in both directions. On-street parking is permitted on the eastern side of Princes Highway south of Barwon Park Road and along the western side of Princes Highway/King Street between Campbell Street and Goodsell Street. Princes Highway/King Street has a 60 kilometre per hour speed limit and the road is undivided with kerb and guttering.

Pedestrian pathways are present along both sides of Princes Highway/King Street. Signalised intersections allow for pedestrian crossings. No dedicated mid-block crossings are present within the section, and there are no dedicated cycle ways, shared use provisions or cycle road markings.

Barwon Park Road has one lane in each direction and provides alternative access to Campbell Road. Unrestricted parking and pedestrian pathways are available on both sides of the road. There are no dedicated cycleways, shared use provisions or cycle road markings.

May Street has two lanes in both directions between Princes Highway and Applebee Street. From Applebee Street, the second lane in both directions ends and only one lane in each direction is provided. Timed and unrestricted kerbside parking as well as pedestrian pathways are available on both sides of the road. There are no dedicated cycleways, shared use provisions or cycle road markings.

Goodsell Street has one lane in each direction. Timed and unrestricted parking as well as pedestrian pathways are available on both sides of the road. There are no dedicated cycleways, shared use provisions or cycle road markings.

Eastern Section – Sydney Park Road

Sydney Park Road is a major east-west route connecting King Street with Euston Road and has two lanes in each direction. On-street parking is available on both sides of the road. Shared pathways are present along both sides of Sydney Park Road. There are no dedicated cycleways, shared use provisions or cycle road markings. Sydney Park Road has a 60 kilometre per hour speed limit with kerb and guttering.

Sydney Park Road is a three-lane single carriageway west of Mitchell Road and a four-lane single carriageway east of Mitchell Road with a posted speed limit of 40 kilometres per hour, to accommodate the temporary Sydney Park Road pop-up cycleway.

Mitchell Road has two southbound lanes (except where parking provided) and one northbound lane. Parking and pedestrian pathways are available on both sides of the road. There are no dedicated cycleways, shared use provisions or cycle road markings along Mitchell Road.

Photo 2-1 Intersection of Barwon Park Road and Princes Highway facing south, showing roadways, utilities, street sign gantry, and BP petrol station

Photo 2-2 View of Princes Highway from Barwon Park Road facing west, showing roadways, street furniture, large VMS over the highway, and apartment complex

Photo 2-3 Intersection of Campbell Road and Princes Highway facing east, showing roadways, utilities, traffic lights, and industrial buildings

Photo 2-4 View of the King Street railway pedestrian bridge from Concord Street facing south, metal pedestrian bridge on the right and adjacent railway cutting

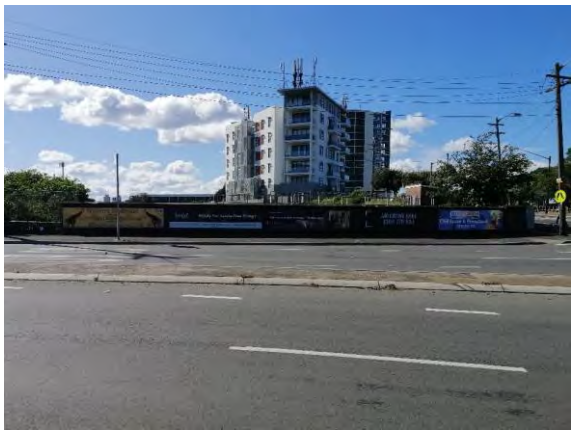

Photo 2-5 View of the King Street rail overbridge facing east, showing road with low wall, and metal pedestrian bridge in the background

Photo 2-6 View of the Sydney Park entrance facing west, showing Sydney Park Road, traffic lights and buildings in the background

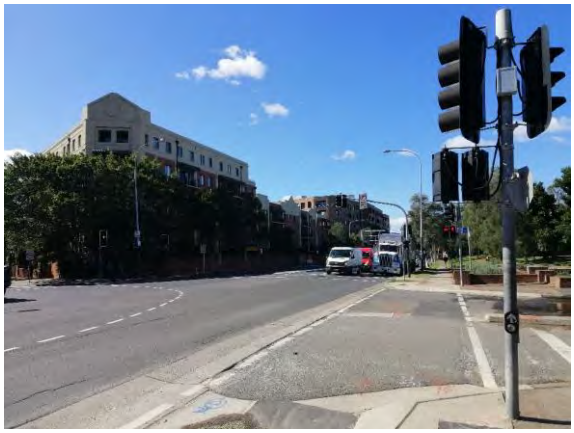

Photo 2-7 View of Sydney Park Road from the intersection of Mitchell Road, showing roadway, traffic lights, street light and adjacent buildings

Photo 2-8 View of the Sydney Park entrance facing west, showing Sydney Park Road, traffic lights and buildings in the background

Figure 2-2 Project and transport context

2.2.2 Parking

Near the proposal, public off-street parking is provided at two car parks at Sydney Park. The car parks near Mitchell Road and May Street provide approximately 100 and 90 car spaces, respectively. Both car parks are restricted to four-hour parking on Monday to Friday and unrestricted on weekends.

On-street kerbside parking on and near King Street, Princes Highway and Sydney Park Road is generally limited. On-street kerbside parking is permitted at the following locations and times:

- Western side of Princes Highway, between Campbell Street and May Street: generally unrestricted kerbside parking outside of weekday morning peak hour clearway restrictions (6.00am to 10.00am). Short section of 30-minute timed parking south of Short Street between 10.00am to 6.00pm on weekdays and unrestricted otherwise
- Western side of King Street, between May Street and Goodsell Street: unrestricted parking outside of weekday morning peak clearway restrictions (6.00am to 10.00am) and 3.30pm to 5.30pm on weekdays
- Eastern side of Princes Highway, between Barwon Park Road and Campbell Street: generally unrestricted kerbside parking outside of weekday evening peak hour clearway restrictions (3.00pm to 7.00pm)
- Northern side of Sydney Park Road, east of Mitchell Road: unrestricted kerbside parking on weekends only. As of July 2020, this parking has been removed temporarily to accommodate the temporary Sydney Park Road pop-up cycleway. Existing no parking zones on the southern side of Sydney Park Road east of Mitchell Street have been temporarily changed to three-hour timed parking between 8:00am to 8:00pm seven days a week
- Both sides of King Street, north of Lord Street: timed and unrestricted parking on both sides of King Street outside of weekday morning (6.00am to 10.00am) and evening (3.00pm to 7.00pm) peak hour clearway and no parking restrictions
- Barwon Park Road: unrestricted kerbside parking on both sides of the road
- May Street: Parking is not permitted eastbound along May Street, west of May Lane, between 6:30am and 6:00pm. Unrestricted parking is available along the westbound lane east of Applebee Street
- Goodsell Street: Unrestricted parking is available on both sides of the road between Mary Lane and King Street and restricted two-hour parking is available on both sides of the road west of Mary Lane
- Mitchell Road: Half hour parking is available along the northbound lane, south of Coulson Street, between 8:30am to 6:00pm on weekdays and between 8:30am to 12:30pm on Saturday. Unrestricted parking and car share parking is available along the southbound lane.

On and off-street parking and kerbside restrictions within the proposal area are shown in Figure 2-3.

Figure 2-3 Existing parking conditions

2.3 Active transport network (pedestrians and cyclists)

Footpaths are provided on both sides of Princes Highway, Sydney Park Road and King Street. Footpaths are generally wide, particularly on King Street, with average footpath widths of over 1.8 metres. On Sydney Park Road, an approximately two-metre verge separates the shared path and road and contributes to a comfortable walking environment.

On Princes Highway and King Street there is no separation between the footpath and road except for the eastern side between Sydney Park Road and Barwon Park Road. This contributes to an uncomfortable walking environment due to the 60 kilometres per hour speed limit and high adjacent vehicle flows. There is also no formal separation between the footpath and road on King Street. However, parking is permitted on sections of Princes Highway and King Street during off-peak periods, which acts as an informal buffer zone between pedestrians and passing vehicles.

Signalised pedestrian crossings are provided at the intersections of King Street / Concord Street / Lord Street, King Street / Sydney Park Road, Princes Highway / May Street, Princes Highway / Campbell Street, Euston Road / Huntley Street / Sydney Park Road and Mitchell Road / Sydney Park Road, however long distances (of up to 525 metres) often separates these crossings. Pedestrian crossings and ramps are also missing on one or multiple legs at some intersections within the proposal area.

The existing cycle network surrounding the proposal is shown in Figure 2-4 and is well-established with provision of off-road shared paths on both sides of Sydney Park Road. However, these shared paths do not meet current off-road shared path minimum width requirements (2.5 metres). The shared paths provide connectivity to the wider regional cycle network for access to the Sydney CBD, Redfern, Green Square, Sydney Airport and the Inner West. The shared paths on Sydney Park Road are currently supplemented by a temporary separated cycleway on the northern side of Sydney Park Road between Mitchell Road and King Street. Off-road shared paths are also provided throughout Sydney Park. In terms of bicycle parking, u-rails are provided at regular intervals on both sides of King Street between Lord Street and Alice Street and service retail / commercial land uses and active frontages within the Newtown town centre. Secure bicycle parking spaces are not provided on Princes Highway, King Street south of the rail overbridge or Sydney Park Road.

High pedestrian and cyclist activity generally occurs at the King Street / Sydney Park Road, Sydney Park Road / Mitchell Road and Princes Highway / May Street intersections and along King Street and Sydney Park Road (west of Mitchell Road), due to people travelling between St Peters Station, the commercial and entertainment corridor along King Street, Sydney Park and surrounding neighbourhoods. Low to moderate levels of pedestrian and cyclist activity occur along Princes Highway south of May Street and Sydney Park Road east of Mitchell Road due to limited active frontages in these areas.

Figure 2-4 Pedestrian and cycle networks near the proposal

2.3.1 Public transport

Rail

St Peters Station is situated at the northern end of the proposal area. The station is serviced by the Sydney Trains T3 Bankstown Line, which run between the Sydney CBD and Liverpool / Lidcombe. Approximately four to eight trains (in each direction) service the station during the morning and evening peak periods.

Bus transport

Four bus routes operate near the proposal, which provide connections to the Sydney CBD, Bondi Junction, Coogee, Marrickville, Wolli Creek, Rockdale, Kogarah and Leichhardt. There are an additional two NightRide bus routes that replace train services in the late evening and early morning between Town Hall and Sutherland / Cronulla. Bus routes are detailed in Table 2-1 and shown in Figure 2-5.

Table 2-1 Bus routes near the proposal

Bus route	Number of services (bi-directional)		
	Total weekday	Total Saturday	Total Sunday
308 – Marrickville Metro to Central Eddy Avenue via Redfern	45	27	17
348 – Wolli Creek to Bondi Junction	74	54	44
370 – Leichhardt Marketplace to Coogee	154	109	97
422 – Kogarah to Central Pitt Street	131	96	64
N10 – Town Hall to Sutherland (NightRide)	17	17	9
N11 – Town Hall to Cronulla (NightRIde)	8	8	8

Within the study area, these routes are serviced by two bus stops on Princes Highway, four bus stops on Sydney Park Road and two bus stops along King Street. Bus stop quality, determined by the provision of facilities for bus passengers, is generally acceptable with all bus stops providing a flag and timetable. Most bus stops provide shelter and tactile markers and approximately half provide seating.

Figure 2-5 Bus routes near the proposal

2.4 Proposal objectives and development criteria

The proposal objectives align with the strategic objectives articulated in the *Greater Sydney Regional Plan*, the *Road Safety Plan 2021* and the *Future Transport Strategy 2056*. The primary objectives of the proposal are to:

- Improve the amenity of the 'gateway' to King Street by enhancing the urban amenity of the area around the entry to St Peters station, and access to Sydney Park along Princes Highway and Sydney Park Road to provide an improved pedestrian environment
- Transform King Street and Sydney Park Road to achieve a better-balanced movement and place outcome
- Improve cyclist movement and safety in the area, particularly to Sydney Park and to St Peters Station, which would align with the Principal Bicycle Network planned for Greater Sydney (outlined in the Future Transport Strategy discussed in Section 2.1.1)
- Improve pedestrian and cycling connectivity to Sydney Park and improve the place environment of King Street, Princes Highway and Sydney Park Road
- Improve road safety for all customers
- Minimise the environmental impact of the development.

2.5 Alternatives and options considered

2.5.1 Methodology for selection of preferred option

The proposal development process involved an iterative method of investigation, identification, evaluation and refinement of road and pedestrian and cyclist pathways improvements within the existing Princes Highway / Sydney Park Road corridor. It included several meetings with key stakeholders, including City of Sydney Council and Inner West Council, which were coordinated by Transport for NSW. The purpose of these meetings was to discuss urban design, safety and traffic considerations and coordinate plans for transport, commercial and residential development.

Options explored to resolve urban design objectives in the context of the character and functioning of the area were based on the road alignment, lane configurations, public space deployment and active transport arrangements and included, in no particular order:

- Removing lanes on the edge of the roadway to make wider footways as opposed to removing them in the middle and making a wider median for public access
- Removing more than one lane
- Creating a winding landscaped parkway experience (on Sydney Park Road) as opposed to a straighter road
- Widening of pedestrian pathways in front of the station as opposed to widening near Sydney Park
- Considering alternative entrances to the park and locations for crossings
- Exploring different locations for cycleways and parking
- Considering different options for paving, street trees and intersection surfaces.

2.5.2 Identified proposal options

During the strategic design phase, a number of options were considered by Transport for NSW. The two proposal options identified for the project are:

Option A – 'Do nothing'

This option assumes no changes to the road alignment, lane configurations, public space deployment and active transport arrangements of Princes Highway and Sydney Park Road.

Option B – Improve the southern 'gateway' to King Street, Newtown

The Princes Highway carriageway would be reduced to four traffic lanes (two in each direction) and the Sydney Park Road carriageway would be reduced to two traffic lanes (one in each direction). New pedestrian crossings would be provided and traffic signal and lane reconfiguration works would be undertaken at intersections along Princes Highway and Sydney Park Road to improve road safety and traffic flow. The residual road space would be deployed to widen footpaths and provide additional landscaping along Princes Highway and Sydney Park Road and to provide a new two-way on-road segregated cycleway on Sydney Park Road.

The following four sub-options for the deployment of residual open space along Princes Highway were considered:

- Sub-option B-1: Provide a central median strip between northbound and southbound traffic lanes, as an active island of public space
- Sub-option B-2: Widen the footpath and provide landscaping and a new cycleway along the eastern side of Princes Highway, along the frontage of the Sydney Park Brick Kilns Precinct, running from the Sydney Park car park entry to the King Street / Princes Highway / Sydney Park intersection
- Sub-option B-3: Reinstate existing footpaths and provision for dynamic community spaces and mixed-use footpath on both sides of Princes Highway.
- Sub-option B-4: Distribute the lane reduction width on either side of Princes Highway, with equal widths added to both eastern and western sides.

2.5.3 Analysis of options

During workshops with Inner West Council, City of Sydney Council and other key stakeholders, each option was considered against the proposal objectives outlined in Section 2.4. A summary of the analysis is provided in Table 2-2.

Option A – 'Do nothing'

Princes Highway and Sydney Park Road has consistent levels of directional traffic with solid commuter peaks. Doing nothing to improve conditions in the Princes Highway / Sydney Park Road corridor would mean:

- The strategic objectives for this part of Sydney, as outlined in Section 2.1.1 and Section2.1.2, would be compromised. In particular, the do nothing operation would not meet the first, second and fourth proposal objectives
- There would be continued prevalence of traffic accidents involving pedestrians and cyclists. This means the do nothing option would not meet the third and fifth proposal objectives
- The use of active transport (instead of vehicles) would not be encouraged within the road corridor. This means the do nothing option would not meet the sixth proposal objective.

The 'do nothing' option does not meet the proposal objectives and would therefore only be preferred in circumstances where the costs and environmental impacts of proceeding were assessed as outweighing identified benefits. That was not the case and therefore the 'do nothing' option was discarded.

Option B – Improve the southern 'gateway' to King Street, Newtown

This option would address strategic planning objectives (outlined in Section 2.1) and road safety by improving urban amenity and safety, performance and efficiency of intersections along the Princes Highway and Sydney Park Road, while also improving pedestrian and cyclist access between Sydney Park, St Peters Station and surrounding residential areas.

Residual space along Princes Highway sub-options

The following four sub-options were considered for the residual space generated from the lane reductions along Princes Highway:

- Sub-option B-1 would provide a wide central median strip between the northbound and southbound traffic lanes. The central median strip would provide an active island of public space that could be used for pop-up events and landscaping. Since the Princes Highway will remain a State road (with speed limits at 50 kilometres per hour), the central median strip was deemed to potentially pose safety risks for pedestrians crossing to the island and motorists driving in a highly activated space. This option would therefore not address the third and fifth proposal objectives.
- Sub-option B-2 would provide a new footpath, cycleway and landscaping on the eastern side of Princes Highway, along the frontage of Sydney Park and the Brick Kilns Precinct (from the Sydney Park carpark entry to the St Peters intersection). Since this option would potentially impact on the heritage fabric and curtilage of the Brick Kilns Precinct chimney, kilns and grounds, it was not considered to be consistent with the sixth proposal objective.
- Sub-option B-3 would provide dynamic community spaces and mixed-use footpath on both sides of Princes Highway. This option would offer the most viable option for usable public space, with the potential to be activated by current and future businesses along Princes Highway and adjacent streets.
- Sub-option B-4 would provide shared pathways on either side of Princes Highway, with equal widths added to both eastern and western sides. Similar to sub-option B-2, this option would potentially impact on the heritage fabric and curtilage of the Brick Kilns Precinct and was not considered to be consistent with the sixth proposal objective.

Sub-option B-3 would address all the proposal objectives and was selected as the preferred option. This option is discussed further in Section 2.6.

Table 2-2 Analysis of options against proposal objectives

Project Objectives	Does option meet objective?				
Objective	A	B-1	B-2	B-3	B-4
Improve the amenity of the 'gateway' to King Street by enhancing the place function of the area around the entry to St Peters station, and access to Sydney Park along Princes Highway and Sydney Park Road to provide an improved pedestrian environment.	No	Yes	Yes	Yes	Yes
Transform the Princes Highway and Sydney Park Road to achieve a better balanced movement and place outcome.	No	Yes	Yes	Yes	Yes
Improve cyclist movement and safety in the area, particularly to Sydney Park and to St Peters Station, aligning with the draft principal bicycle network.	No	No	Yes	Yes	Yes
Improve pedestrian and cycling connectivity to Sydney Park and improve the place environment of Princes Highway and Sydney Park Road	No	Yes	Yes	Yes	Yes
Improve road safety for all customers.	No	No	Yes	Yes	Yes
Minimise the environmental impact of the development.	No	No	No	Yes	No

2.6 Preferred option

Option B-3 has been identified as the preferred option, that would best meet the proposal objectives by:

- limiting the amount of traffic on King Street/Princes Highway and Sydney Park Road to achieve a better balance for all road users including vehicles, cyclists, buses and pedestrians
- improving the place environment of King Street/Princes Highway and Sydney Park Road through urban design
- utilising the residual roadway space outside trafficable lanes for pedestrian pathways, cycleways, parking and landscaping
- improving safety and access for pedestrians and cyclists by providing new or improved pedestrian/shared pathway crossings
- avoiding potential impacts to the Sydney Park Brick Kilns Precinct along the eastern side of King Street by providing a pedestrian pathway and cycleway along the western side instead
- minimising impacts to utilities and drainage
- avoiding property acquisitions.

The objective of improving the place function of the proposal area is addressed through the landscape design for the proposal, which is provided in Section □.

By utilising the existing road corridor, the environmental and social impacts associated with the construction of new urban corridors have been avoided. Measures to avoid, minimise and mitigate environmental impacts have been developed as part of the assessment process and are detailed in Section 6.

The principles of ecological sustainable development encourage the integration of economic, social development and environmental considerations into the decision-making process for all developments. The development of the proposal is consistent with these principles as demonstrated by the proposal objectives and the alignment of the preferred option with those objectives.

Further information on the preferred option is provided in Section 1 (Description of the proposal).

2.7 Design refinements

A series of refinements were made to the feasibility and strategic designs in response to issues identified by Transport for NSW and feedback received from City of Sydney Council and Inner West Council. These refinements were primarily associated with improving road safety and complying with road design guidelines:

- The geometry of the local roads has been developed to tie into the main alignment and existing local road alignment
- The design has been developed to follow the existing vertical alignment as far as possible to minimise the extent of pavement reconstruction required
- Lane widths on Sydney Park Road were adjusted to provide minimum widths specified by the design criteria
- Curve radii were increased to reduce lane widening required at the Princes Highway / Sydney Park Road intersection
- The existing signalised pedestrian crossing on the southern approach to the Princes Highway / Sydney Park Road intersection was reinstated to improve road safety for pedestrian and cyclist movement between the southern side of Sydney Park Road and the proposed new shared path on the western side of Princes Highway
- May Street was reduced to two lanes (one in each direction) from the kerb tie-in west of Applebee Street (where May Street is currently two lanes) to its intersection with Princes Highway. The

additional width between the existing southern kerb of May Street and the new lane edge was used to increase parking provision by replacing the existing parallel parking with angle parking

- Bus stops at the Princes Highway / Short Street intersection were relocated to the departure side of the signalised crossing to improve pedestrian crossing sight lines
- The length of the bus bay along the eastbound lane of Sydney Park Road was increased to allow two buses to use the bay in tandem
- Indented bus stops were provided on Sydney Park Road to avoid disruptions to traffic
- Through lanes of the eastbound lane of Sydney Park Road were horizontally aligned at the Mitchell Road intersection to introduce a new right turn lane to the Sydney Park car park and to avoid lane changes of through traffic at the intersection
- The bus stop along the eastbound lane of Sydney Park Road near the Mitchell Road intersection was moved from the departure side to the approach side of the intersection
- The right turn from the Sydney Park car park along Sydney Park Road was banned to improve traffic phasing and intersection efficiency
- The existing footpath would remain, and community spaces were added adjacent to both footpaths to maximise options for use of public space
- Pavement drainage design was added to the design.

3. Description of the proposal

3.1 The proposal

Transport for NSW proposes to improve the southern 'gateway' to King Street, Newtown by reducing the capacity of King Street, Princes Highway and Sydney Park Road and improving pedestrian and cyclist access and urban amenity along these road corridors to Sydney Park, St Peters Station, Newtown and surrounding neighbourhoods. The proposal is shown in Figure 1-2 and illustrated in greater detail on the design drawings in Appendix C.

Key features of the proposal would include:

- Reducing the Princes Highway/King Street carriageway from six lanes (generally) to four lanes(two lanes off-peak) from Campbell Street to Sydney Park Road, to accommodate a two way on-road segregated cycleway (on the western side of King Street between May Street and St Peters square), additional landscaping and community spaces to increase urban amenities
- Reducing the Sydney Park Road carriageway from four lanes to two lanes to accommodate a permanent solution for the existing temporary two-way on-road segregated cycleway (northern side), parking and additional landscaping to increase urban amenities,
- New mid-block pedestrian shared crossings to improve access across the Princes Highway/King Street and into Sydney Park, including:
    - A new mid-block pedestrian crossing on Princes Highway north of Short Street.
    - A new mid-block pedestrian and cyclist crossing on Princes Highway between May Street and Goodsell Street.
- Traffic signal and intersection reconfiguration works to improve safety, including:
    - Princes Highway/King Street and Sydney Park Road intersection:
        - King Street southbound approach: Reduce existing three though lanes and one left turn slip lane to a one through lane and one through/left turn lane
        - King Street northbound approach: Maintain existing two through lanes and reduce existing two dedicated right turn lanes to one lane
        - Sydney Park Road approach: Reduce existing two left turn lanes and two right turn lanes to one left turn lane and one right turn lane
        - Replacing existing signalised pedestrian crossing facilities with signalised shared crossing facilities on all approaches
    - Princes Highway/King Street and Goodsell Street intersection:
        - New raised zebra crossing to prioritise pedestrians at the entrance of Goodsell Street
    - Princes Highway/King Street and May Street intersection:
        - Removing traffic signals and re-configuring May Street to left in and left out only movements with a new raised zebra crossing to prioritise pedestrians at the entrance of May Street
    - Princes Highway/King Street and Barwon Park Road intersection:
        - Installing new traffic signals with new pedestrian crossings
    - Sydney Park Road and Mitchell Road intersection:
        - Eastbound approach: Reduce existing two though lanes and one left turn lane to one through lane and a through/left turn lane
        - Westbound approach: Reduce existing one right turn lane, one through lane and one through/left turn lane to one through/right turn lane and one through/left turn lane
        - Mitchell Road approach: Change existing one right turn lane and one right/through/left turn lane to one bus dedicated right turn lane and one through/left turn lane

- Reducing the posted speed limit on Princes Highway from 50 kilometres per hour to 40 kilometres from Campbell Street to Goodsell Street
- Sydney Park carpark access on Kings St will be modified so that Barwon Park Road access will be entry only into the carpark, and King Street will be exit only from the carpark
- Adjustments and relocation of parking spaces along the road corridor
- Road re-surfacing at signalised intersections and along road corridor where required
- Providing dynamic community spaces on both sides of Princes Highway
- Providing landscaped buildouts on Sydney Park Road and Princes Highway
- Relocating the bus stops on Princes Highway near the Short Street intersection, and on Sydney Park Road near the Mitchell Road intersection
- Relocating utilities and adjustments to streetlights where required
- Removing the Princes Highway and Sydney Park Road corridors from the approved B-double freight access network
- Adjusting stormwater to accommodate designed works
- Relocating existing VMS and CCTV camera
- Relocating road signs and line marking works
- Temporary construction facilities, including site compounds and an ancillary facility at Burrows Road and Venice Street, Mascot.

3.2 Design

The feasibility design, architectural representation, and strategic designs were developed in consultation with the City of Sydney Council and Inner West Council.

Following completion of the strategic design stage, it was decided not to proceed with concept design but instead advance directly to detailed design stage. The detailed design was prepared to meet the project objectives, and is described in the following sections. The detailed design plans are included in Appendix C.

3.2.1 Design criteria

Design guides and policies considered during the development of the proposal included, but were not limited, to:

- *King Street, Princes Highway and Sydney Park Road Strategic Design Review Report* (Roads and Maritime Services, 2019)
- Transport for NSW Technical Directions
- Austroads *Guide to Road Design* and Transport for NSW design supplements
- *Beyond the Pavement 2020* (Transport for NSW, 2020a)
- Australian *Rainfall and Runoff 2019*
- Australian Standards and Transport for NSW supplements.

The following considerations have informed the design:

- The proposal objectives, as detailed in Section 2.4
- The urban and landscape design principles, as detailed in the *King Street Gateway Concept Design Report* (Revision F) (McGregor Coxall, 2018)
- Retention of existing pavement as far as possible
- Retention of existing drainage systems as far as possible
- Minimise impacts to existing utilities
- Maximise opportunities for additional landscaping

- Provision of a new cycleway connecting to Goodsell Street in the west and a new City of Sydney Council facility in Mitchell Road
- Minimise adverse environmental impacts.

The adopted design criteria for the proposal is summarised in Table 3-1.

Table 3-1 Proposal design criteria

Key element	Description
Design speed	Princes Highway – 60 kilometres per hour Sydney Park Road – 50 kilometres per hour
Posted speed	Princes Highway – 40 kilometres per hour Sydney Park Road – 40 kilometres per hour
Design vehicle	Princes Highway – 19.0 metre semi-trailer Sydney Park Road – 12.5 metre bus Local roads – match existing
Road width	Princes Highway to be comprised of 3.0 metre through lanes, 3.0 metre turn lanes and 3.2 metre kerbside lanes. Sydney Park Road to be comprised of 3.25 metre through lanes, 3.0 metre turn lanes and 2.6 metre parking lanes.
Shared path	Shared path width to be about 1.7m to 3.6m.
Cycleway width	Cycleway width to be about 2.4m wide.
Footpath width	The new footpath adjacent to Sydney Park Road to be minimum 1.4 metres wide.
Stopping sight distance	Stopping sight distance along Prince Highway/King Street and Sydney Park Road to be 48 metres, which allows for a reaction time of 1.5 seconds at 50 kilometres per hour design speed.
Grade	The vertical grade of the proposal alignment is to match the existing pavement levels as closely as possible.
Tie ins	The proposal is to tie in to the existing road surfaces along all roadways intercepted by the proposal.
Pavement	Alignment to tie into the existing pavement levels where possible to minimise any disturbance to the existing pavement and to minimise the extent of pavement required.
Drainage	The drainage system to manage surface flows and minimise flooding in the 1 in 10 year (10 per cent annual exceedance probability (AEP)) and the 1 in 100 year (one per cent AEP) storm events. Existing pavement levels to be maintained where possible to allow existing drainage to be utilised. Where new kerb lines are provided within the existing carriageway, new drainage pits are to be provided with localised connections into existing drainage lines. The drainage elements are to be designed to provide a design life as below: • New drainage pits and headwalls - 100 years • New drainage pipes and culverts - 100 years.
Utilities	The relocation of utilities to be minimised where possible. Relocations or protection of utilities such as gas, sewer, water, electricity and telecommunications to be designed in consultation with relevant authorities.

Key element	Description
Urban Design and Landscaping	Landscape improvements to link new areas of landscape with the existing landscape of Sydney Park. Areas of planting to be selected where space allows and their presence does not interfere with underground services. Spacing and positioning of new trees to reflect those existing around Sydney Park to provide visual continuity. Species selected for planting to reflect guidance from Inner West and City of Sydney Council towards natives and species tolerant of urban conditions and climate change. Water Sensitive Urban Design (WSUD) principles, such as rain garden beds and tree pits, are to be incorporated into the design to assist in stormwater management where possible. Landscaping elements introduced by recent/planned developments along Princes Highway are to be retained in the landscape design.
Ancillary Sites	Ancillary sites located at Venice Street, Mascot and 12-18 Burrows Street, St Peters.

3.2.2 Engineering constraints

Key engineering constraints considered in the design of the proposal include:

- The existing horizontal and vertical geometry of tie-in designs
- Existing pavement levels are to be maintained where possible
- The existing drainage system is to be utilised where possible. Where existing pits cannot accommodate the new works, they would require replacement. In some areas where new pit and pipe work is proposed, the works are constrained by the existing invert levels
- Utilities: Electrical, gas, telecommunications, water, sewer and stormwater utilities are present in the proposal area. A number of assets would have to be relocated or protected and some utility service covers would have to be adjusted to the new pavement levels. Several existing assets would need to be decommissioned, such as traffic signal connections at May Street, existing Variable Message Sign (VMS) communications and electrical connections and electrical connections to existing bus shelters. New connections would be required for new and relocated traffic signals, relocated VMS and relocated bus shelters.

3.2.3 Major design features

Major design feature 1: Princes Highway/King Street and Sydney Park Road lane reductions

The existing Princes Highway/King Street between Sydney Park Road (to the north) to Campbell Street (to the south) would be reduced from a six-lane divided carriageway (three lanes in each direction) to a four-lane divided carriageway (two lanes in each direction) with a central median. The exiting posted 60 kilometres per hour speed limit on Princes Highway from Campbell Street to Goodsell Street would be reduced to 40 kilometres per hour.

Sydney Park Road would be reduced from a four-lane undivided carriageway to a two-lane undivided carriageway.

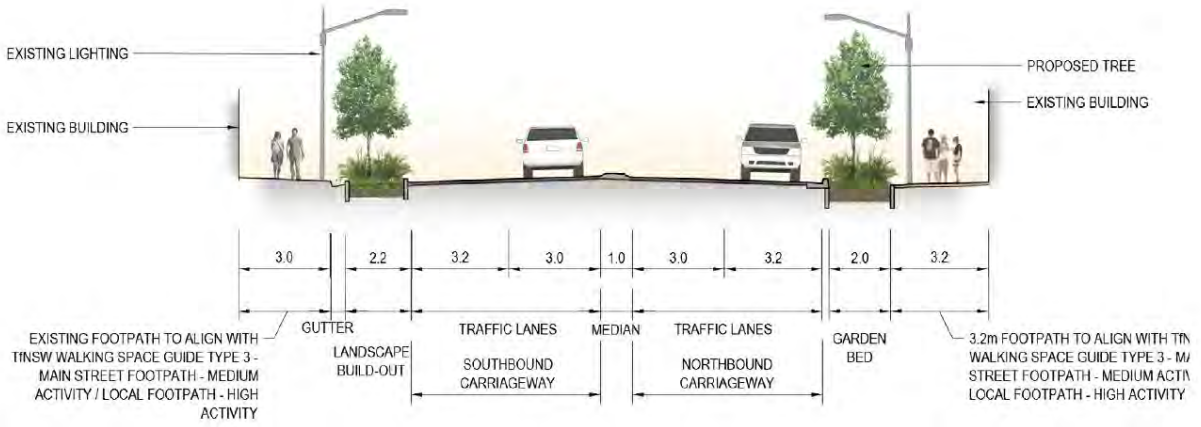

Figure 3-1 Princes Highway Typical Cross Section

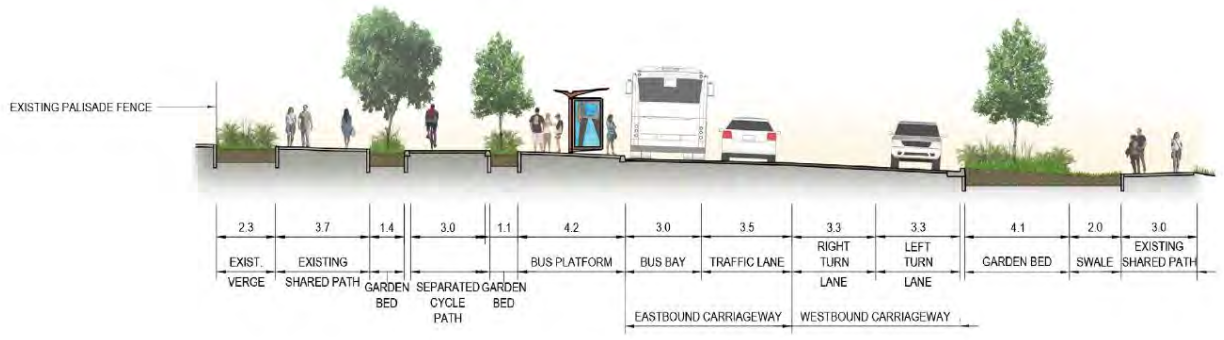

Figure 3-2 Sydney Park Road Typical Cross Section

Major design feature 2: Intersections improvements

Campbell Street / Princes Highway

The intersection of Campbell Street and the Princes Highway was upgraded as part of the WestConnex Stage 2 project. The upgraded intersection provides three lanes on the southbound approach to the intersection (one through and left lane, one through lane and one right turn lane) and two through lanes (widening to three almost immediately) on the northbound departure from the intersection.

The southbound approach to the intersection would remain unchanged. To harmonise with the adjusted cross section of the Princes Highway, the northbound departure from the intersection would be adjusted to provide only two through lanes.

Figure 3-3 Campbell Street / Princes Highway intersection

Short Street / Princes Highway

The existing left in/left out unsignalised intersection with the Princes Highway would be modified to tie into the Princes Highway adjusted kerb line.

Figure 3-4 Short Street / Princes Highway intersection

Barwon Park Road / Princes Highway

The intersection of Barwon Park Road and Princes Highway would be upgraded to a three-way signalised intersection. The existing slip lane from Princes Highway southbound would be removed and replaced with a left in at the reconfigured intersection. Pedestrian crossings would be provided on all three intersection legs providing pedestrian connectivity along and across the Princes Highway.

A dual lane approach and single lane departure would be provided on Barwon Park Road and dual lane approach and departures would be provided on Princes Highway northbound and southbound.

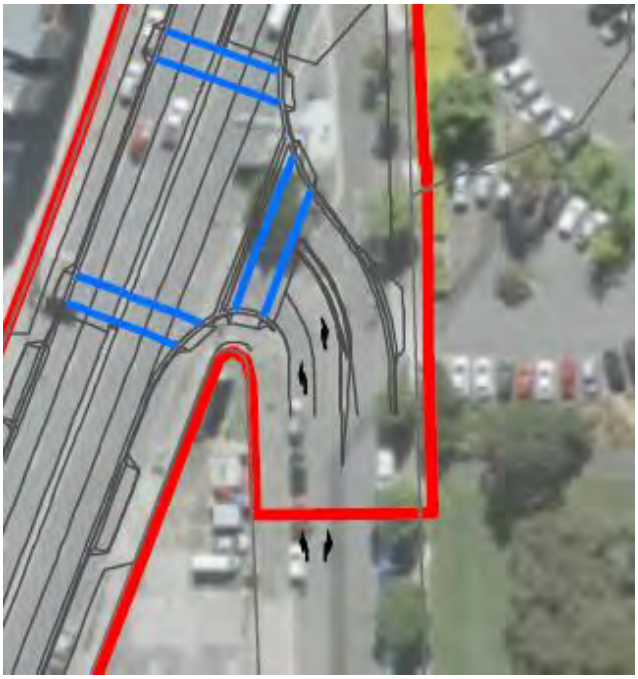

Figure 3-5 Barwon Park Road / Princes Highway intersection

May Street / Princes Highway

The existing signalised intersection of May Street and the Princes Highway would be reconfigured from a three-leg signalised intersection catering for all movements, to an unsignalised left in / left out only intersection. May Street would be reduced from four lanes (two in each direction) to two lanes (one in each direction) at the intersection with the Princes Highway. A raised “bent-out” crossing would be provided adjacent to the intersection to provide priority crossing for cyclists and pedestrians.

Figure 3-6 May Street / King Street / Princes Highway intersection

Goodsell Street / King Street

The approach to the intersection would be narrowed from two lanes to provide a centrally located single lane. Consequently, there would be a marginal decrease to the existing parking provision on both sides of the carriageway.

A raised “bent-out” crossing would be provided adjacent to the intersection to provide priority crossing for cyclists and pedestrians.

Figure 3-7 Goodsell Street / King Street intersection

Sydney Park Road / King Street

The existing three-way signalised intersection would be reconfigured to provide the following lanes (shown in Figure 3-8):

- The northbound approach of King Street would be reduced from two right turn lanes to one right turn lane
- The northbound departure of King Street would be reduced from three through lanes to two through lanes
- The southbound approach from King Street would be reconfigured from three through lanes and one unsignalised left turn lane to one through lane and one through and left lane
- The southbound departure of King Street would be reduced from three through lanes to two through lanes
- The westbound approach of Sydney Park Road would be reduced from two left turn lanes and two right turn lanes to one left turn lane and one right turn lane
- The eastbound departure of Sydney Park Road would be reduced from two through lanes to one through lane.

Existing signalised pedestrian crossing facilities would be replaced with signalised pedestrian and cyclist crossings.

The intersection would be designed to cater for a 12.5 metre design vehicle. This would be downgraded from the 19.0 metre design vehicle (26.0 metre B-double check vehicle) nominated in the strategic design after it was confirmed by Transport for NSW that Sydney Park Road would no longer be considered a B-double route.

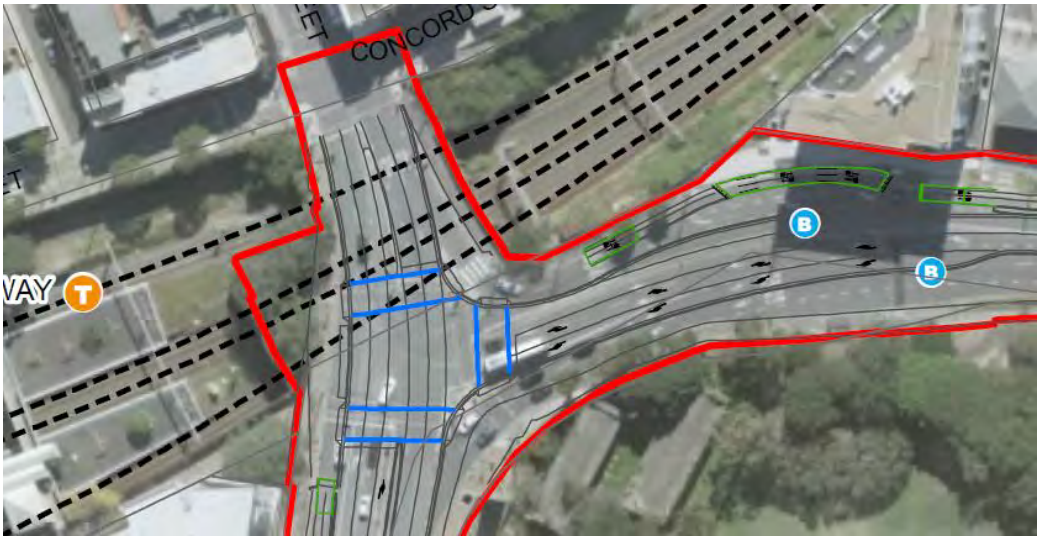

Figure 3-8 Sydney Park Road / King Street intersection

Concord Street / Lord Street / King Street

The existing four-way signalised intersection would be largely maintained, with minor adjustments to the geometry and kerbing on the southern leg. The existing southern departure leg would be reduced from two lanes with a third (left turn lane) developing to two lanes.

Mitchell Road / Sydney Park Road

The existing four-way intersection of Mitchell Road, Sydney Park Road and the Sydney Park car park would be reconfigured to provide the following lanes:

- The eastbound approach of Sydney Park Road would be reconfigured from two through lanes and one left turn lane (no right turn permitted) to one through and left turn lane and one through and right turn lane.
- The eastbound departure of Sydney Park Road would be reduced from three through lanes to two through lanes (reducing to one)
- The westbound approach to Sydney Park Road would be reconfigured from one through and left turn lane, one through lane and one right turn lane to one through and left turn lane and one through and right turn lane
- The Mitchell Road approach would be reconfigured from one through, left and right turn lane and one right turn lane to one through and left turn lane and one right turn lane for buses only.
- The Sydney car park approach would be reconfigured from one lane (all movements permitted) to one through and left turn lane (no right turn permitted).

The mixture of pedestrian only and pedestrian and cyclist signalised crossing facilities provided in the existing intersection configuration would be replaced with signalised pedestrian and cyclist crossings on all legs.

Figure 3-9 Mitchell Road / Sydney Park Road intersection

Euston Road / Sydney Park Road

The intersection of Euston Road and Sydney Park Road was upgraded as part of the WestConnex Stage 2 project. The upgraded intersection provided three lanes on the eastbound approach to the intersection (one left lane, one through lane and one right turn lane) and two through lanes on the westbound departure from the intersection. The design ties into the existing lane configuration and the intersection remains unchanged.

Major design feature 3: Pedestrian and cyclist facilities

Footpaths

All existing footpaths would remain with amendments to:

- The existing footpath along Princes Highway would have varying widths between existing kerb and new kerb
- The existing footpath on the northern side of Sydney Park Road, from Mitchell Road, would combine with the new on-road separated cycle path
- The existing footpath on the western side of Mitchell Road, from Sydney Park Road, would combine with the new off-road separated cycle path
- The existing footpath along the eastern side of Princes Highway, from the signalised crossing north of May Street, to Sydney Park would be reassigned as a shared path.

Shared paths

All existing shared paths would remain with amendments to:

- The existing shared path along the eastern side of Princes Highway, from Concord Street, would have an additional width of up to 5.5m for certain sections of the path. The path would tie in between the existing kerb and new kerb.

Cycleways

An on-road separated cycleway would be provided along Sydney Park Road between Princes Highway and Mitchell Road. The cycleway would be separated from the adjacent carriageway by a raised median.

An on-road separated cycleway would also be provided along King Street between May Street and St Peters square. The cycleway would be separated from the adjacent carriageway by a raised median.

On the western side of Mitchell Road between Sydney Park Road and the limit of the proposal area, a new off-road separated cycleway would be provided.

Pedestrian and cyclist crossings

In addition to crossing facilities provided at the signalised intersections, the following three unsignalised crossings (two shared use and one pedestrian) and two signalised crossings (one pedestrian and one shared use) would be provided:

- A new mid-block pedestrian shared crossing on Princes Highway would be provided immediately north of the intersection with Short Street
- A new mid-block separated crossing (pedestrian and cyclists) on Princes Highway between May Street and Goodsell Street (this will provide a new entrance to Sydney Park)
- City of Sydney Council has recently installed a signalised mid-block pedestrian crossing on Sydney Park Road, between the King Street and Mitchell Road. This crossing will be maintained.
- A raised ("bent-out") crossing would be provided at the intersection of May Street and Princes Highway/King Street, allowing continuation of the shared path which extends along King Street
- A raised crossing would be provided at the intersection of Goodsell Street and King Street, allowing continuation of the shared path which extends along King Street.

Major design feature 4: Public transport facilities

- The bus stop along the northbound lane of Princes Highway, south of Short Street would be relocated north of Short Street. The bus stop along the southbound lane of Princes Highway north of Short Street would be relocated south of the signalised pedestrian crossing at Short Street
- The existing bus bay along the eastbound lane of Sydney Park Road would be relocated to the new kerb position, and a raised island would be provided between the on-road cycleway and the new kerb line. This raised island would accommodate the bus shelter
- The existing bus stop along the eastbound lane of Sydney Park Road, east of the Mitchell Road intersection would be relocated west of the Mitchell Road intersection, at the start of the left turn lane
- The existing bus stop along the westbound lane of Sydney Park Road, east of the Mitchell Road intersection, would be removed and the bus stop west of the intersection would remain
- The bus bay along the westbound lane of Sydney Park Road would be removed and the bus stop would be relocated to the start of the left turn lane to King Street.

Major design feature 5: Parking facilities

- New angled parking bays and parallel parking bays would be provided on May Street
- New parallel parking bays would be provided along the southern side of Sydney Park Road, between the turn lanes on approach to King Street and the end of the dual lane departure at Mitchell Road. The parking lane would be interrupted midway by the newly council installed signalised pedestrian crossing, and intermittent landscaped kerb extensions
- Access to the existing Sydney Park car park off Princes Highway would be retained, although the access changes from entry only off Barwon Park Rd and exit only onto Princess Highway.

Major design feature 6: Drainage

Existing drainage systems within the proposal area would be maintained and reused where feasible to avoid new trenching and rework of the existing pavement.

The main drainage features that would be installed as part of the proposal include:

- Modification of existing drainage pits or new drainage pits and pipes to accommodate existing constraints
- A number of drainage solutions would be implemented for the Princes Highway interface, these include:
    - Concrete surface V drains,
    - Additional pit and pipe,
    - In-situ concrete channel with grate

    The solution was developed in coordination with landscaping and urban planning, the future asset holder, the road design, existing utilities and future infrastructure. The solution was based on best performance, constructability and feasibility.
- At the newly council installed signalised crossing in Sydney Park Road, the gutter would be re-constructed into a channel to pass the flow through to the downstream kerb. The channel will be covered by a grate suitable for the pedestrian crossing
- Breaks in the kerb along Sydney Park Road and King St/Princes Hwy to allow flow to pass into the existing gutter.

Major design feature 7: Pavements

Pavement reconstruction would be minimised where possible. The existing pavement along the Princes Highway, King Street and Sydney Park Road is generally in good condition, apart from some localised pavement distresses. Mill and re-sheet treatment would be undertaken in these areas to improve the pavement condition.

New pavements would be required in areas such as:

- Shared paths
- Cycle paths
- Raised medians
- Narrow widening of the existing medians
- The Barwon Park Road intersection approach.

The need for rehabilitation work, which could include replacement of the existing pavement, would be established during construction and would include pavements at:

- May Street
- King Street / Sydney Park Road intersection.

Major design feature 8: Landscaping

The landscape design would aim to visually link new landscaped areas with the existing parkland in Sydney Park. Landscape improvements would include enhancements to existing landscaped areas and new landscape elements.

One aim of the proposal is to improve the streetscape by adding tree cover and visually narrowing the road corridor. Areas for planting would be selected where space allows and where their presence does not interfere with underground services. Further opportunities for planting would arise where the road is narrowed or physical segregation is needed between vehicles, cyclists and/or pedestrians. For example, pedestrian movements crossing the cycleway to access the bus stop at the western end of Sydney Park

Road would be controlled by the positioning of linear shrub beds alongside the footpath to limit access and therefore reduce the potential risk of clashes with cyclists.

Water Sensitive Urban Design (WSUD) principles would be incorporated into the landscape design, where possible. Two broad typologies have been identified to date to ameliorate surface water flow:

- Tree pits within areas of hardstand such as pavements
- Rain garden beds, to physically and visually separate blocks of on-street parking on Sydney Park Road.

New street trees would be introduced to extend and enhance existing avenues and improve canopy cover and to give shade to pedestrians in the street. Spacing and positioning of the new trees would reflect those existing around the park to provide visual continuity. Species selected for planting would include native species and species tolerant of urban conditions and climate change.

Major design feature 9: Intelligent Transport Systems (ITS)

The existing Variable Message Sign (VMS) located on the traffic island at the intersection of Princes Highway and Barwon Park Road was installed as part of the WestConnex Stage 2 project. Due to the adjustments to the Barwon Park Road intersection, this VMS would need to be relocated.

A new Closed Circuit Television (CCTV) unit would be provided at the Princes Highway / Barwon Park Road intersection. Two existing CCTV units at the King Street / Sydney Park Road intersection would be relocated.

3.3 Construction activities

This section provides a summary of the likely construction methodology, staging, work hours, plant and equipment that would be used to construct the proposal and associated activities. For the purpose of this REF, an indicative construction plan and methodology are provided.

The detailed construction staging plans and methods would be confirmed by the construction contractor(s) after completion of the detailed design. The actual construction methods may vary from the description in this chapter due to:

- The identification and location of underground utilities and services
- On-site conditions identified during pre-construction activities
- Ongoing refinement of the detailed design
- Community consultation, including consideration of submissions received
- S0tatutory requirements, including any work, health and safety (WH&S) regulations and conditions of approval issued following determination of REF
- Identified efficiencies and improvements of environmental impacts to construction methodology.

A contractor environmental management framework to manage and mitigate impacts is presented in Section 7. The final construction plan and methods chosen by the contractor would also be required to be consistent with this framework.

3.3.1 Work methodology

The proposal would be constructed in two main construction zones over approximately 20 months from early 2022 to late 2023:

- Zone A: Princes Highway – Campbell Street to Sydney Park Road
- Zone B: Sydney Park Road – Princes Highway to Euston Road.

The construction would take place during three main stages in each of the two construction zones:

- Stage 0: Preparation works for future stages (investigations, removing median slabs, installing temporary pavement, drainage adjustments and relocations) are to be undertaken. Major components would also be constructed in some areas which would include drainage installation
- Stage 1: Permanent works are to commence construction, and would include drainage installation, kerb and pavement construction and landscape works
- Stage 2: Permanent works construction are to continue after Stage 1 which would include drainage installation, kerb and pavement construction and landscape works.

The staged approach to construction is proposed to meet the following conditions:

- Minimum number of lanes agreed with CBD Taskforce and Transport Management Centre (TMC) are maintained, including turning lanes and length of storage
- Lane widths may be reduced as agreed by TMC / Sydney Coordination Office (SCO) to suit the proposed staging
- Speed limit reduced to 40 kilometres per hour approaching and next to construction works
- Driveway access to properties are maintained, or alternate arrangements made where required
- Pedestrian access is maintained as agreed by TMS / SCO to suit the proposed traffic staging.

Table 3-2 Proposed indicative construction staging

Stage	Time of day	Proposed construction work	Changes to traffic conditions
Zone A: Princes Highway/King Street – Campbell Street to Sydney Park Road			
0	Night/day	• Drainage: modify median drainage, install trafficable grates • Civil: remove median, install temporary pavement to allow for future traffic switches.	• Traffic conditions in accordance with road occupancy licence (ROL) requirements. No daytime changes to traffic.
1a	Day	The Stage 1a construction works would take place on the western side of Princes Highway/King Street, including the north-eastern corner of the King Street / Sydney Park Road intersection: • Traffic switch: adjust signage, linemarking and Traffic Control Systems (TCS) / ITS to establish construction zone • Drainage: trench to install stormwater pipes, adjust and install stormwater pits, construct interface drains and trench drains • Utilities: adjust existing TCS, install new TCS • Civil: remove trees, remove kerbs, trench and construct new kerbs, install footpaths and pavements, landscaping.	• Traffic conditions in accordance with road occupancy licence (ROL) requirements. No daytime changes to traffic. • Two northbound lanes and two southbound lanes operating on Princes Highway/King Street between Sydney Park Road and Barwon Park Road • Two northbound lanes and one southbound lane operating on Princes Highway between Barwon Park Road and Campbell Street. Lanes would be moved to the eastern side of the road.
1b	Day	The Stage 1b construction works would take place on the western side of King Street/Princes Highway between Sydney Park Road and Barwon Park Road, and eastern side of Princes Highway between Barwon Park Road and Campbell Street: • Traffic switch: adjust signage, linemarking, and TCS / ITS to establish construction zone • Drainage: trench to install stormwater pipes, adjust and install stormwater pits, construct interface drains and trench drains • Utilities: adjust existing TCS, install new TCS • Civil: remove kerbs, trench and construct new kerbs, install footpaths and pavements, landscaping.	• Two northbound lanes and two southbound lanes operating on Princes Highway/King Street between Sydney Park Road and Barwon Park Road • Two northbound lanes and one southbound lane operating on Princes Highway between Barwon Park Road and Campbell Street. Lanes would be moved to the western side of the road.

Stage	Time of day	Proposed construction work	Changes to traffic conditions
2	Day	The Stage 2 construction works would take place on both sides of Princes Highway: • Traffic switch: adjust signage, linemarking, and TCS / ITS to establish construction zone • Drainage: trench to install stormwater pipes, adjust and install stormwater pits, construct interface drains and trench drains • Utilities: adjust existing TCS, install new TCS • Civil: remove kerbs, trench and construct new kerbs, medians, footpaths and pavements, landscaping, mill and re-sheet roadway.	• Two northbound lanes and two southbound lanes operating on King Street/Princes Highway between Sydney Park Road and Campbell Street.
Zone B: Sydney Park Road – King Street to Euston Road			
0	Night	• Drainage: modify median drainage, install trafficable grates, install new drainage • Civil: remove median, install temporary pavement to allow for future traffic switches.	• Traffic conditions in accordance with ROL requirements. No daytime changes to traffic.
1	Day	The Stage 1 construction works would take place on the northern side of Sydney Park Road: • Traffic switch: adjust signage, linemarking, and TCS / ITS to establish construction zone • Drainage: trench to install stormwater pipes, adjust and install stormwater pits, construct interface drains and trench drains • Utilities: adjust existing TCS, install new TCS • Civil: remove trees, remove kerbs, trench and install new kerbs, footpaths and pavements, rehabilitate cycleway.	• One westbound lane and one eastbound lane operating on Sydney Park Road between King Street and Euston Road.

Stage	Time of day	Proposed construction work	Changes to traffic conditions
2	Day	Stage 2 construction works would take place on both sides of Sydney Park Road: • Traffic switch: adjust signage, linemarking, and TCS / ITS to establish construction zone • Drainage: trench to install stormwater pipes, adjust and install stormwater pits, construct interface drains and trench drains • Utilities: adjust existing TCS, install new TCS • Civil: remove kerb, trench and construct new kerb on southern side, construct median kerb and pavement, landscaping, mill and re-sheet roadway.	• One westbound lane and one eastbound lane operating on Sydney Park Road between King Street and Euston Road.

Construction activities in each of the two zones are divided into four phases and include:

- Pre-construction activities
- Daily site activities
- Road upgrade construction activities
- Post construction activities.

Each of the construction activities associated with these four phases are described in Table 3-3.

Table 3-3 Proposed construction activity

Phase	Activities
Pre-construction activities	• Finalisation and approval of the Construction Environmental Management Plan (CEMP) • Utilities investigation • Geotechnical investigations and survey • Installation of temporary safety barriers where required. This would include end measures to ensure safety of temporary traffic arrangements and protection of construction zone from traffic • Ensuring that all temporary erosion and sediment controls are in place • Removal of all redundant road surface markings before traffic switches and installation of new temporary markings in accordance with Transport for NSW specification R141 – Pavement Marking • Establish ancillary sites, temporary equipment laydown areas and stockpile sites • Establish construction site entry and exit points • Establish environmental controls in accordance with CEMP • Installation of construction fencing and screening • Clearing and grubbing of vegetation • Transport plant and equipment to the site.
Daily site activities	• Establish temporary amenities and environment and safety controls • Establish traffic management measures and detours including provision of alternative pedestrian and cyclist pathways as required • Remove waste and clean-up site, including road sweeping • Remove temporary traffic controls • Remove temporary amenities and environment and safety controls • Reopen traffic lanes (if closed).
Road upgrade/ drainage/utility relocation construction activities	• Relocation of existing utilities (power, gas, telecommunications, water, sewer and stormwater) • Removal of trees • Construction of new drainage connections and modification of existing drainage connections • Construction of new pit and pipe drainage, trench drains and interface drains • Relocation of utilities and streetlights • Reconfiguration of existing road lanes • Construction of pedestrian/shared crossings • Construction of new kerbs to reduce road pavements • Rehabilitation/reconstruction of existing pavements, final surfacing and restorations • Reconstruction of pedestrian and shared pathways • Installation of road furniture and signage • Landscaping.

Phase	Activities
Post-construction activities	• Transport stockpiled waste and spoil to licensed facility • Clean up and decommissioning of the construction site compounds, temporary equipment laydown areas and stockpile sites • Remove plant and equipment from site • Remove construction environmental controls • Reinstate the site, roadways and all property accesses.

In addition to the phasing of construction activities for each of the two separate construction zones, a number of sub-stages have been identified for each construction zone to allow for ongoing traffic flow through the construction zone via the implementation of lane closures and traffic switches. There would also be day time and night time activities. The proposed indicative construction sub-stages for each of the two zones are summarised in Table 3-2. The works proposed for each of the sub-stages could change due to, for example, a change in design or if unexpected finds are uncovered.

3.3.2 Construction workforce

The construction workforce would be expected to fluctuate, depending on the stage of construction and associated activities. The workforce would be expected to be between about 35 and 40 personnel at any given time during the construction period. The final number of construction workers would be determined by the construction contractor.

3.3.3 Construction hours

Where possible, construction would be carried out during standard construction working hours in accordance with the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) as follows:

- Monday to Friday: 7:00am to 6:00pm
- Saturday: 8:00am to 1:00pm
- Sunday and public holidays: No work.

To minimise disruption to daily traffic and disturbance to surrounding land owners and businesses, it would be necessary to carry out some work outside of these hours. For example, it is expected that out of hours work would be required for works within the road median. Out of hours work would be subject to permitted road occupancy licences (ROLs) and construction staging.

All work would be carried out in accordance with the ICNG (DECC, 2009), *Construction Noise and Vibration Guideline* (Roads and Maritime, 2016) and the *Noise Criteria Guidelines* (Roads and Maritime, 2015a). In addition, safeguards and management measures detailed within the CEMP would be implemented as required to further mitigate any construction impacts.

The local community would be notified a minimum of five days prior to work outside of standard hours commencing. They would be provided with work details and contact information if there are any issues.

A noise and vibration assessment has been carried out for the proposal. Refer to Section 6.2 and Appendix D for details.

3.3.4 Plant and equipment

An indicative list of plant and equipment that would typically be required during construction of the proposal is provided below. Additional equipment would likely be used and would be identified during detailed design by the construction contractor. Indicative equipment includes:

- 2t Tipper
- Asphalt Paver
- Asphalt Truck and Sprayer
- Backhoe
- Bobcats/pozitrack
- Cable drum/winch
- Chainsaw 4-5hp
- Cherry Picker
- City Crane (for large trees)
- Compressor
- Concrete Saw
- Concrete Truck
- Concrete Vibrator
- Drills
- Dump Truck
- Dump Truck (Bogie Truck) / 2t Tipper
- Dump Truck (Truck & Dog)
- Elevated work platforms
- Excavator (tracked) 20t
- Excavator (tracked) 35t
- Excavator (tracked) 5-12t (for stumps only)
- Excavator with rock hammer
- Forklifts
- Franna Crane
- Franna Crane 20t
- Front End Loader
- Graders
- Hand Tools
- Jackhammer
- Lighting Towers
- Light Vehicles
- Line Marking Truck
- Pavement Laying Machine
- Pavement Profiler
- Piling Rig
- Plate Compactor/Tamper Rammer
- Pneumatic Hammer
- Power Generator
- Pulvi-mixers
- Road saw
- Road Truck
- Road Truck (Bogie)
- Road Truck (Hiab)
- Scissor Lift
- Scissor Lift / EWP (O/H Power relocation)
- Screed boards (petrol driven)
- Semi-trailer and flatbed trucks (for deliveries)
- Skid Steer
- Slew Crane
- Slip-Forming Machine
- Smooth Drum Roller
- Spray Seal Equipment
- Staff vehicles
- Truck Compressor
- Tub grinder/mulcher 40-50hp
- Underborers
- Vacuum Truck
- Vibratory Roller
- Vibratory Roller 20-30t
- Water carts
- Welding Equipment

3.3.5 Earthworks

The majority of the proposal would maintain the existing pavement levels, with minimal earthworks proposed. As such, earthworks for the proposal would generally be limited to minor excavation for pavement widening and pavement reconstruction. The proposal would aim to maximise the re-use of material on site, to reduce material import, and minimise traffic movements on the road network in and around construction zones.

The estimated quantities of materials associated with earthworks are provided in Table 3-4. The estimates may change depending on the actual quality of material, the depth to bedrock, and the suitability of the material for re-use in construction. Earthwork requirements would be confirmed during detailed design.

Table 3-4 Indicative earthworks quantities

Material	Estimated volume (tonnes)
Excavation (cut) volume	6,000
Fill volume (imported or borrowed)	6,000
Excess (to spoil)	6,000

3.3.6 Source and quantity of materials

Construction materials

The major materials that would be required from the proposal include concrete, SMZ and pavement gravels and asphalt.

Estimated quantities of construction materials are outlined in Table 3-5.

Table 3-5 Summary of material quantities

Material	Estimated quantity
Asphalt	5,000 tonnes (t)
Concrete	750 cubic metres (m^3)
New pavement (SMZ)	4,000 tonnes
Milling	22,000 square metres (m^2)
Median	1,500 m^2
Shared pathways and wider footpaths	2,200 m^2

The source and quantity of materials required to construct the proposal would be finalised during detailed design through the development of a construction materials and resources plan. Where possible, materials would be sourced from quarries nearby from appropriately licensed commercial suppliers within the Sydney region, recycled building material suppliers or other viable sources such as other nearby infrastructure projects. None of the materials proposed to be used are considered to be in short supply.

Surplus material that cannot be used on site would be classified in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014) and transferred to other Transport for NSW projects for immediate re-use in line with the NSW Environment Protection Authority (EPA) Excavated Public Road Material Resource Recovery Exemption or disposed of at an approved materials recycling or waste disposal facility.

Water

Water would be required for earthwork and dust control. The volume of water required for construction is unknown at this stage and would depend on material sources and methodologies applied by the construction contractor. Water would be sourced from authorised off-site sources, including recycled and re-used water and groundwater bores.

Surplus materials

Surplus material that cannot be used as part of the proposal would be transferred to a Transport for NSW approved temporary stockpile site for future use during projects or routine maintenance, where possible.

- Transfer to a Transport for NSW approved site for reuse on a concurrent private and/or local government project (with appropriate approvals as required)
- Disposal at an approved materials recycling or waste disposal facility
- As otherwise provided for by the relevant waste legislation.

The process for managing excess material would be detailed in a waste management plan that would form part of the CEMP (refer to Section 6.11).

3.3.7 Traffic management and access

As described in Section 3.1, pedestrian, cyclist and road traffic would be impacted during all stages of construction. Construction has been staged to allow the existing road corridor to remain open to traffic, cyclist and pedestrian movements during construction. Potential impacts to pedestrian, cyclist and road traffic have been provided in Section 6.1.

Construction traffic volumes

Construction activities would generate traffic for the movement of construction workers, plant, equipment and materials and would include vehicles and light and heavy trucks.

During normal working days, about 20 heavy vehicle and 60 light vehicle movements would be required per day across the proposal area. During peak construction periods, up to 40 heavy vehicle and 120 light vehicle movements would potentially be required per day for construction. Construction traffic would peak during stormwater, road furniture and concrete works. Construction vehicles would generally access the proposal from major roadways feeding into the proposal, such as Euston Road and Campbell Street/Campbell Road.

Site access for construction vehicles

Construction vehicles would access the proposal area from the western and eastern extents of the construction, i.e. via Campbell Street and Euston Road. It is anticipated that construction traffic movements in each of the two construction zones would adopt a “left-in, left-out” access arrangement.

Access to discrete work zones would be managed by traffic controllers directing the movements of construction vehicles from pre-determined temporary waiting areas in the surrounding construction vehicle allowable road network, to travel into the work zone as directed.

Construction workers would generally arrive by car and park at the ancillary facilities (see Section 3.4). Construction personnel would then access the work zones from the ancillary facilities via pedestrian access or through vehicle access in mini bus type vehicles to reduce vehicular movements.

Access management

As described in Section 3.3.1, daytime lane closures are proposed along the Princes Highway/King Street and Sydney Park Road corridors (construction zones A and B) during the various construction stages. The following traffic lanes would be operational during construction:

- Four lanes along Princes Highway/King Street (two lanes in each direction) between Sydney Park Road and Barwon Park Road
- Three lanes (two northbound lanes and one southbound lane) along Princes Highway between Barwon Park Road and Campbell Street during Stage 1 and four lanes (two northbound lanes and two southbound lanes) along Princes Highway between Barwon Park Road and Campbell Street during Stage 2
- Two lanes (one westbound lane and one eastbound lane) along Sydney Park Road

Night works are proposed in both zones in order to minimise the traffic impacts during construction. Access for emergency services and bus services would be maintained during construction. Consultation with emergency services and bus operators would be undertaken before any changed traffic conditions are implemented.

Access to properties and businesses along the proposal would be maintained during construction. Temporary property access would be provided to residences and businesses where required. The management of property access would be considered by the construction contractor and detailed as part of the final staging plan for the proposal.

Construction traffic management plan

Standard traffic management measures would be employed to minimise short-term traffic impacts that could be expected during construction. A detailed construction Traffic Management Plan (TMP) would be prepared in accordance with the *Traffic Control at Work Sites Technical Manual Version 5.0* (Roads and Maritime Services, 2018) and *Specification G10 – Traffic Management* (Transport for NSW, 2020) and would need to be approved by Transport for NSW before implementation. The TMP would provide details of traffic management to be implemented during construction to ensure that traffic flow along the proposal is maintained where possible.

Access to and from all roads intersecting with the proposal area would be maintained while the proposal is being built. A reduced speed limit of 40 kilometres per hour would be introduced in the proposal area for the duration of the work. To avoid major congestion, lane closures would occur along Princes Highway, King Street and Sydney Park Road in consultation with the Transport Management Centre.

Vehicular access to and from the proposal area would be from Euston Road and Campbell Street/Campbell Road. The TMP would detail specific haulage routes that construction traffic would follow during the construction phase. Haulage routes are expected to be via Campbell Road and Euston Road to Princes Highway (south of the proposal) and the St Peters Interchange which connects to the M8 Motorway (Stage 1) and the M4 - M5 Link Tunnels about 300 metres south east of the proposal.

Impacts to the public (including traffic, pedestrians and cyclists) during construction would be managed through the TMP and detailed traffic control plans would be prepared. Pedestrian and cyclist routes would be managed on a regular basis to suit construction activities. These routes would be coordinated with the stages of construction to ensure safe access.

Bus stops requiring relocation during construction would be carried out in consultation with City of Sydney Council, Inner West Council, Transport for NSW and the local bus operators. Any proposed relocation would consider implications for commuters. Additional access for garbage trucks during construction would be taken into account.

Further details about the potential traffic impacts during construction are provided in Section 6.1.

3.4 Ancillary facilities

Temporary ancillary facilities would be required during the construction phase for the stockpiling of materials and spoil, storage of equipment and plant and project administration.

The sites at the end of Venice Street, Mascot and 12-18 Burrows Road, St Peters would be used as ancillary facilities throughout the construction of the proposal. The Venice Street and Burrows Road sites are located approximately 800 metres and 670 metres directly south from the southern end of the proposal area, as shown in Figure 3-10.

The land on which the Venice Street and Burrows Road sites are located is zoned as IN1 General Industrial under the *Marrickville Local Environmental Plan 2011* and the *Sydney Local Environmental Plan 2012* respectively. Surrounding land uses to these sites are industrial and commercial in nature with no sensitive receivers in proximity to the proposed sites. These sites are owned by TfNSW.

During construction, the Venice Street and Burrows Road sites would consist of:

- Car park spaces
- Water tank
- Project office/administration
- Site amenities.
- Material laydown area
- Site amenities.

The site at Burrows Road would be used simultaneously by another project as an ancillary site. This is not expected to disrupt ancillary site use for Sydney Park Junction.

Additional compound and stockpile sites may be required for equipment laydown, stockpiling and staff parking. The location of these sites would be confirmed prior to construction. Consultation with the relevant local council(s) would be undertaken to confirm the suitability of the locations and whether any additional environmental assessment is required.

The following criteria would be considered when selecting suitable locations for compound sites:

- Not prone to flash flooding and more than 40 metres from a watercourse, where possible
- A suitable distance away from residential dwellings and other land uses that may be sensitive to noise and heavy vehicle traffic
- Accessible by heavy vehicles and allow for truck turning movements
- In previously disturbed areas that do not require the clearing of native vegetation
- Away from areas of heritage conservation value.
- Outside the drip line of trees and on level ground wherever possible
- In plain view of the public to deter theft and illegal dumping.

All compounds would be established in accordance with relevant Transport for NSW guidelines. The compound sites would be securely fenced with temporary fencing and signs would be erected advising the general public of access restrictions and contact details in the event of emergency or incident. Following construction, the compound sites would be removed, and the sites would be cleared of all rubbish and materials and rehabilitated to their existing condition or as otherwise agreed with the landowner on completion of works.

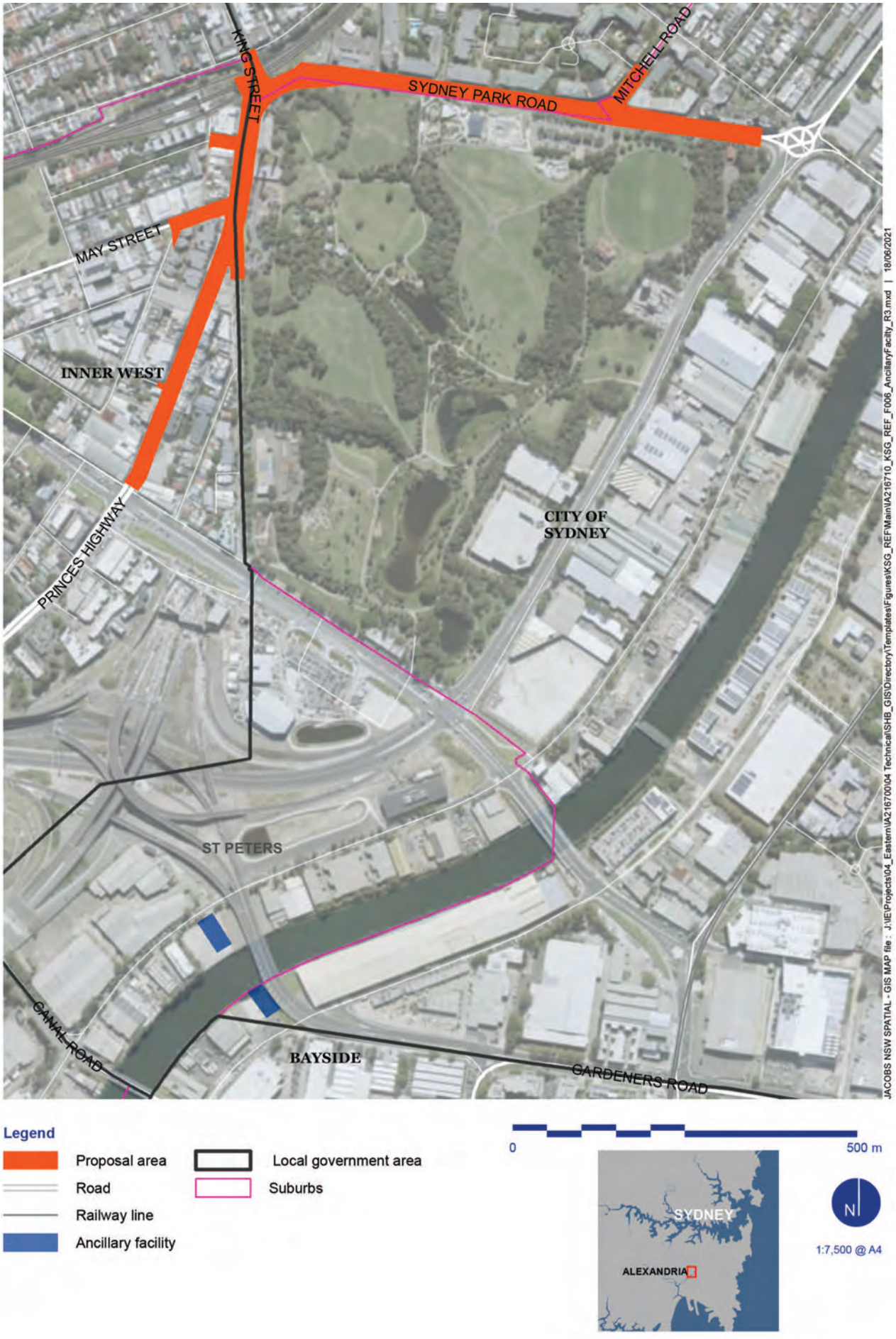

Figure 3-10 Ancillary facilities

3.5 Public utility adjustment

The utilities present within the proposal area include:

- Electrical supply and Street Lighting, Transgrid, Ausgrid, Railcorp 1, Sydney Desalination Plant
- Gas – Jemena
- Telecommunications (optic fibre and telephone) – Telstra, Optus / Uecomm, Vocus, Verizon Business, Fibre Sense, Luminet, National Broadband Network (NBN), Pipe Network and Primus Telecom, Railcorp 1, Transport for NSW
- Water – Sydney Water, Sydney Desalination Plant
- Sewer – Sydney Water
- Stormwater – Inner West Council
- Private electrical supply – City of Sydney Council.

Transport for NSW has identified the following utilities that would potentially be impacted by the proposal:

- Electrical:
    - Electricity cable(s) on Princes Highway impacted by drainage and new pavement
    - Electricity cable(s) on Sydney Park Road impacted by new pavement
    - Electricity cable(s) on King Street impacted by new pavement
    - Electricity pole on Princes Highway impacted by new pavement
- Telecommunications:
    - Communications cable(s) on Short Street
    - Communication cable(s) on King Street impacted by drainage and new pavement
    - Communication cable(s) on Princes Highway impacted by new pavement, drainage and tree plantings
    - Communication cable(s) on Barwon Park Road impacted by new pavement

  Communication cable(s) on Sydney Park Road impacted by tree planting
- Gas:
    - Gas pipe(s) on Princes Highway impacted by new pavement
    - Gas pipe(s) on Barwon Park Road impacted by new pavement
    - Gas pipe(s) on Sydney Park Road impacted by new pavement
    - Gas pipe(s) on King Street impacted by new pavement
- Water:
    - Water pipe(s) on Princes Highway impacted by drainage and new pavement
    - Water pipe(s) on Sydney Park Road impacted by tree planting.
    - House water connection pipe on Sydney Park Road impacted by tree planting

In addition to the assets noted above, it is likely that some service covers would have to be adjusted to new pavement levels. If the design cannot be adjusted to avoid the assets noted above, consultation with the asset owners would be undertaken to determine if these assets need to be relocated or protected.

Any utility relocation requirements outside of the proposal area would be subject to further environmental assessment. Further consultation with these service providers would be carried out closer to construction.

3.6 Property acquisition

No property acquisition would be required for the proposal.

4. Statutory planning framework

4.1 Environmental Planning and Assessment Act 1979

The EP&A Act and its associated regulations provide the framework for assessing environmental impacts and determining planning approvals for developments and activities in NSW. The EP&A Act also establishes State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs) which may include provisions relevant to the proposal.

This REF has been prepared under Division 5.1 of the EP&A Act and describes the level of impact that the proposed activity may have. It aims to address Transport for NSW's duty with respect to considering the environmental impact of the proposed activity under Section 5.5 of the EP&A Act and clause 228 of the Environmental Planning and Assessment Regulation 2000.

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for a road and road infrastructure facilities and is to be carried out on behalf of Transport for NSW, it can be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (*EP&A Act). Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* (NPW Act) or land identified as a mine subsidence precinct within the meaning of the *Mine Subsidence Compensation Act 1961*. The proposal is not adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014* or within the Sydney Harbour Foreshore Area as defined by the *Sydney Harbour Foreshore Authority Act 1998*. The proposal does not affect land or development regulated by State Environmental Planning Policy (Coastal Management) 2018, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (State Significant Precincts) 2005.

Part 2 of ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by ISEPP (where applicable), is discussed in Section 5 of this REF.

State Environmental Planning Policy No. 55 – Remediation of Land

The objective of State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) is to provide a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. In accordance with Clause 7(1) of SEPP 55, a consent authority must not consent to the carrying out of any development on land unless it has considered whether the land is contaminated and whether remediation is required. SEPP 55 also requires consideration of whether the land use is suitable for the intended use.

SEPP 55 describes 'category 1 remediation work' as requiring development consent and 'category 2 remediation work' as not requiring development consent.

In SEPP 55 'remediation' is defined 'as removing, dispersing, destroying, reducing, mitigating or containing the contamination of any land, or eliminating or reducing any hazard arising from the contamination of any land (including by preventing the entry of persons or animals to the land)'. Preliminary investigations indicate the potential for contamination in the proposal area that would require excavation and off-site

disposal. The removal of surplus fill would meet the definition of remediation if the fill is contaminated, therefore SEPP 55 may apply to the proposal.

As the proposal is permissible without development consent under the Infrastructure SEPP, remediation (if required) would be classified as category 2 remediation work and would not require development consent under SEPP 55. Section 6.5 provides assessment of potential contamination impact related to the proposal and measures to mitigate the potential impact.

A *Stage 1 Contamination Assessment* carried out by Jacobs (2021) identified ten potential areas of environmental interest (AEIs) within or near to the proposal area that may present a low to high contamination risk to the proposed construction activities. The contamination assessment recommended that further contamination investigations are carried out prior to construction at areas of moderate to high risk within the proposal area. The findings from the contamination investigation and recommended environmental management measures are detailed in Section 6.5.

4.1.2 Local Environmental Plans

The proposal is located within the City of Sydney and Inner West LGAs, on land which is subject to the *Sydney Local Environmental Plan 2012* (the Sydney LEP) and the *Marrickville Local Environmental Plan 2011* (the Marrickville LEP). These Local Environmental Plans (LEPs) provide for development standards, zoning and planning controls for development in the respective LGAs. A substantial proportion of the proposal would be within the existing road corridor which is zoned SP2 Infrastructure (Classified Road), with impacts on other land use zones next to the road corridor where road works, footpath widening, shared paths, landscaping and ancillary sites would be required.

The land that would be impacted by the proposal is zoned under the Sydney LEP as:

- SP2 Infrastructure (Classified Road)
- R1 General residential
- RE1 Public recreation
- B4 Mixed Use

and zoned under the Marrickville LEP as:

- SP2 Infrastructure (Classified Road)
- B5 Business development
- RE1 Public recreation.

The land use objectives for the above mentioned land zones and the proposal's consistency with these objectives are outlined in Table 4-1.

The LEP zone provisions provide that the proposal would be permitted with consent in all affected zones. However, as outlined in Section 4.1.1 of this REF, the proposal is permitted without the consent of City of Sydney Council or Inner West Council under the ISEPP. Therefore, the consent requirements of the LEPs do not apply and the proposal may be determined under Division 5.1 of the EP&A Act.

Clause 5.10 of the Sydney LEP and the Marrickville LEP aims to conserve the environmental heritage of the LGAs and the heritage significance of heritage items. The potential impacts of the proposal on heritage items nearby are discussed in Section 6.3.

Clause 7.15 of the Sydney LEP and Clause 6.3 of the Marrickville LEP aim to minimise flood risk to life and property and requires consent authorities to consider the flood hazard of the land and the potential impact of the development on flood behaviour. The potential for the proposal to be impacted by flooding or to affect flood behaviour is discussed in Section 6.6.

Table 4-1 LEP relevant zone objectives

Zone	Objective	Consistency of the proposal with the zone objective
Sydney LEP		
SP2 Infrastructure (Classified Road)	• Provide for infrastructure and related uses • Prevent development that is not compatible with or that may detract from the provision of infrastructure.	The proposal would improve pedestrian, bicycle and road infrastructure and is consistent with the objectives for development in the SP2 Infrastructure zone.
R1 General residential	• Provide for the housing needs of the community • Provide for a variety of housing types and densities • Enable other land uses that provide facilities or services to meet the day to day needs of residents • Maintain the existing land use pattern of predominantly residential uses.	The proposal would facilitate further development in the LGA. It would improve the safety of the road network, and enable other land uses by improving access and connection to a public space (Sydney Park), a transport hub (St Peters Station) and the commercial corridor along Princes Highway and King Street.
RE1 Public Recreation	• Enable land to be used for public open space or recreational purposes • Provide a range of recreational settings and activities and compatible land uses • Protect and enhance the natural environment for recreational purposes • Provide links between open space areas • Retain and promote access by members of the public to areas in the public domain including recreation facilities and waterways and other natural features.	The proposal would have a temporary impact on open space during construction as a result of pedestrian diversions, excavations and the presence of stockpiles and ancillary facilities. Over the long term, the proposal would strengthen and improve active transport links between existing open space areas in the locality.
B4 Mixed Use	• Provide a mixture of compatible land uses • Integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling • Ensure uses support the viability of centres.	The proposal would support development in the LGA and improve pedestrian and cyclist access and urban amenity in the local area.

Zone	Objective	Consistency of the proposal with the zone objective
Marrickville LEP		
SP2 Infrastructure (Classified Road)	• Provide for infrastructure and related uses • Prevent development that is not compatible with or that may detract from the provision of infrastructure • To protect and provide for land used for community purposes.	The proposal would improve pedestrian, bicycle and road infrastructure and is consistent with the objectives for development in the SP2 Infrastructure zone.
B5 Business Development	• Enable a mix of business and warehouse uses, and specialised retail premises that require a large floor area, in locations that are close to, and that support the viability of, centres • Enable a purpose built dwelling house to be used in certain circumstances as a dwelling house • Support urban renewal and a pattern of land use and density that reflects the existing and future capacity of the transport network.	The proposal would support urban renewal by improving urban amenity and encouraging the use of active modes of transport which would reduce existing and predicted road congestion.
RE1 Public Recreation	• Enable land to be used for public open space or recreational purposes • Provide a range of recreational settings and activities and compatible land uses • Protect and enhance the natural environment for recreational purposes • Provide for a range of community facilities, services and compatible land uses	The proposal would have a temporary impact on open space during construction as a result of pedestrian diversions and landscaping works. Over the long term, the proposal would strengthen and improve active transport links between existing open space areas in the locality.

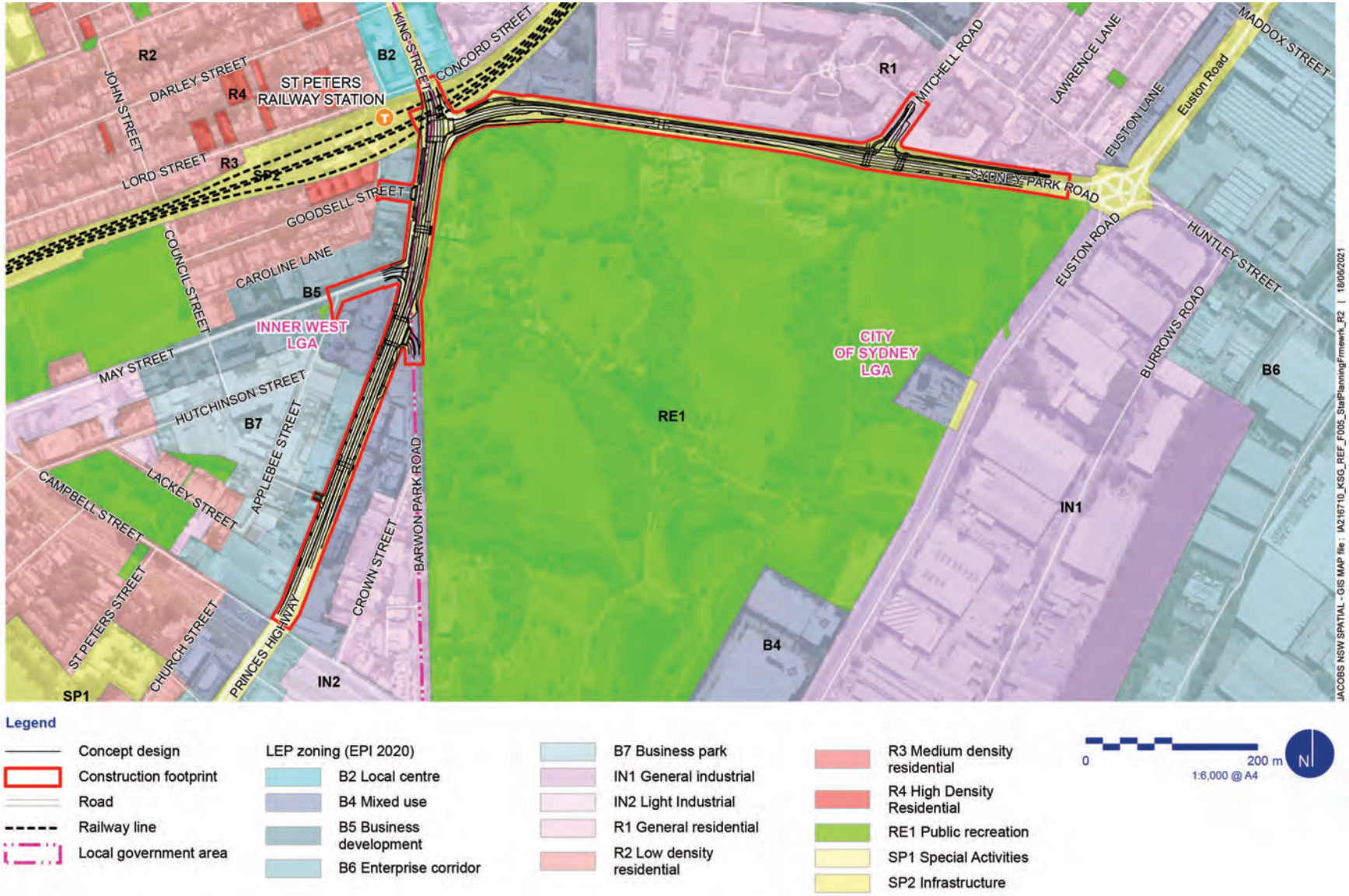

Figure 4-1 Sydney and Marrickville LEP Zoning

4.2 Other relevant NSW legislation

4.2.1 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) provides the legal framework for the management of air, noise, water and waste pollution. Under Part 3.2 of the POEO Act, the carrying out of scheduled development work as defined in Schedule 1 – road construction (meaning the construction, widening, or re-routing of roads) is relevant to the proposal.

Schedule 1 lists scheduled activities, including road construction on classified roads. The scheduled activities set out in Schedule 1 that are most relevant to the proposal include:

- Dealing with certain types of waste. For road construction associated with widening or rerouting of existing roads, if the activities result in the existence or four or more traffic lanes for at least one kilometre in the metropolitan area and the road is classified or proposed to be classified as a freeway or tollway, a licence would be required if more than 50,000 tonnes of materials are extracted or processed (Clause 35).

Based on the concept design and construction methodologies proposed (refer to Section 3.3) an Environment Protection Licence (EPL) would not be required for the proposal. This would be confirmed during detailed design.

4.2.2 Contaminated Land Management Act 1997

The *Contaminated Land Management Act 1997* (CLM Act) establishes a process for investigating and, where appropriate, remediating land that the NSW Environment Protection Authority (EPA) has reason to believe is significantly contaminated so as to warrant regulation under the CLM Act. The CLM Act allows the EPA to declare land as significantly contaminated land and to order a public authority to carry out actions or prepare a plan of management for such land.

Under Section 60 of the CLM Act, a person whose activities have contaminated land or an owner of land whose land has been contaminated (whether before or during the ownership of the land) above certain levels (as outlined in the *Guidelines on the Duty to Report Contamination*, EPA 2015), is required to notify the EPA in writing as soon as they become aware of the contamination. Excess spoil that cannot be used on site would be classified in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014) to determine licensing, waste tracking and disposal requirements. Should any contaminated soil be encountered during construction, protocols to deal with the management of potential contamination and unexpected contamination finds would be implemented.

4.2.3 Roads Act 1993

The *Roads Act 1993* (Roads Act) provides for the operation, maintenance and use of roadways in NSW including managing authorities, rites of passage and classification of roads.

Section 138 of the Roads Act requires that a person must not carry out work in, on or over a public road or dig up or disturb the surface of a public road without the prior consent of the appropriate roads authority. Clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads.

The proposal requires construction work on the Princes Highway, which is a classified road (the whole proposal is classified) within the Inner West and City of Sydney LGAs, and temporary interruption to traffic along the proposal. Transport for NSW is the proponent and the relevant roads authority for the proposal.

4.2.4 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) provides a number of mechanisms by which items and places of heritage significance may be protected. The Heritage Act is designed to protect both listed heritage items, such as standing structures and potential archaeological remains or relics.

The Heritage Council of NSW maintains the State Heritage Register (SHR) which controls activities such as alteration, damage, demolition and development. Applications under Section 60 of the Heritage Act must be made to the Heritage Council of NSW for any major work which could impact an item listed on the SHR.

A Statement of Heritage Impact (SoHI) was completed for the proposal. The SoHI found that there are four heritage listed items and two unlisted potential heritage items within the proposal area and a further five listed heritage items next to the proposal (refer to Section 6.3). One of the listed heritage items, the St Peters Railway Station Group, is listed on the NSW State Heritage Register.

The proposal would not involve direct impacts to the St Peters Railway Station Group. With the implementation of safeguards and management measures listed in Section 6.3.5, the risk of any unintended impacts from nearby construction activities nearby is considered to be negligible. A Section 57 Exemption Notification would be submitted to the Heritage Council of NSW for approval prior to construction of the proposal.

Section 139 of the Heritage Act also requires any person who knows or has reasonable cause to suspect that their proposed works will expose or disturb an archaeological 'relic' to first obtain an Excavation Permit from the Heritage Council of NSW (pursuant to Section 140), unless there is an applicable exception (pursuant to Section 139(4)).

There are three areas of historical archaeological potential that have been identified within the proposal area. One of these areas of archaeological potential are related to former tramlines and tram tracks along King Street/Princes Highway and Sydney Park Road. According to Transport for NSW's *Standard Management Procedure: Unexpected Heritage Items* (Roads and Maritime Services, 2015), the tramlines and tram tracks are considered to be 'works' rather than 'relics'. The exposure of a 'work' does not trigger reporting obligations under the Heritage Act.

The other two areas of archaeological potential are associated with the Former Brickworks Group local heritage item (located to the southeast of the intersection of King Street and Sydney Park Road) and are beneath the footpath and adjacent roadway on King Street and Sydney Park Road outside the heritage boundary.

For works within the footpath area of archaeological potential that involves subsurface disturbances or excavations deeper than 200 millimetres, an Excavation Permit under Section 140 of the Heritage Act would be sought from the Heritage Division, DPIE, as delegate of the NSW Heritage Council, prior to construction, to allow disturbance and/or removal of archaeological relics. Archaeological monitoring would also be undertaken by an appropriately qualified historical archaeologist during ground disturbance works within the footpath area of archaeological potential.

For any ground disturbance works within the roadway area of archaeological potential, an appropriately qualified historical archaeologist would be on call during these works in the advent that any unexpected historical archaeological sites are found. The *Transport for NSW Standard Management Procedure: Unexpected Heritage Items* (Roads and Maritime, 2015) would be implemented in the event that any unexpected archaeological relics are found.

Although an excavation permit is not required for the tramways area of archaeological potential under the Heritage Act, archaeological monitoring would also be undertaken during ground disturbance works within this area of archaeological potential.

If any item or material is uncovered during construction of the proposal that has potential heritage value or significance, Transport for NSW would follow an established unexpected finds procedure. Under this procedure, all work at the location of the find would cease until the item or material can be investigated by a suitably qualified person, to establish whether the item or material is of heritage significance, and whether any further actions are warranted for its removal and/or protection.

4.2.5 National Parks and Wildlife Act 1974

The NPW Act is the primary legislation dealing with Aboriginal cultural heritage in NSW. Items of Aboriginal cultural heritage (Aboriginal objects) or Aboriginal places (declared under section 84) are protected and regulated under the NPW Act. Aboriginal objects are protected under section 86 of the Act. Under section 90(1) of the Act the Director-General may issue an Aboriginal Heritage Impact Permit (AHIP) for an activity which would harm an Aboriginal object.

An assessment of the potential impacts on Aboriginal cultural heritage provided in Section 6.4, notes that no previously recorded items under the Aboriginal Heritage Information Management system (AHIMS) are located within the proposal area. The assessment also concluded that the proposal area is of very low to low archaeological potential due to previous disturbances associated with historical road formation and local developments.

4.2.6 Biodiversity Conservation Act 2016

The BC Act seeks to conserve biological diversity and promote ecologically sustainable development (ESD); to prevent extinction and promote recovery of threatened species, populations and ecological communities; and to protect areas of outstanding biodiversity value. The BC Act provides a listing of threatened species, populations and ecological communities, areas of outstanding biodiversity value, and key threatening processes.

Part 7 of the BC Act requires that the significance of the impact on threatened species, populations and endangered ecological communities listed under the BC Act or FM Act, are assessed using a five-part test. Where a significant impact is likely to occur, a Species Impact Statement or Biodiversity Development Assessment Report must be prepared in accordance with the Secretary's requirements.

In September 2015, a "strategic assessment" approval was granted by the Federal Minister in accordance with the EPBC Act. The approval applies to Transport for NSW activities being assessed under Division 5.1 of the EP&A Act with respect to potential impacts on nationally listed threatened species, ecological communities and migratory species.

As a result, Transport for NSW proposals assessed via a REF:

- Must address and consider potential impacts on nationally listed threatened species, populations, ecological communities and migratory species, including application of the "avoid, minimise, mitigate and offset" hierarchy
- Do not require referral to the Federal Department of the Environment for these matters, even if the activity is likely to have a significant impact
- Must consider impacts to nationally listed threatened species, ecological communities and migratory species as part of the approval process under the strategic assessment. To assist with this, assessments are required in accordance with the *Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999* (Department of Environment, 2013).

The biodiversity assessment (refer to Section 6.7) concluded that the proposal would not have a significant impact on threatened species or ecological communities or critical habitat and therefore a Species Impact Statement or Biodiversity Development Assessment Report has not been prepared.

4.2.7 Water Management Act 2000

The *Water Management Act 2000* (Water Management Act) provides for the protection of waterfront land and the sustainable management of water resources in NSW by controlling the extraction of water, the use of water, the construction of infrastructure such as dams and weirs, and any activities in or near water sources in NSW. The Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011 (Cooks River and Botany Bay Management Zone), apply to the proposal.

Licensing

Section 56 of the Water Management Act establishes access licences for the taking of water within a particular water management area. Under clause 21(1) of the Water Management (General) Regulation 2018, Transport for NSW, as a roads authority, is exempt from the need to obtain an access licence in relation to water required for road construction and road maintenance.

Activity approvals under Section 91 of the Water Management Act are required when a certain activity is likely to affect waterfront land or interfere with an aquifer. The proposal is not expected to impact on groundwater from geotechnical investigations. However, clause 41 of the Water Management (General) Regulation 2018 provides that Transport for NSW, as a roads authority, is exempt from requiring controlled activity approval for all controlled activities that it carries out in, on or under waterfront land.

Aquifer interference policy

In September 2012, the NSW Government released the *Aquifer Interference Policy* which aims to protect groundwater aquifers while balancing different water uses.

Under Section 91(F) of the Water Management Act, approval is required for aquifer interference activities, which include the penetration of an aquifer, interference with water in an aquifer, the obstruction of the flow of water in an aquifer, the taking of water from an aquifer in the course of carrying out any activity prescribed by the Water Management (General) Regulation 2018, and the disposal of water taken from an aquifer.

Clause 34 and Schedule 4 of the Water Management (General) Regulation 2018 provides an exemption for the taking of groundwater during geotechnical investigations and excavations required for the construction of a road or other infrastructure, as long as the maximum volume of groundwater taken does not exceed three megalitres per year. The proposal is not anticipated to reduce the groundwater resource pool by three mega litres per year and therefore aquifer interference approval is not required.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Appendix A and Section 6 of the REF.

A referral is not required for proposed road activities that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of Section 6 of the REF and Appendix A.

Findings – matters of national environmental significance

The assessment of the proposal's impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the proposal has not been referred to the Australian Government Department of the Environment and Energy under the EPBC Act.

Findings – nationally listed biodiversity matters (where the strategic assessment applies)

The assessment of the proposal's impact on nationally listed threatened species, endangered ecological communities and migratory species found that there is unlikely to be a significant impact on relevant

matters of national environmental significance. Section 6 of the REF describes the safeguards and management measures to be applied.

4.3.2 Native Title Act 1993

The *Native Title Act 1993* (Native Title Act) recognises and protects native title. The Act covers actions affecting native title and the processes for determining whether native title exists and compensation for actions affective native title. It establishes the Native Title Registrar, the National Native Title Tribunal, the Register of Native Title Claims and the Register of Indigenous Land Use Agreements, and the National Native Title Register. Under the Act a future act includes proposed public infrastructure on land or waters that affects native title rights or interest.

A search of the Native Title Tribunal Native Title Vision website was undertaken, and no Native Title holders or claimants identified.

4.4 Confirmation of statutory position

The proposal is categorised as development for the purpose of a road and road infrastructure facilities and is being carried out by or on behalf of a public authority. Under clause 94 of ISEPP the proposal is permissible without consent. The proposal is not State significant infrastructure or State significant development. The proposal can be assessed under Division 5.1 of the EP&A Act.

Transport for NSW is the determining authority for the proposal. This REF fulfils Transport for NSW's obligation under Section 5.5 of the EP&A Act including to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

5. Consultation

5.1 Consultation strategy

A Communication and Stakeholder Engagement Plan (CSEP) has been prepared by Transport for NSW to outline the communication and engagement process for the consultation on the REF. Communication and engagement objectives of the CSEP include:

- Educate stakeholders and community about the REF (including objectives, impacts and benefits)
- Encourage stakeholders and community to take part in the engagement and have their say on the REF
- Promptly manage and resolve community and stakeholder enquiries
- Create transparent and quality information and promptly deliver it
- Report back to stakeholders and community on engagement outcomes.

The communication and engagement approach is to ensure that stakeholders, community, pedestrians, cyclists and road users understand the benefits and impacts of the project and are aware of the ways they can provide their input.

5.1.1 Stakeholders

The key stakeholders identified as part of the CSEP included:

- Federal Government: Members for Grayndler and Sydney
- NSW Government: Minister for Transport and Roads, Minister for Planning and Public Spaces and Members of Parliament for Heffron and Newtown
- Local Government: City of Sydney Council and Inner West Council
- Transport operators:
    - Buses – State Transit
    - Heavy Vehicle Industry Australia / Transport for NSW freight
- Ride-share industry
- Government agencies
- NSW Police
- Sydney Park and businesses within Sydney Park
- Other:
    - Freight companies
    - Utilities (major telecoms, power and water utilities in the area)
    - Residents and businesses impacted by the project
    - Schools, churches
    - Pedestrians, cyclists
    - Road users
    - Community, interest and environmental groups
    - Media

5.1.2 Consultation

During the REF consultation, stakeholders and the community would have the opportunity to provide their feedback through an online interactive portal, by phone, email and post.

Due to some COVID-19 social distancing restrictions, a wide variety of communication tools would be used in an effort to reach as many people as possible.

The following communication and engagement methods would be used throughout the consultation but may need to be updated to suit any changing COVID-19 circumstances and rules around social distancing:

- Project information phone line
- Project email address
- Project webpage
- Phone/ video briefings
- Online interactive portal
- Online questionnaire (post REF consultation)
- Letterbox drop
    - Brochure / community update
    - Work notifications
    - Letter
    - Post card
- Direct phone call (businesses, in lieu of door knock)
- Pole/ bollard signage
- VMS
- Social media advertising
- Online info session / webinar
- Stakeholder communication channels (leverage our stakeholder's existing channels and methods such as e-newsletters, social media, apps etc.)
- Media holding lines and media release.

All communication with stakeholders would be documented.

The following sections outline the consultation that has been carried out specifically for the proposal.

5.2 Community involvement

Stakeholders near the proposal received notification for site investigations work that occurred at the end of 2019, in August 2020 and in May 2021. For more information about ongoing and future consultation with the community refer to Section 5.6.

5.3 Aboriginal community involvement

Transport for NSW is committed to effective consultation with Aboriginal communities about its activities and the potential for impact on Aboriginal cultural heritage. All Aboriginal community involvement in Transport for NSW proposals is governed by the provisions of the Transport for NSW *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI), relevant legislation and guidelines.

PACHCI provides a consistent means of effective consultation with Aboriginal stakeholders regarding activities which may impact on Aboriginal Cultural Heritage and is consistent with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW, 2010). A summary of the four stages of the PACHCI procedure is provided in Table 5-1, and the activities which have been undertaken for the proposal.

Table 5-1 Summary of PACHCI procedure

Stage	Description
Stage 1	Initial desktop assessment to identify whether the proposal is likely to harm Aboriginal cultural heritage, and whether further assessment or investigation is required.
Stage 2	Further assessment and site survey with Aboriginal stakeholders to assess a project's potential to harm Aboriginal cultural heritage and to identify whether formal Aboriginal community consultation and an Aboriginal Cultural Heritage Assessment Report (ACHAR) is required.
Stage 3	Where Stages 1 and 2 have led to the preliminary view that harm to Aboriginal objects or places will occur or is likely to occur, formal consultation and preparation of an ACHAR must be completed. This stage may also involve archaeological test excavations.
Stage 4	Implementation of safeguards and management measures.

A search of the Aboriginal Heritage Information Management System (AHIMS) database undertaken on 24 May 2021 did not identify any registered Aboriginal sites, objects or places within 200 metres of the proposal area. The proposed work would be carried out in a highly modified and disturbed road corridor that is considered to have low potential to contain indigenous artefacts. The Stage 1 PACHCI assessment (refer to Section 6.4) has concluded that the proposal is unlikely to affect Aboriginal cultural heritage. The Stage 1 PACHCI assessment is provided in Appendix L.

5.4 ISEPP consultation

Clauses 13 to 16 of the ISEPP contain provisions for public authorities to consult with local councils and other public authorities when proposing to carry out certain types of development. Consultation is required in relation to specified development or development that impacts on:

- Council related infrastructure or services (clause 13)
- Local heritage (clause 14)
- Flood liable land (clause 15)
- Public authorities other than councils (clause 16).

Appendix B contains an ISEPP consultation checklist that documents how ISEPP consultation requirements have been considered.

As the proposal has the potential to impact on the local road network and local heritage items, consultation in accordance with ISEPP was carried out with Inner West Council and City of Sydney Council. Letters were sent out on 5 May 2021 for the ultimate concept design. A letter was also sent to the NSW State Emergency Services (NSW SES) on 5 May 2021, due to the proposal being located on flood liable land (clause 15AA). The letters provided information on the proposal and requested input in terms of any issues or concerns.

A copy of the letters sent, and the response received are provided in Appendix B.

Issues that have been raised as a result of this consultation are outlined below in Table 5-2.

Table 5-2 Issues raised through ISEPP consultation

Agency	Issue raised	Response/where addressed in REF
City of Sydney Council	See Table 5-3	See Table 5-3
Inner West Council	See Table 5-3	See Table 5-3
SES	No issues	-

5.5 Government agency and stakeholder involvement

Transport for NSW has consulted with City of Sydney Council and Inner West Council and other key stakeholders on an ongoing basis during the design development process. Issues that have been raised as a result of consultation with the councils and other key stakeholders are outlined below in Table 5-3 and have been considered in the design.

Table 5-3 Issues raised through stakeholder consultation

Agency	Issue raised	Response/where addressed in REF
Inner West Council	• Urban design and landscape outcomes along King Street and Princess Highway and around St Peters Station • Pedestrian access into and around St Peters Station • Integration of the proposed active transport corridor with existing and future cycling networks • Retain stone kerbs and gutters in-situ	Refer to Landscape character and visual amenity (Section 6.8) Refer to Traffic and transport (Section 6.1) Refer to Non-Aboriginal heritage chapter (Section 6.3)
Transport for NSW	• Relocation of bus stop along Sydney Park Road • Integration into the wider road network and future transport planning strategies • Rerouting of heavy freight once restrictions are in place along King Street/Princess Highway and Sydney Park Road.	Refer to Traffic and transport (Section 6.1)
Sydney Trains	• Proposed changes to rail overbridge over existing rail corridor.	Ongoing consultation during proposal development
Department of Planning, Industry and Environment	• Proposal briefing provided, no specific issues raised.	Ongoing consultation during proposal development
City of Sydney	• Intersection layout at the Mitchell / Sydney Park Road and King Street / Sydney Park Road intersections • Tie in arrangement at Euston Road • Integration of the proposed 'on road' active transport corridor to existing and future cycling network • Pedestrian access and facilitation into Sydney Park and surrounds • Urban design and landscape outcomes along Sydney Park Road and at King Street / Sydney Park Road intersection • Operational requirements associated with Sydney Park • Implementing appropriate mitigation and management measures to retain heritage items within the City of Sydney LGA.	Refer to Traffic and transport (Section 6.1) Refer to Landscape character and visual amenity (Section 6.8) Refer to Non-Aboriginal heritage chapter (Section 6.3)

5.6 Ongoing or future consultation

This REF would be placed on public exhibition for stakeholder and community comment. All comments received would be considered when finalising the proposal design. The community would be kept informed of any further changes to the proposal resulting from this and any future consultation process.

Following public display of the REF, all submissions received would be recorded and addressed in a Submissions Report detailing how each issue raised would be considered in finalising the proposal design. The Submissions Report would be made available to the public on the proposal webpage on the Transport for NSW website.

The following consultation would be ongoing:

- Current proposal information would be provided through the Transport for NSW project website
- Meetings with City of Sydney Council, Inner West Council, utility providers and other government agencies
- Updates to the immediately affected community during the detailed design phase and construction phases
- Consultation with community stakeholders to help manage impacts during construction
- Follow-up meetings to discuss and agree access arrangements with directly affected landowners prior to and during construction
- Media releases and project advertisements in local media
- Should the proposal proceed, the construction contractor would develop a Community and Stakeholder Involvement Plan to keep residents and road users up to date about construction progress. This would include:
    - Notifying residents when work is proposed to start
    - Notifying residents of night work
    - Notifying residents of access issues

6. Environmental assessment

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment potentially impacted upon by the proposal are considered. This includes consideration of:

- Potential impacts on matters of national environmental significance under the EPBC Act
- The factors specified in the guidelines Is an EIS required? (DUAP, 1995/1996) as required under clause 228(1) *of the* Environmental Planning and Assessment Regulation 2000 and the *Roads and Related Facilities EIS Guideline* (DUAP, 1996). The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix A.

Site-specific safeguards and management measures are provided to mitigate the identified potential impacts.

6.1 Traffic and transport

The existing traffic and transport environment and the potential impacts of the proposal on traffic and transport are assessed in the *Sydney Park Junction Transport and Traffic Assessment* (Jacobs, 2021) provided in Appendix C. This section provides a summary of the assessment and recommends safeguards and management measures to reduce the potential impacts of the proposal. This assessment was conducted using 2019 data as baseline data as opposed to 2021 data which includes implemented upgrades to Euston and Campbell Road, making this a conservative approach to the assessment of potential traffic impacts.

6.1.1 Methodology

The methodology used to assess the impact of the proposal on the transport network combines the traditional traffic engineering and traffic modelling approach to road network project development and assessment with the movement and place approach to road corridor planning and management that recognises the various functions of the road network.

The methodology included:

- A review of the existing transport network, including a description of transport infrastructure in the study area, public transport service provision, pedestrian and cycle networks and infrastructure, and traffic volumes and patterns
- Analysis of historic crash data to understand current crash rates and trends in the traffic study area
- Analysis of existing parking and access provisions and comparing with parking and access provisions during construction and operation of the proposal
- Traffic modelling of existing and forecast traffic scenarios at 2019, 2023 and 2033 to evaluate impacts
- Assessment of the potential transport and traffic impacts of the proposal on pedestrians, cyclists, public transport, private vehicles, freight, road safety and the surrounding built environment during construction and operation, including consideration of cumulative impacts
- The identification of measures to mitigate and manage the identified transport and traffic impacts.

The following strategies and guidelines were considered in the assessment:

- *Future Transport Strategy 2056* (TfNSW, 2018)
- *Practitioner's Guide to Movement and Place* (DPIE, 2020)
- *Traffic Modelling Guidelines* (Roads and Maritime Services, 2013)

- *Guide to Traffic Generating Developments* (Roads and Traffic Authority, 2002).

Movement and place

The road network has many functions; it not only supports the movement people, goods and services, it also provides access to places that support a range of activities. In recognition of these various functions, the *Practitioner's Guide to Movement and Place* outlines the following aims for roads:

- Balance movement within, to and from, and through places
- Make safer environments
- Improve the amenity of places
- Support the needs of all users
- Use space efficiently
- Support the economy by enabling the movement of goods
- Support sustainable development.

The *Practitioner's Guide to Movement and Place* proposes five built environment themes and ten user outcomes that provides a framework for evaluating the movement and place performance of roads, as outlined in Table 6-1 and shown in Figure 6-1.

Table 6-1 Built environment themes and user outcomes

Built environment theme	Description	User outcomes
Access and connection	Well-connected places enable urban mobility through access to opportunity, services, and amenities at local, district, metropolitan, and regional levels. Walkable neighbourhoods, cycle routes, and public transport support equitable and accessible movement around and between places.	• Mode choice • Reliable transport • Equity (of access)
Amenity and Use	Places for people provide a diversity of public and private spaces to accommodate a variety of activities at different times of day and night, as well as essential and community services. Quality public space is a key component.	• Convenient facilities • Local opportunities
Green and Blue	Trees, landscapes, and water are critical infrastructure for greening and cooling our urban and regional places in sustainable ways. As a network they can improve people's comfort and experience of the built environment (e.g. providing shade and connections with nature), and its functional performance (e.g. mitigating flooding), including providing open space for recreation and respite.	• A link to nature
Comfort and Safety	Clear air, sun, shade, peaceful parks, and active building frontages contribute to the liveability of places through environmental comfort including feelings of safety. Road and street environments can cater for all users, without risk of death or serious injury.	• Comfortable environment • Low risk
Character and Form	The identity of a place is perceived through its built form, landscape character, and the contributions of local people over time. Culture and histories, including Aboriginal culture and heritage, shape our everyday environments. The character of each place is different, and an authentic response to that character can contribute to the success of that place.	• Human-scaled • Distinct features

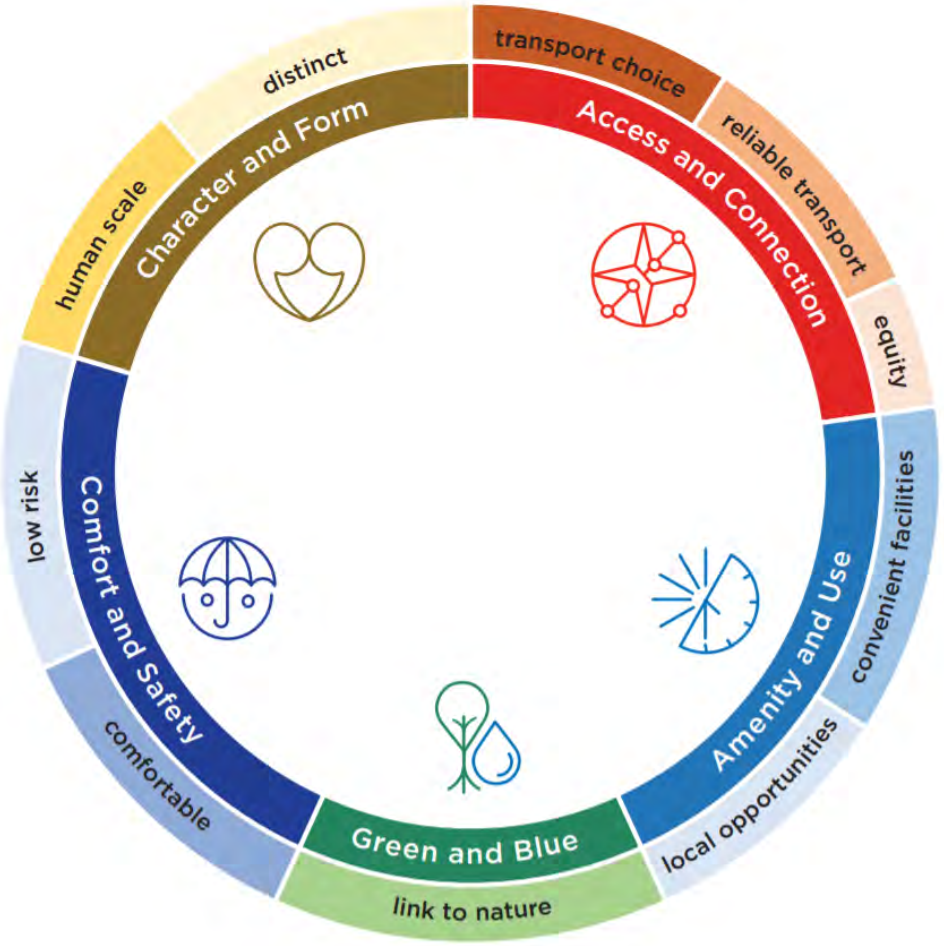

Figure 6-1 Built environment themes and user outcomes (DPIE, 2020)

Road performance indicators

The performance indicators for roads recognise the various functions of the road network and reflect the needs of each road customer group. The performance indicators are both quantitative and qualitative and are described in Table 6-2.

Table 6-2 Performance indicators

Customer group	Performance indicators
General traffic and freight	• Intersection performance (determined through traffic modelling) • On-street parking and freight loading provision
Bus	• Intersection performance (determined through traffic modelling) • Bus stop facilities
Pedestrians	• Walking comfort and accessibility • Pedestrian facilities • Crossing opportunities • Pedestrian environment and security
Cyclists	• Cycle connectivity and flow • Cycling facilities • Cycling difficulty • Cycle parking facilities

Traffic modelling

Traffic modelling for the traffic and transport assessment was undertaken in accordance with the *Traffic Modelling Guidelines* (Roads and Maritime Services, 2013) and included:

- Development of calibrated and validated base models to align with existing operational conditions in base year 2019
- Development of future year base models to align with anticipated operational conditions in the assumed year of opening (2023) and ten years after opening (2033)
- Application of road network changes associated with the proposal to the future year base models to allow the identification of potential impacts to road network performance.

Models were developed using the microsimulation traffic modelling software package VISSIM.

Traffic modelling was undertaken for the weekday morning (7am to 9am) and evening (4pm to 6pm) peak periods only, which is consistent with the standard approach for this type of assessment. The peak traffic periods represent a worst-case scenario, as during these periods the road network experiences the maximum background traffic demand and the available spare capacity of the road network is at its most limited. A review of Saturday traffic volumes compared to weekday traffic volumes indicates that weekday peak hour traffic volumes are higher than Saturday peak hour traffic volumes. Hence, a quantitative assessment on Saturdays has not been undertaken.

A summary of traffic modelling scenarios that were adopted to determine the impacts of the proposal on road network performance is provided in Table 6-3.

Table 6-3 Traffic modelling scenarios

Model year	Without proposal	With proposal	Modelling scenario	Description	Impacts assessed
2019	✓		Existing	The existing road network	N/A
2023	✓		Year of opening without the proposal	The road network with background traffic growth	Performance of the road network at the year of opening without the proposal
2023		✓	Year of opening with the proposal	The road network with background traffic growth and operation of the proposal	Operational impacts on the road network as a result of the proposal
2033	✓		Year of opening + 10 years without the proposal	The road network with background traffic growth	Performance of the road network at ten years after opening without the proposal
2033		✓	Year of opening + 10 years with the proposal	The road network with background traffic growth and operation of the proposal	Operational impacts on the road network as a result of the project

Intersection performance indicators

The performance of a road network is largely dependent on the operating performance of intersections, which form critical capacity control points. The performance indicators that are reported for this assessment include:

- Intersection Level of Service (LoS) – based on criteria outlined in Table 6-4 and defined in the *Guide to Traffic Generating Developments* (Roads and Traffic Authority, 2002). These are ranked from LoS 'A' representing the best performance to LoS 'F' representing the worst
- Maximum queue length on each approach (in metres) of the intersection over the assessed hour.

The LoS measure was applied to the current performance of the intersections (2019) as well as the forecast performance of the intersections for future years (2021 and 2031) based on an assessment of performance without the proposal and with the proposal in operation.

Table 6-4 Intersection level of service criteria

LoS	Average delay per vehicle (seconds/vehicle)	Traffic signals and roundabouts
A	Less than 15	Good operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity; at signals, incidents will cause delays Roundabouts require other control mode
F	Over 70	Extra capacity required

6.1.2 Existing environment

Pedestrian and cycling network

Cycling and pedestrian infrastructure in the study area are described in Section 2.3 and shown in Figure 2-4.

Public transport network

Train and bus services in the study area are described in Section 2.3.1and shown in Figure 2-5.

Road network

An overview of the road network within and surrounding the proposal area is provided in Section 2.2.1. Further discussion on traffic volumes and patterns, intersection performance and the function and significance of key roads within the proposal area is provided below.

Traffic volumes and patterns

Traffic volume counts, undertaken in 2019 before the opening of the M8 Motorway (Stage 1), indicate that Princes Highway carries a high volume of traffic. During the weekday morning peak hour, the peak direction is northbound with volumes of up to 1,860 vehicles per hour in each direction near the proposal. During the weekday evening peak hour, the peak direction is southbound with volumes of up to 2,090 vehicles per hour in each direction.

Sydney Park Road also carries a high volume of traffic ranging from 580 to 1,970 vehicles in each direction during the weekday morning and evening peak hours. Sydney Park Road exhibits a distinct eastbound morning peak direction and westbound evening peak direction due to traffic travelling to and from industrial and employment areas to the east.

King Street carries 700 to 1,000 vehicles in each direction during the weekday morning and evening peak hours. King Street does not exhibit a defined peak direction and vehicle volumes are approximately equal during both peak hours.

Mitchell Road carries between 240 and 730 vehicles in each direction with a northbound peak direction during the weekday morning and evening peak hours.

Prior to the opening of the M8 Motorway (Stage 1), Campbell Street/Campbell Road carried between 340 to 670 vehicles in each direction during the peak hours and exhibited an eastbound peak direction during the morning peak period and a westbound peak direction during the evening peak period.

Prior to the opening of the M8 Motorway (Stage 1), Euston Road carried low volumes of vehicles (up to 140 vehicles in each direction during the peak hours).

It is important to note that 2019 data was used for this assessment instead of 2021 data, which includes implemented upgrades to Euston and Campbell Road, and this assessment is considered more conservative.

Approximate peak hour midblock volumes on key access roads are shown in Figure 6-2.

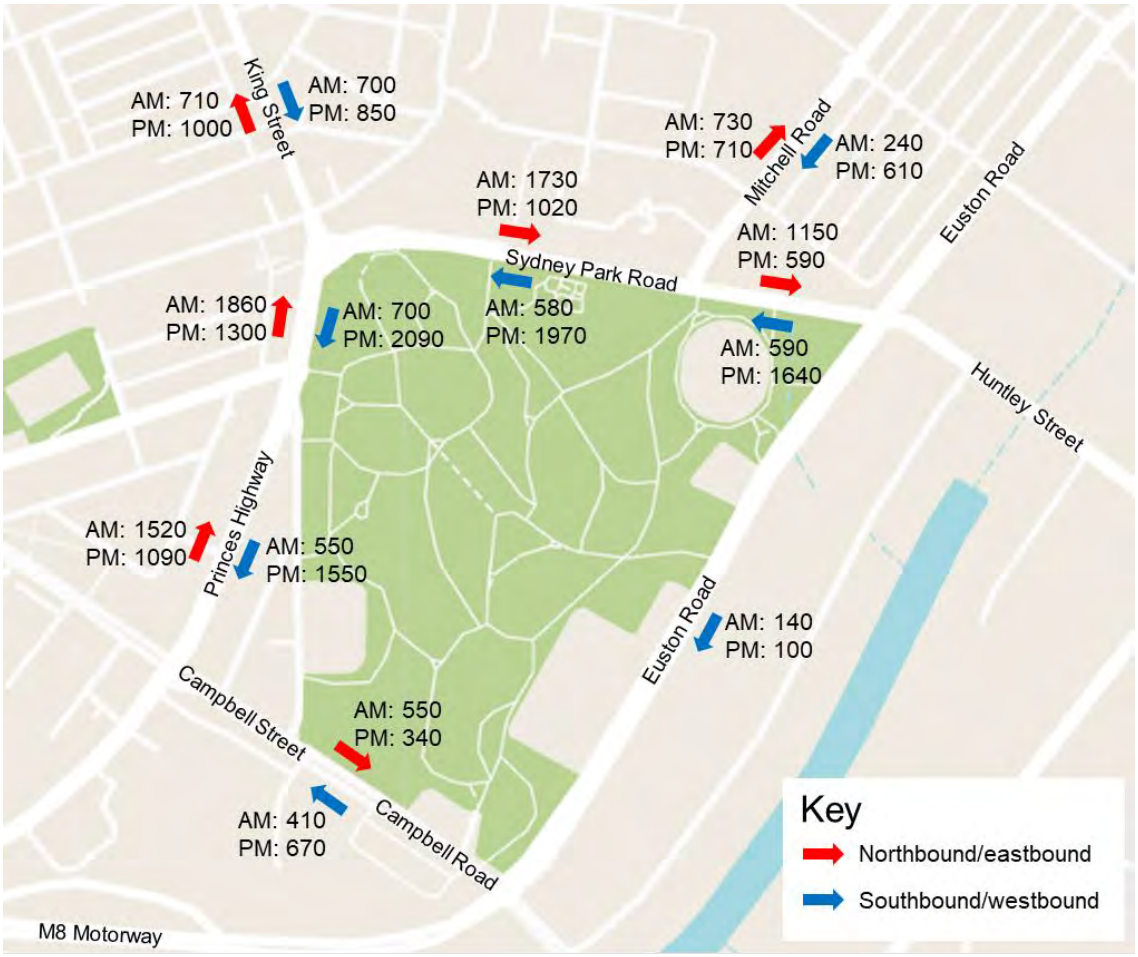

Figure 6-2 Existing peak hour traffic volumes by direction (2019)

Intersection performance

Modelled performance of key intersections during the weekday morning and evening peak hours in the vicinity of the proposal is shown in Table 6-5. The results indicate that the following intersections currently perform at LoS F at the following time periods:

- Princes Highway / May Street during the weekday morning peak hour. This is due to northbound congestion downstream at the King Street / Sydney Park Road intersection where there are high volumes of through traffic conflicting with right-turning and cross-street traffic.
- Euston Road / Huntley Street / Sydney Park Road during the weekday morning peak hour. This is due to high volumes of conflicting traffic from the southbound and westbound approaches.
- Mitchell Road / Sydney Park Road during the weekday morning peak hour. This is due to high volumes of east-west traffic on Sydney Park Road.

Table 6-5 Modelled peak hour existing intersection performance (2019)

Intersection and peak hour	Intersection throughput (vehicles per hour)	Average delay (seconds per vehicle)	Level of Service (LoS)
King Street / Sydney Park Road			
Morning	3140	44	D
Evening	4120	38	C
Princes Highway / May Street			
Morning	2710	88	F
Evening	3560	23	B
Princes Highway / Campbell Street			
Morning	2590	41	C
Evening	3240	15	B
Euston Road / Huntley Street / Sydney Park Road			
Morning	2010	77	F
Evening	2410	30	C
Mitchell Road / Sydney Park Road			
Morning	2470	105	F
Evening	3270	31	C
Euston Road / Campbell Road			
Morning	620	4	A
Evening	590	2	A

Function and significance of key roads

The function and significance of key roads in the study area are described below.

Princes Highway

Princes Highway is a state road that provides north-south connectivity to major east-west corridors including Sydney Park Road, Canal Road, Railway Road and the M8 Motorway (Stage 1). The road:

- is classified as a secondary freight route and permits the carriage of 25/26 metre B-Double heavy vehicles as part of the general mass limit (GML) and higher mass limit (HML) network. It provides connectivity for freight movements between industrial areas at St Peters, Sydenham and Tempe, and the wider arterial road and motorway networks
- facilitates city-serving and centre-serving bus services that provide public transport access to nearby residential and employment areas, the wider public transport network including St Peters Station, key centres (such as Green Square, Mascot, Kogarah, Randwick and Newtown) and the Sydney CBD
- has limited active frontages along the road. The adjoining land uses include medium-density residential, retail and industrial land uses to the south, west and north and recreational land uses to the north-east. Redevelopment of industrial land to mixed use (retail and residential) developments are currently underway along Princes Highway

- provides access to key walking and cycling destinations including nearby public transport interchanges and recreational areas. Pedestrian and cyclist activity is primarily concentrated at the northern end of Princes Highway near St Peters Station and the entrances to Sydney Park.

Sydney Park Road

Sydney Park Road is a state road that is part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. The road:

- is classified as a secondary freight route and permits 25/26 metre B-Double heavy vehicles as part of the GML and HML network. The road provides connectivity for freight movements between industrial areas at St Peters, Alexandria and Beaconsfield, and the wider arterial road network
- facilitates city-serving and centre-serving bus services that provide public transport access to nearby residential and employment areas, the wider public transport network, key centres and the Sydney CBD
- has limited active frontages along the road. The adjoining land uses include medium-density residential land uses to the north and recreational land uses to the south
- provides access to key walking and cycling destinations including nearby public transport interchanges and recreational areas. It also provides connectivity to the wider regional cycle network for access to the Sydney CBD, Redfern, Green Square, Sydney Airport and the Inner West. Pedestrian and cyclist activity is primarily concentrated at the western end near St Peters Station and along the northern frontage of Sydney Park.

King Street

King Street is a state road that provides north-south connectivity to City Road, Enmore Road and Princes Highway through the Newtown activity precinct. The road:

- is classified as a tertiary freight route, but does not permit 19 metre B-Double heavy vehicles and is not part of the GML and HML networks. The road facilitates last-mile connectivity for light freight movements travelling to and from the wider freight network
- facilitates city-serving and centre-serving bus services that provide public transport access to nearby residential and retail areas, the wider public transport network including St Peters Station, key centres (such as Green Square, Mascot, Kogarah, Randwick and Newtown) and the Sydney CBD
- has high levels of street activation (commercial and retail activity) in Newtown. The adjoining land uses are primarily retail with some mixed-use medium-density residential and education land uses. As such, pedestrian occupancy and dwelling is high along King Street
- has high significance for active transport and facilitates pedestrian access and local cycling to retail and recreational destinations and transport interchanges.

Mitchell Road

Mitchell Road is a north-south sub-arterial road that connects Henderson Road at Eveleigh at its northern end and Sydney Park Road at its southern end. The road functions as an alternative parallel rote to Euston Road / McEvoy Street and facilitates through traffic access to Waterloo, Redfern and Sydney CBD as well as local access to Erskineville. The road:

- facilitates city-serving and centre-serving bus services that provide public transport access to residential areas, the wider public transport network, Sydney CBD and other destinations including Marrickville, Leichhardt and Coogee
- has limited active frontages and pedestrian occupancy and dwelling opportunities. The adjoining land uses include low to high-density residential, retail and recreational land uses
- facilitates active transport access to and from local destinations as well as cycling connectivity to the wider regional cycle network.

Euston Road

Euston Road is a state road that forms a part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. The road:

- is classified as a secondary freight route and permits short B-double combination vehicles as part of the higher mass limit network. As with Sydney Park Road, Euston Road provides connectivity for freight movements between industrial areas at St Peters, Alexandria and Beaconsfield, and the wider arterial road network
- does not carry public transport services
- has limited active frontages. The adjoining land uses include industrial, residential, retail and recreational land uses
- provides pedestrian and cycling access to adjoining land uses.

Campbell Street/Campbell Road

Campbell Street/Campbell Road is a sub-arterial road that provides east-west connectivity between Bourke Road at Alexandria to the east and Bedwin Road / May Street / Unwins Bridge Road at St Peters to the west. It also provides connection to the M8 Motorway (Stage 1). The road:

- is not a designated freight route but provides connectivity between the M8 Motorway (Stage 1) and industrial areas at St Peters, Alexandria and Mascot
- does not carry public transport services
- has limited active frontages. The adjoining land uses are low to high density residential, retail, industrial and recreational land uses
- provides access to adjoining residential, retail and industrial land as well as the southern edge of Sydney Park. Cycling and shared pathways are currently being constructed along Campbell Street/Campbell Road as part of local road upgrades around the St Peters interchange (refer to Section 6.11.1).

Parking

Parking provisions within and near the proposal area are described in Section 2.2.2 and shown in Figure 2-3.

Road safety

A review of crash data was undertaken to provide an assessment of safety issues and trends within the proposal area. The crash records used in the assessment comprise the most recent five-year period of finalised crash data, from 1 January 2014 to 31 December 2018. The crash records include Princes Highway between King Street / Sydney Park Road and Campbell Street, and Sydney Park Road between Euston Road / Huntley Street and King Street / Princes Highway. The majority of the five-year period of finalised crash data used in the assessment reflects the configuration of the Euston Road / Huntley Street / Sydney Park Road intersection as a roundabout, with the conversion to traffic signals occurring in November 2018.

In the five-year period from 2014 to 2018, a total of 52 crashes were recorded in the proposal area, with the majority of crashes (37 crashes) occurring on Sydney Park Road.

Analysis of crash statistics show that:

- The majority of crashes (65 per cent) occurred during the day
- The majority of crashes (65 per cent of crashes) resulted in an injury with 12 per cent of crashes resulting in a serious injury.
- Overall, the three most common crash types were crashes involving cross-traffic movements (23 per cent of all crashes), rear-end crashes (17 per cent) and right-turn side-swipe crashes (12 per

cent). The proportions of crashes involving cross-traffic movements and right-turn side-swipe crashes are higher than the Sydney region averages for these type of crashes

- Motorcycles were involved in 11 per cent of all crashes, which is higher than the Sydney region average (eight per cent)
- Cyclists were involved in seven per cent of all crashes, which is higher than the Sydney region average (three per cent). The majority of crashes involving cyclists (60 per cent) occurred at the Euston Road / Huntley Street / Sydney Park Road intersection.

6.1.3 Future conditions without proposal

Future place

Land use changes

The proposal is located near, and provides access to, key centres that are identified in the Eastern City District Plan (discussed in Section 2.1.1). The nearest centres to the proposal are the Newtown, Marrickville and Marrickville Metro local centres to the west, and the Green Square – Mascot strategic centre located further away to the east. Development of these key centres to support predicted population and employment growth is likely to increase the demand for travel for all customer groups on roads in the proposal area.

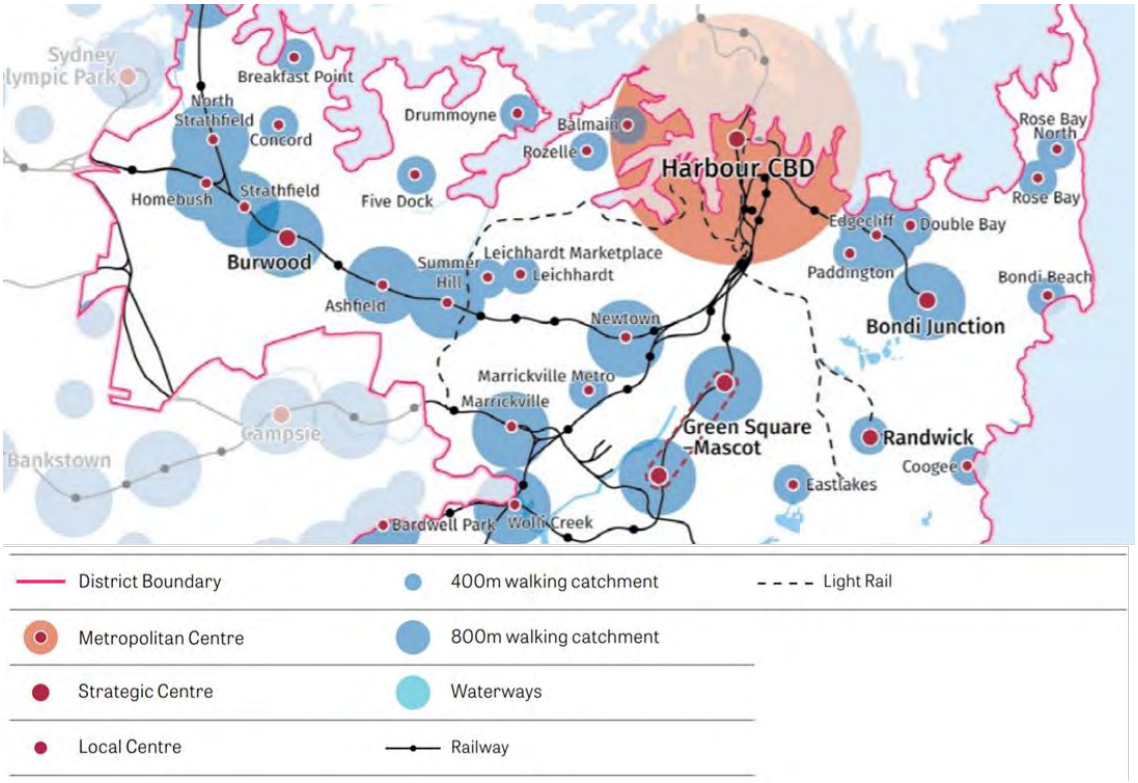

Figure 6-3 Centres within the Eastern City District near the proposal (GSC, 2018b)

The Ashmore Precinct (shown in Figure 2-1) is a 17.4-hectare industrial estate that has been identified for urban renewal including new housing, commercial and retail land uses, community facilities, public open space and active transport facilities. The estate is located in Erskineville to the north of the proposal and is bounded by Ashmore Street, Mitchell Road, Coulson Street and the railway line. The Ashmore Precinct will provide up to 3500 new dwellings to service approximately 6300 new residents. As of November 2019, the majority of redeveloped lots are either under construction, nearing completion or complete.

It is anticipated that the Ashmore Precinct would generate additional demand for travel for all customer groups on roads in and near the proposal area. It is located near key destinations, including Sydney Park and St Peters Station, and is expected to increase pedestrian and cyclist activity in the area, particularly along Sydney Park Road.

Population and employment growth

Population forecasts indicate population growth of approximately 47 per cent (19,400 people) between 2016 and 2036, with the highest growth projected within the Mascot and Erskineville travel zones. Moderate population growth is also projected in the St Peters Station South travel zone due to some redevelopment from industrial to residential land uses along Princes Highway/King Street within the proposal area. Employment forecasts indicate employment growth of approximately 20 per cent between 2016 and 2036, with the highest growth projected within the Mascot and Alexandria travel zones. Population and employment growth is likely to increase the demand for travel for all customer groups on roads in the proposal area.

Future movement

Transport projects, strategies and plans

The future transport network within the study area is expected to be shaped by a number of approved transport projects as well as strategies and plans, including:

- **WestConnex Stage 2 and Sydney Gateway:** WestConnex and Sydney Gateway are integrated motorway projects that aim to provide faster, safer and more reliable journeys across Greater Sydney. The WestConnex M8 Motorway (Stage 1) is a nine-kilometre tunnel that links the M5 Motorway at Kingsgrove to St Peters via the St Peters interchange. St Peters interchange provides surface connections to Gardeners Road (via a bridge over Alexandria Canal), Campbell Road and Euston Road, and will provide underground connections to the future M4-M5 Link, M6 Stage 1 and Sydney Gateway. These are shown in Figure 6-4. Near the proposal, the WestConnex M8 Motorway (Stage 1) and St Peters interchange opened in July 2020, and the WestConnex M4-M5 Link and Sydney Gateway are currently under construction and are expected to open in 2022 and 2023, respectively. The opening of the M8 Motorway (Stage 1), St Peters interchange, related surface road connections and related surface road upgrades are expected to alter traffic patterns in the proposal area, with Euston Road and Campbell Street/Campbell Road replacing Sydney Park Road and Princes Highway/King Street as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo
- **Alexandria to Moore Park Connectivity Upgrade:** The Alexandria to Moore Park Connectivity Upgrade is located to the north-east of the proposal and involves intersection, safety and amenity improvements along the Alexandria to Moore Park corridor (Euston Road, McEvoy Street, Lachlan Street, Dacey Avenue and Alison Road). The project connects to the upgraded Euston Road, which leads to St Peters interchange, M8 Motorway (Stage 1) and upgraded Campbell Street/Campbell Road. The project reinforces the replacement of Sydney Park Road and Princes Highway/King Street with Euston Road and Campbell Street/Campbell Road as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. The project is also expected to increase traffic capacity along the Alexandria to Moore Park corridor to accommodate increased traffic volumes travelling to and from the M8 Motorway (Stage 1)
- **Alexandria local area traffic management plans:** The Alexandria local area traffic management plan is a series of traffic management treatments (such as road closures) being developed and implemented by the City of Sydney. The treatments aim to minimise the potential impacts of forecast additional traffic from St Peters interchange on the local road network in Alexandria and would reinforce the use of Euston Road and McEvoy Street for regional through traffic
- **Sydney Metro City and Southwest:** Sydney Metro City and Southwest is a new railway line that will connect the existing Sydney Metro network from Chatswood to Sydenham via new metro stations and a conversion of the existing T3 Bankstown Line for metro services. The project is currently under construction with target completion in 2024. The proposed Waterloo and Sydenham metro stations are located within 1.6 kilometres of the proposal and are anticipated to facilitate a significant mode shift from general traffic to rail (and supporting bus services)

- **Greater Sydney Green Grid:** The Greater Sydney Green Grid (described in Section 2.1.1) is a long-term vision for a network of high-quality green areas, from regional parks to local parks and playgrounds, that connect centres, public transport and public spaces to green infrastructure and landscape features. Routes in or near the proposal area identified as part of the Greater Sydney Green Grid include the Illawarra Rail Line (Wolli Creek to Redfern), Alexandra Canal and the Bourke Street and George Street Active Transport Green Links
- **Walking Strategy and Action Plan:** The Walking Strategy and Action Plan (described in Section 2.1.1) identifies Sydney Park Road between Mitchell Road and King Street as part of the primary walking network. King Street is identified as a main activity street, with footpath capacity and walking amenity to be increased by 20 per cent and 10 per cent respectively through planned upgrades
- **Cycling Strategy and Action Plan:** The Cycling Strategy and Action Plan (described in Section 2.1.1) outlines planned cycling routes within the City of Sydney local government area to serve regional and local journeys, shown in Figure 6-5. Planned regional and local cycling routes near the proposal include:
    - Regional route along Sydney Park Road between Mitchell Road and King Street/Princes Highway, connecting to planned regional routes along Mitchell Road and Huntley Street and the existing regional route along Belmont Street
    - Local route along Sydney Park Road between Euston Road/Huntley Street and Mitchell Road, connecting to planned local routes along Euston Road and Huntley Street.
- **Greater Sydney Services and Infrastructure Plan:** The Greater Sydney Services and Infrastructure Plan (described in Section 2.1.1) describes aspirational future city-shaping and city-serving public transport networks in 2056. The city-shaping network includes higher-speed and volume links between the three cities and other centres. The city-serving network provides on-demand or high-frequency services to customers within 10 kilometres of metropolitan centres. Mode shift towards public transport is likely to occur as 30-minute public transport accessibility improves in line with city-serving and city-shaping corridors gradually becoming operational over the next 40 years. The proposal is located near the following city-shaping and city-serving corridors:
    - Harbour CBD to Sydney Airport
    - Harbour CBD to Sutherland
    - Harbour CBD to Liverpool.

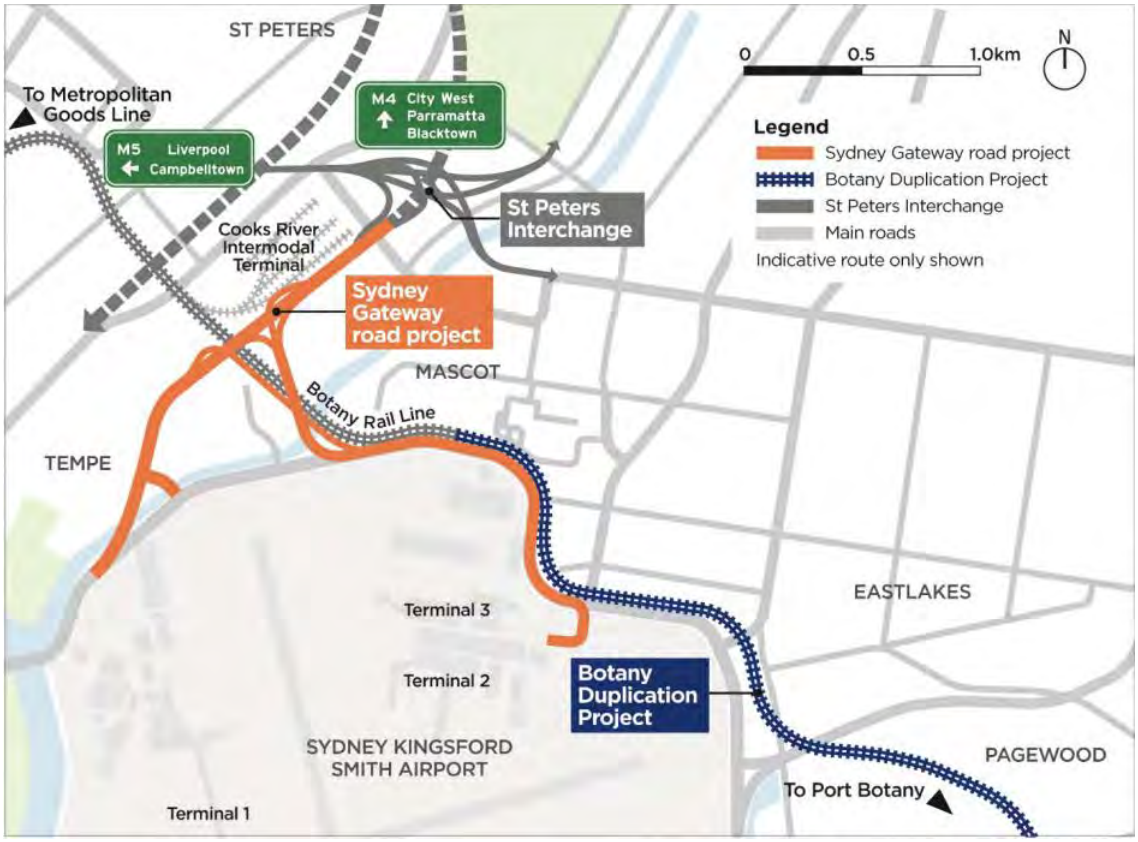

Figure 6-4 Existing and planned road projects near the proposal (Roads and Maritime Services, 2019)

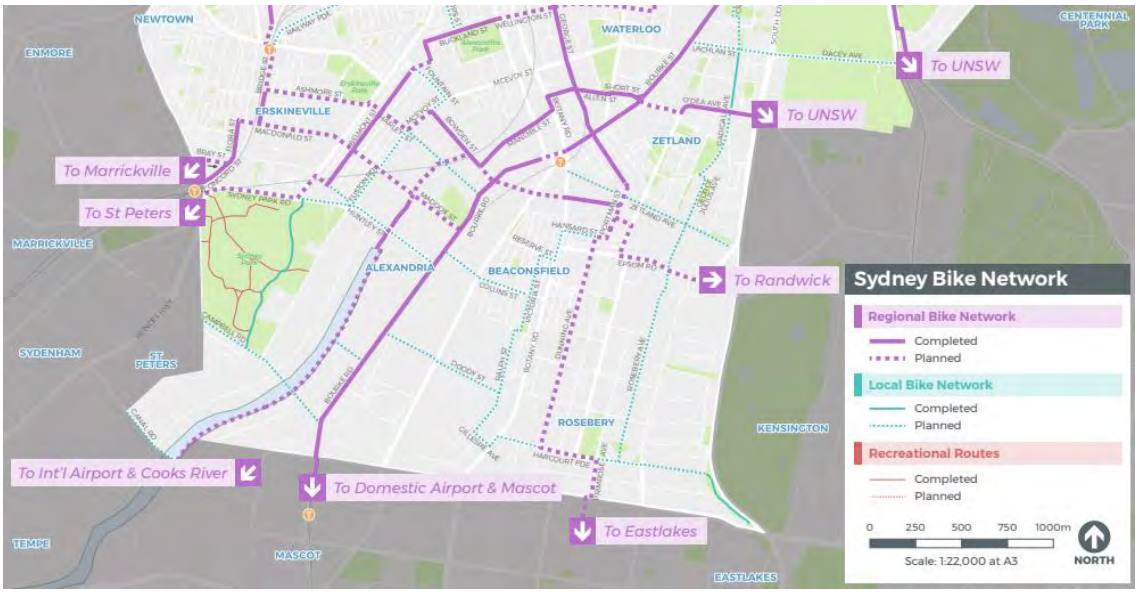

Figure 6-5 Planned regional, local and recreational cycling routes near the proposal

General traffic and freight

The function of key roads in the proposal area would be impacted significantly by nearby land use changes and transport projects. The opening of the M8 Motorway (Stage 1), St Peters Interchange, related surface road connections and related surface road upgrades are expected to have altered traffic patterns in the proposal area since this assessment, with Euston Road and Campbell Street/Campbell Road replacing Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. In addition, the Alexandria to Moore Park Connectivity Upgrade is expected to increase traffic capacity along the Alexandria to Moore Park corridor to accommodate increased traffic volumes travelling to and from the M8 Motorway (Stage 1). Land use developments including the Ashmore Precinct are expected to increase the demand for travel for all customer groups. However, Sydney Metro City and Southwest is expected to facilitate significant mode shift away from general traffic to rail (and supporting bus services).

Euston Road is anticipated to have a significantly increased movement function for general traffic and freight as the road facilitates north-south connectivity between the St Peters Interchange and the Alexandria to Moore Park corridor. Euston Road also provides connectivity for freight movements between industrial areas at St Peters, Alexandria and Beaconsfield and the wider motorway network. Campbell Street/Campbell Road are also expected to have a significantly increased movement function for general traffic and freight by providing access between the wider motorway and arterial road networks. The extension of Campbell Road over the Alexandra Canal provides an additional east-west connection between Alexandria and the St Peters Interchange.

In contrast, Sydney Park Road and Princes Highway/King Street between Campbell Street and Lord Street are expected to have a decreased movement function for general traffic and freight. These roads would primarily facilitate local access to residential areas in Newtown, Erskineville and St Peters, as well as access to the Newtown activity precinct. These roads would also carry less long-distance freight movements and service last-mile light freight movements to the Newtown activity precinct.

King Street is anticipated to retain its existing high movement function for general traffic, bus and active transport customers.

Traffic volumes and patterns

The anticipated approximate peak hour traffic volumes on key roads in 2023 and 2033 are shown in Figure 6-6. The predicted overall change in traffic volumes without the proposal between 2019, 2023 and 2033 is summarised in Table 6-6.

Euston Road and Campbell Street/Campbell Road are forecast to carry a significantly higher amount of traffic in 2023 and 2033 due to the M8 Motorway (Stage 1) connections at the St Peters interchange. Princes Highway/King Street (between Campbell Street and Lord Street) is forecast to carry lower volumes of traffic in 2023 with a further decrease between 2023 and 2033. Sydney Park is forecast lower volumes in 2023 and approximately the same in 2033. King Street (north of Lord Street is forecast to carry approximately the same amount of traffic in 2023 with a decrease between 2023 and 2033. Mitchell Road is forecast to carry approximately the same amount of traffic in 2023 and 2033.

The peak directions of traffic are forecast to be northbound and eastbound during the morning peak hours and southbound and westbound during the evening peak hours.

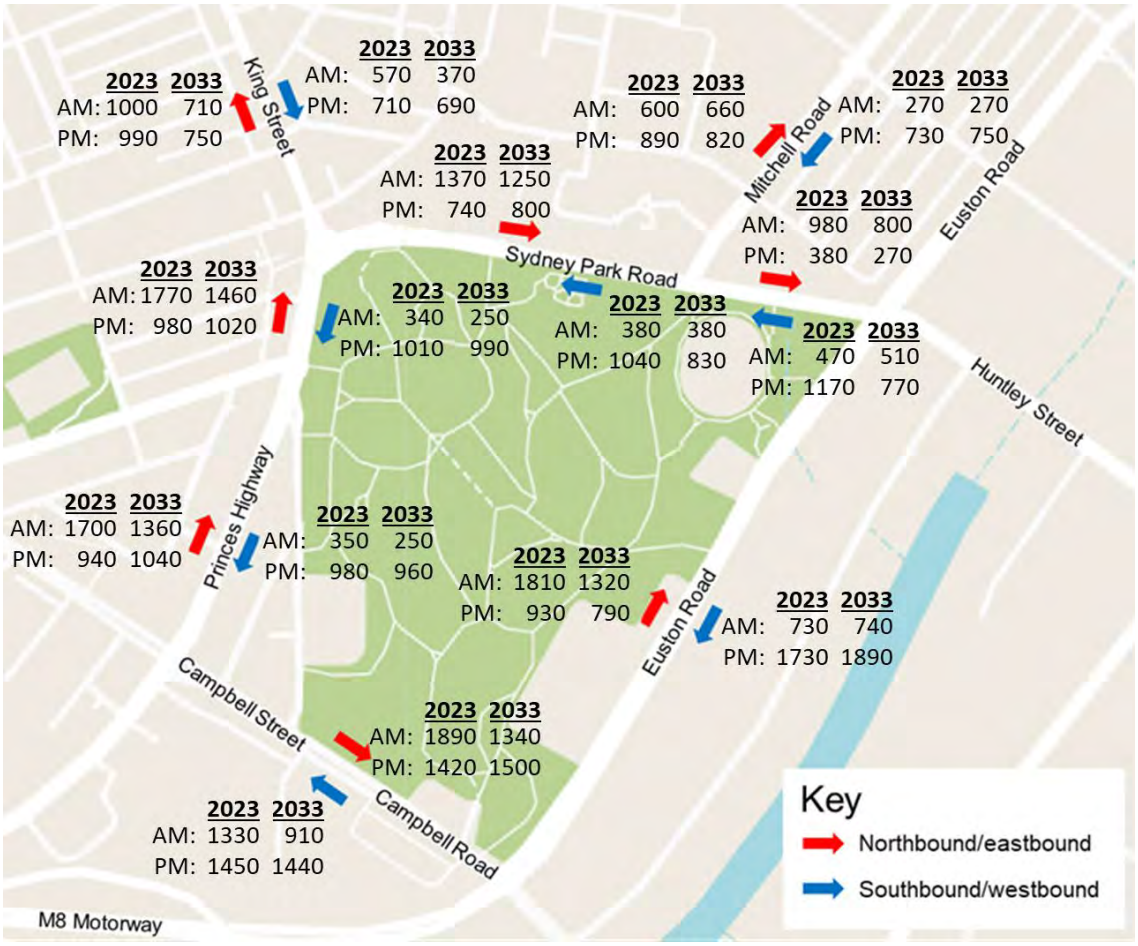

Figure 6-6 Predicted peak hour traffic volumes by direction without the proposal (2023 and 2033)

Table 6-6 Predicted traffic volume changes without the proposal (2019, 2023 and 2033)

Road	Direction	2019 - 2023				2019 - 2033			
		AM peak change		PM peak change		AM peak change		PM peak change	
		Vehicles per hour	%	Vehicles per hour	%	Vehicles per hour	%	Vehicles per hour	%
King Street, north of Sydney Park Road	Northbound	290	41%	-10	-1%	5	1%	-245	-25%
	Southbound	-135	-19%	-140	-16%	-325	-47%	-165	-20%
Princes Highway, between Sydney Park Road and May Street	Northbound	-90	-5%	-320	-24%	-405	-22%	-280	-22%
	Southbound	-350	-50%	-1085	-52%	-440	-63%	-1105	-53%
Princes Highway, between May Street and Campbell Street	Northbound	190	12%	-150	-14%	-155	-10%	-55	-5%
	Southbound	-195	-36%	-570	-37%	-300	-55%	-580	-38%
Sydney Park Road, between Euston Road and Mitchell Road	Eastbound	-175	-15%	-210	-36%	-360	-31%	-325	-55%
	Westbound	-120	-20%	-470	-29%	-80	-14%	-875	-53%
Sydney Park Road, between Mitchell Road and King Street / Princes Highway	Eastbound	-360	-21%	-285	-28%	-485	-28%	-225	-22%
	Westbound	-200	-35%	-925	-47%	-195	-33%	-1135	-58%
Mitchell Road, north of Sydney Park Road	Northbound	-130	-18%	180	26%	-70	-9%	110	15%
	Southbound	30	13%	115	19%	35	15%	140	23%
Euston Road, between Huntley Street / Sydney Park Road and Campbell Road	Northbound	1805	-	935	-	1315	-	785	-
	Southbound	590	>100%	1635	>100%	600	>100%	1795	>100%
Campbell Street / Campbell Road, between Euston Road and Princes Highway	Eastbound	1340	>100%	1080	>100%	790	>100%	1160	>100%
	Westbound	925	>100%	775	>100%	500	>100%	775	>100%

* Northbound direction not permitted on Euston Road in 2019

Intersection performance

Modelled intersection performance for 2023 and 2033, summarised in Table 6-7, indicates that the following intersections would perform at LoS F:

- King Street / Sydney Park Road in 2023 during the weekday morning peak hour. This is due to high volumes of conflicting traffic from the northbound and westbound approaches
- Princes Highway / May Street in 2023 during the weekday morning peak hour. This is due to northbound congestion downstream at the King Street / Sydney Park Road intersection where there are high volumes of through traffic conflicting with right-turning and cross-street traffic
- Princes Highway / Campbell Street in 2023 during the weekday morning peak hour and in 2031 during the weekday morning and evening peak hours. This is due to high volumes of conflicting traffic, particularly from the northbound, eastbound and westbound approaches
- Mitchell Road / Sydney Park Road in 2023 during the weekday morning peak hour and in 2031 during the weekday morning and evening peak hours. This is due to high volumes of east-west traffic on Sydney Park Road
- Euston Road / Campbell Road in 2023 during the weekday morning and evening peak hours. This is due to high volumes of conflicting traffic, particularly from the northbound, eastbound and westbound approaches.

Table 6-7 Modelled intersection performance without the proposal (2023 and 2033)

Intersection and peak hour	2021 without proposal			2031 without proposal		
	Intersection throughput (vehicles / hour)	Average delay (seconds / vehicle)	Level of Service	Intersection throughput (vehicles / hour)	Average delay (seconds / vehicle)	Level of Service
King Street / Sydney Park Road						
Morning	2720	36	C	2220	103	F
Evening	2730	33	C	2535	52	D
Princes Highway / May Street						
Morning	2285	28	B	1845	174	F
Evening	2175	21	B	2220	34	C
Princes Highway / Campbell Street						
Morning	5010	119	F	3690	245	F
Evening	4675	45	D	4650	75	F
Euston Road / Huntley Street / Sydney Park Road						
Morning	3985	120	F	3265	156	F
Evening	3955	88	F	3600	119	F
Mitchell Road / Sydney Park Road						
Morning	2035	91	F	1940	193	F
Evening	2600	57	E	2240	138	F
Euston Road / Campbell Road / M8 Motorway (Stage 1) ramps						
Morning	4490	60	E	3695	190	F

Intersection and peak hour	2021 without proposal			2031 without proposal		
	Intersection throughput (vehicles / hour)	Average delay (seconds / vehicle)	Level of Service	Intersection throughput (vehicles / hour)	Average delay (seconds / vehicle)	Level of Service
Evening	4290	42	C	4795	169	F

Road safety

A review of crash data identified a number of road safety issues within the proposal area, as summarised in Section 0. Without intervention, it is anticipated that these road safety issues would continue in the long-term.

6.1.4 Potential impacts

Construction

Road network

As described in Section 3.3.1, the proposal would be constructed in two construction zones over approximately 20 months (weather permitting), starting in 2022. As outlined in Section 3.3.3, construction activities would occur primarily during the standard construction working hours (between 7:00am to 6:00pm on weekdays and between 8:00am to 1:00pm on Saturdays).

Construction activities would generate additional traffic to transport staff, materials, equipment, excess spoil and waste to and from the proposal area. The proposal would require on average up to 30 light vehicles and 10 heavy vehicles per day, which would result in 60 light vehicle and 20 heavy vehicle movements per day (two movements per vehicle). During peak construction periods, up to 40 heavy vehicle and 120 light vehicle movements would potentially be required per day for construction.

Construction traffic and operational and alignment changes to the road network (outlined in Section 3.3.1) would likely lead to increased travel times on the road network near the proposal area. The increase in construction vehicles and changes in the road conditions and general traffic movement could also potentially impact on road safety.

Construction vehicles would generally access construction sites via the M8 Motorway (Stage 1), Euston Road and Campbell Street/Campbell Road as shown in Figure 6-7. It is anticipated that construction traffic movements in each of the two construction zones would adopt a “left-in, left-out” access arrangement.

In order to minimise impacts on traffic, construction would be staged to enable work to be completed safely and efficiently while maintaining traffic flows at all times and minimising overall impacts on nearby residents and businesses. Standard traffic management measures would be used to minimise short-term traffic impacts, and ensure that traffic flow along is maintained throughout construction. Speed limits would be reduced to 40 kilometres per hour where required through the site to ensure the safety of staff and motorists. Some works, such as works within the road median, would be undertaken out of hours to minimise disruption to daily traffic. Variable Message Signs (VMS) signs would be installed to inform road users of the work and to encourage through and regional traffic to use Euston Road and Campbell Street / Campbell Road instead of Princes Highway and Sydney Park Road.

Further detail on construction activities and staging is provided in Section 3.

Figure 6-7 Proposed construction vehicle routes

Ancillary facilities

Site compounds and ancillary facilities will be located at Burrows Road and Venice Street, Mascot on TfNSW-owned land. Additional compound and stockpile sites may be required for equipment laydown, stockpiling and staff parking. The location of these sites would be confirmed prior to construction and the final number of vehicles accessing the ancillary facility would be determined by the construction contractor.

Pedestrians and cyclists

Pedestrian and cyclist routes would be managed on a daily basis in accordance with construction activities planned for the particular day. Alternative pedestrian and cycling routes would be provided where necessary to ensure safe access and pedestrian crossings would be maintained where possible.

Public transport

The proposal involves the relocation of bus stops. There would also be temporary changes to bus stop locations along the proposal during construction. Bus routes would potentially be subjected to delays and consequently increased travel times. The provision of some temporary bus stops would be required while bus stops are being relocated or when the construction works restrict public access to existing bus stops. Any proposed relocation would consider implications (such as walking distance to the new bus stop) for commuters. Consultation would be carried out with the bus service providers and emergency services prior to the commencement of construction.

Access to St Peters Station would be maintained throughout construction.

Parking and access

The availability of street parking would be temporarily impacted when works are being undertaken along roads where on-street parking is provided. As works would be undertaken in stages, alternate on-street parking would be available at all times on other parts of the road network. Staff parking is likely to be provided at the ancillary facility and construction compounds. It is not expected that surplus parking demand from construction activities would reduce the availability of surrounding public parking.

Access to properties (residential and business near the construction works would be maintained during construction. Where temporary changes are required, suitable access arrangements would be implemented in consultation with affected property and business owners.

Disturbed areas would be progressively reinstated so as to limit any impacts to property access and street parking.

The proposal would also result in a number of changes to on-street kerbside parking shown below in Table 6-8.

Table 6-8 Parking spaces with and without the proposal

Road	No. of car park spaces without the proposal (total length of parking provision)	No. of car park spaces with the proposal (total length of parking provision)
Sydney Park Road	38 (252m)	30 (189m)
May Street	4 (27m)	13 (82m)
King Street between May Street and Goodsell Street	6 (40m)	0
Princes Highway between Campbell Street and May Street (western side)	38 (241m)	31 (197m)
Princes Highway between Campbell Street and May Street (eastern side)	33 (210m)	30 (192m)
Total	119 (770m)	104 (660m)

Cumulative impacts

Several developments/projects are currently being constructed/planned near the proposal. The cumulative traffic and transport impacts of other construction work nearby occurring concurrently with the construction of the proposal are considered in Section 6.11. Cumulative impacts are expected to be limited to additional light and heavy vehicles movements on the road network near the proposal that would potentially increase congestion and travel times in the road network.

Operation

Road network

Traffic volumes and patterns

A summary of traffic volumes and patterns forecast for 2023 and 2033 is provided in Table 6-9. Increases in traffic volumes are shown in green, with increases greater than 50 per cent shown in dark green. Decreases in traffic volumes are shown in orange, with decreases greater than 50 per cent shown in dark orange. The proposal would reduce the number of vehicles within the proposal area significantly compared to the scenario without the proposal (refer to Table 6-6):

- King Street (south of Lord Street) and Princes Highway (north of Campbell Street) would carry up to 55 per cent fewer vehicles in 2023 and up to 66 per cent fewer vehicles in 2033 with the proposal when compared to the scenario without the proposal.
- Sydney Park Road would carry up to 71 per cent fewer vehicles in 2023 and up to 65 per cent fewer vehicles in 2033 with the proposal when compared to the scenario without the proposal.
- King Street (north of the rail overbridge) would carry up to 47 per cent fewer vehicles in 2023 and up to 46 per cent fewer vehicles in 2033 with the proposal when compared to the scenario without the proposal.
- Mitchell Road would carry up to 57 per cent fewer vehicles in 2023 and up to 54 per cent fewer vehicles in 2033 with the proposal when compared to the scenario without the proposal.
- Campbell Street/Campbell Road would up to 11 percent less vehicles in 2023 and up to 26 per cent more vehicles in 2033 with the proposal when compared to the scenario without the proposal.
- Euston Road would carry up to 15 per cent more vehicles in 2023 and up to 16 per cent more vehicles in 2033 with the proposal when compared to the scenario without the proposal.

Approximate peak hour traffic volumes on key roads with and without the proposal are shown in Figure 6-8 (2023) and Figure 6-9 (2033). The peak directions of traffic would be similar to the existing scenario and the scenario without the proposal.

Overall, traffic volume reductions confirm the proposal would reinforce the replacement of Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) with Euston Road and Campbell Street/Campbell Road as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. The reductions in traffic volumes on Sydney Park Road, King Street (south of Lord Street), Princes Highway (north of Campbell Street) and Mitchell Road also confirm these roads would serve mostly local traffic with origins or destinations in Newtown, Erskineville or Alexandria.

Table 6-9 Traffic volume changes with the proposal (2019, 2023 and 2033)

Road	Direction	2019 - 2023				2019 - 2033			
		AM peak change		PM peak change		AM peak change		PM peak change	
		Vehicles per hour	%	Vehicles per hour	%	Vehicles per hour	%	Vehicles per hour	%
King Street, north of Sydney Park Road	Northbound	150	21%	-475	-48%	60	8%	-400	-40%
	Southbound	-185	-26%	-210	-25%	-500	-71%	-265	-31%
Princes Highway, between Sydney Park Road and May Street	Northbound	-700	-38%	-835	-64%	-1335	-72%	-955	-73%
	Southbound	-450	-65%	-1545	-74%	-600	-87%	-1625	-78%
Princes Highway, between May Street and Campbell Street	Northbound	-370	-25%	-670	-61%	-580	-38%	-370	-34%
	Southbound	-295	-54%	-990	-64%	-455	-83%	-1070	-69%
Sydney Park Road, between Euston Road and Mitchell Road	Eastbound	-375	-32%	-80	-13%	-765	-66%	80	13%
	Westbound	140	23%	-1085	-66%	-110	-18%	-1100	-67%
Sydney Park Road, between Mitchell Road and King Street / Princes Highway	Eastbound	-795	-46%	-715	-70%	-1070	-62%	-435	-42%
	Westbound	-255	-44%	-1660	-85%	-325	-56%	-1675	-85%
Mitchell Road, north of Sydney Park Road	Northbound	10	2%	-330	-46%	-160	-22%	-220	-31%
	Southbound	-30	-13%	-230	-37%	-80	-33%	-265	-43%
Euston Road, between Sydney Park Road and Campbell Road	Northbound*	2020	-	745	-	1525	-	850	-
	Southbound	700	>100%	1380	>100%	685	>100%	1945	>100%
Campbell Street/Campbell Road, between Euston Road and Princes Highway	Eastbound	1140	>100%	965	>100%	1135	>100%	1150	>100%
	Westbound	825	>100%	750	>100%	735	>100%	975	>100%

* Northbound direction not permitted on Euston Road in 2019

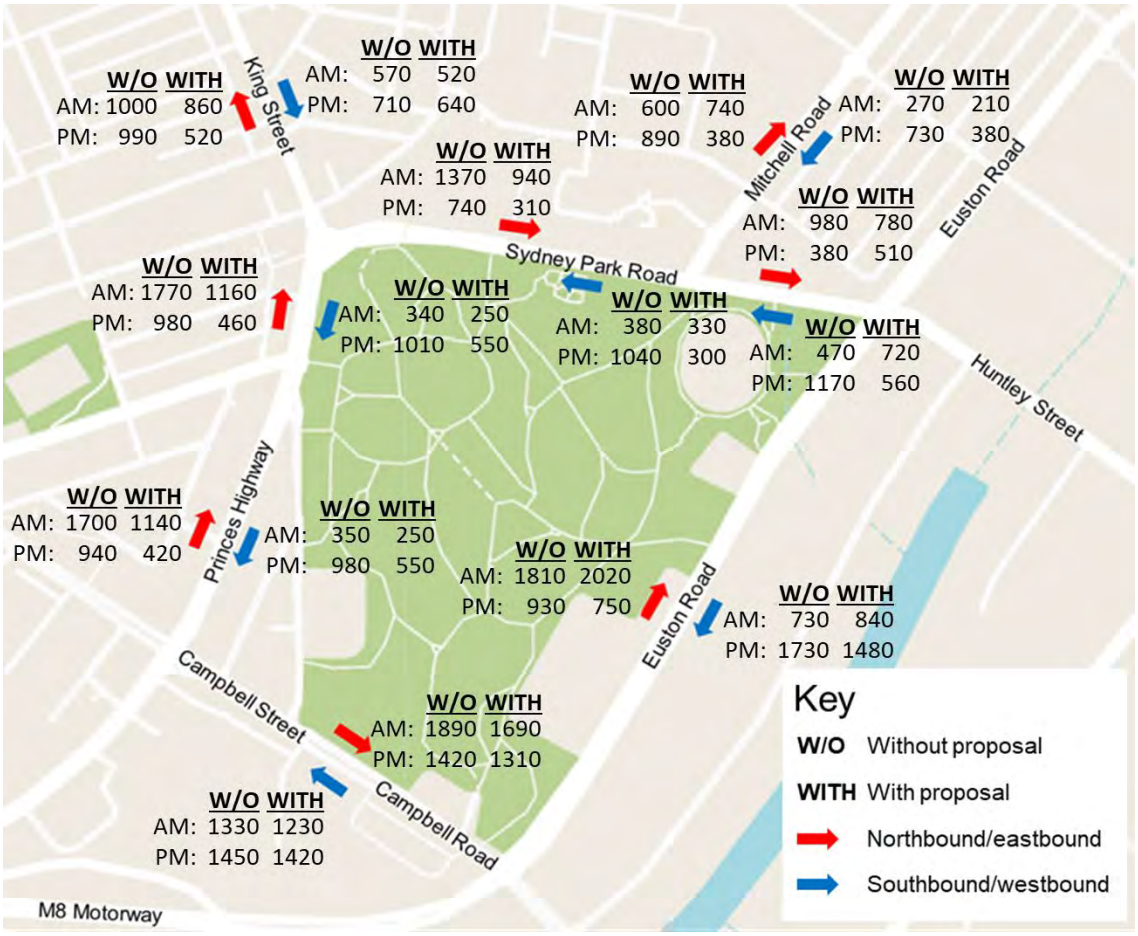

Figure 6-8 Peak hour traffic volumes with and without the proposal (2023)

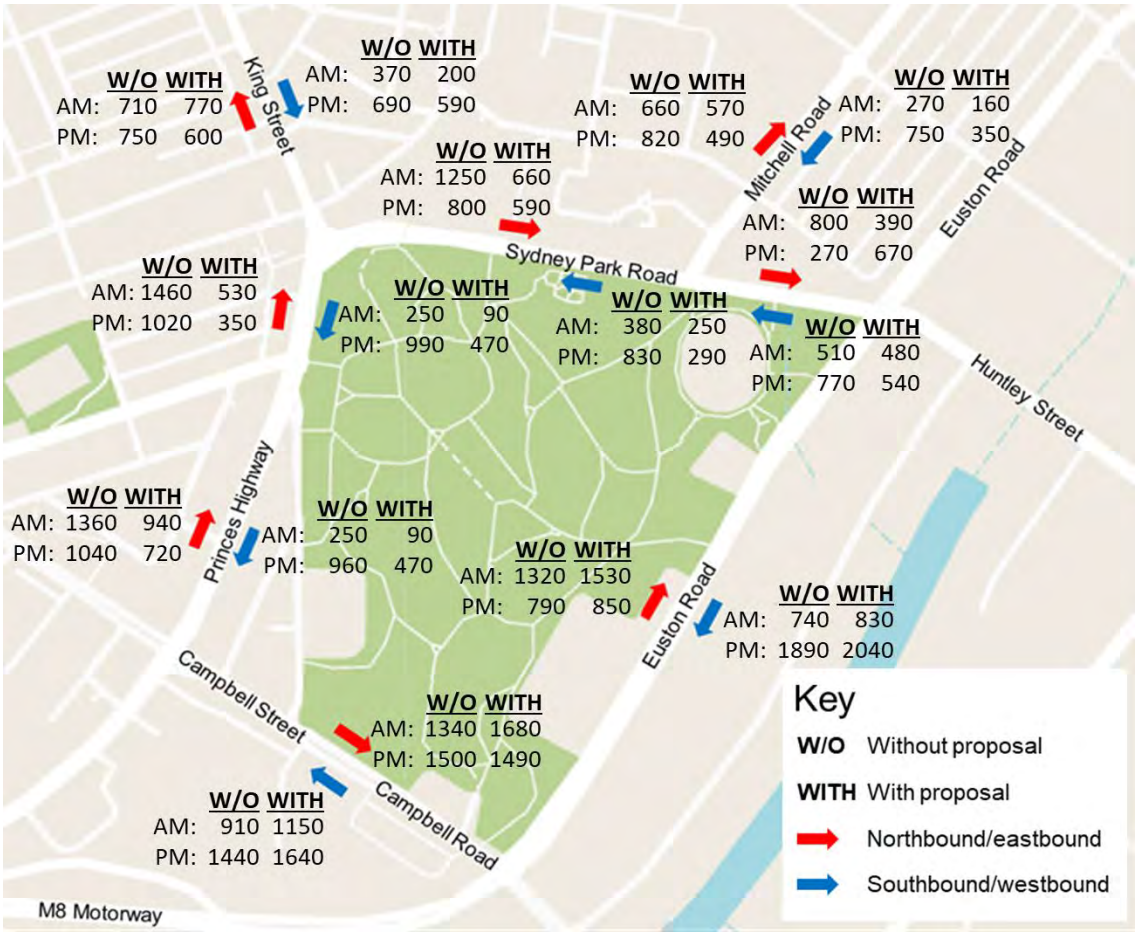

Figure 6-9 Peak hour traffic volumes with and without the proposal (2031)

Intersection performance

Modelled performance of key intersections in the modelling study area with and without the proposal during the weekday morning and evening peak hours is shown in Table 6-10 (2023) and Table 6-11 (2033).

Modelled intersection performance indicates that the following intersections would perform at a worse LoS when compared to the scenario without the proposal:

- King Street / Sydney Park Road in 2023 during the weekday morning and evening peak hours. This is due to high volumes of conflicting traffic from the northbound and westbound approaches
- Princes Highway / May Street in 2023 during the weekday morning and evening peak hours. This is due to northbound congestion downstream at the King Street / Sydney Park Road intersection where there are high volumes of through traffic conflicting with right-turning and cross-street traffic
- Princes Highway / Campbell Street in 2023 during the weekday evening peak hour. This is due to high volumes of conflicting traffic, particularly from the northbound, eastbound and westbound approaches
- Mitchell Road / Sydney Park Road in 2023 during the weekday evening peak hour. This is due to high volumes of east-west traffic on Sydney Park Road
- Euston Road / Campbell Road in 2023 during the weekday evening peak hour. This is due to high volumes of conflicting traffic, particularly from the northbound, southbound and westbound approaches.

All intersections would perform at the same LoS in 2033 when compared to the scenario without the proposal. The average delay varies between being greater without the proposal and greater with the proposal though generally it is similar across intersections.

Table 6-10 Modelled peak hour intersection performance with and without the proposal (2023)

Intersection and peak hour	2023 without proposal			2023 with proposal		
	Intersection throughput (vehicles / hour)	Average delay (seconds / vehicle)	Level of Service	Intersection throughput (vehicles / hour)	Average delay (seconds / vehicle)	Level of Service
King Street / Sydney Park Road						
Morning	2720	36	C	2045	80	F
Evening	2730	33	C	1380	97	F
Princes Highway / May Street						
Morning	2285	28	B	1540	149	F
Evening	2175	21	B	1100	110	F
Princes Highway / Campbell Street						
Morning	5010	119	F	4175	196	F
Evening	4675	45	D	3550	119	F
Euston Road / Huntley Street / Sydney Park Road						
Morning	3985	120	F	4000	88	F
Evening	3955	88	F	2875	146	F
Mitchell Road / Sydney Park Road						
Morning	2035	91	F	1865	85	F
Evening	2600	57	E	1190	205	F
Euston Road / Campbell Road / M8 Motorway (Stage 1) ramps						
Morning	4490	60	E	4445	57	E
Evening	4290	42	C	3850	85	F

Table 6-11 Modelled peak hour intersection performance with and without the proposal (2033)

Intersection and peak hour	2033 without proposal			2033 with proposal		
	Intersection throughput (vehicles / hour)	Average delay (seconds / vehicle)	Level of Service	Intersection throughput (vehicles / hour)	Average delay (seconds / vehicle)	Level of Service
King Street / Sydney Park Road						
Morning	2220	103	F	1525	96	F
Evening	2535	52	D	1660	46	D
Princes Highway / May Street						
Morning	1845	174	F	1255	226	F
Evening	2220	34	C	1380	37	C
Princes Highway / Campbell Street						
Morning	3690	245	F	3670	213	F
Evening	4650	75	F	4090	168	F
Euston Road / Huntley Street / Sydney Park Road						
Morning	3265	156	F	3165	177	F
Evening	3600	119	F	3625	106	F
Mitchell Road / Sydney Park Road						
Morning	1940	193	F	1295	140	F
Evening	2240	138	F	1450	114	F
Euston Road / Campbell Road / M8 Motorway (Stage 1) ramps						
Morning	3695	190	F	4050	156	F
Evening	4795	169	F	4805	142	F

The decrease in intersection performance with the proposal in operation, as shown by decreases in LoS and increases in average delays, is to be expected when lane capacity is removed from an already congested network. The following are potential impacts of removing lane capacity from traffic networks that are already operating at or close to capacity (which is effectively the same as additional vehicles being introduced to the network):

- Increased queuing and congestion
- Retiming of vehicle trips to either side of the peak to avoid congestion, resulting in ‘peak spreading’
- Rerouting of vehicle trips to other roads to avoid congestion
- Use of other modes such as active transport or public transport
- Other behavioural changes such as changing origin / destination or not undertaking the trip at all.

Traffic modelling assumes that only increased queuing and congestion would occur and does not account for other potential impacts listed above that would avoid congestion on the road network. Furthermore, the process for calculating demand for 2023 (linear interpolation between 2021 and 2031) does not account for the step-change in traffic flow which is likely to take place with the opening of nearby transport infrastructure projects, including WestConnex M4-M5 Link and Sydney Gateway, which are expected to open in 2022 and 2023 respectively. Therefore, it is considered that the traffic modelling presents a worst-case scenario.

It is considered the impacts of the decrease in intersection performance on general traffic and freight customers are relatively minor and manageable when considered in the context of the positive impacts of the proposal on the movement and place performance for active transport customers as described below. Notwithstanding this, management measures have been proposed which would address the impacts of the decrease in intersection performance on general traffic and freight customers. These are described in Section 6.1.5.

Parking

The proposal would provide an additional nine car park spaces on May street which include angled parking and on-street kerbside parking. The proposal would also improve accessibility to the Sydney Park car park along Sydney Park Road with the provision of right-turn movements from Sydney Park Road in the eastbound direction.

The proposal would reduce on-street kerbside parking on Sydney Park Road by approximately eight car park spaces as a result of the landscape build outs. There would also be a reduction of approximately three car parks spaces on the eastern side of Princes Highway and a reduction of seven car park spaces on the western side of Princes Highway to accommodate for the mid-block crossing. Six car park spaces would also be removed between May Street and Goodell Street to allow for kerb modifications.

Function and significance of key roads

The function of some roads would be impacted by the proposal. In combination with the opening of WestConnex Stage 2 (including the St Peters interchange, related surface road connections and upgrades) and the Alexandria to Moore Park Connectivity Upgrade, the proposal would result in Euston Road and Campbell Street/Campbell Road replacing Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo.

Euston Road would have an increased movement function for general traffic and freight as the road facilitates north-south connectivity between the St Peters Interchange and the Alexandria to Moore Park corridor. Euston Road also provides connectivity for freight movements between industrial areas at St Peters, Alexandria and Beaconsfield and the wider motorway network. Campbell Street/Campbell Road would also have an increased movement function for general traffic and freight by providing access between the wider motorway and arterial road networks. The extension of Campbell Road over the Alexandra Canal provides an additional east-west connection between Alexandria and the St Peters interchange.

In contrast, Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) would have a decreased movement function for general traffic and freight customers and increased movement function for active transport customers. Princes Highway would remain a State road whereas Sydney Park Road would be declassified to become a local road. King Street (south of Lord Street), Princes Highway (north of Campbell Street) and Sydney Park Road would primarily facilitate local access to residential areas in Newtown, Erskineville and St Peters, as well as access for pedestrians and cyclists to Sydney Park, St Peters Station and the Newtown activity precinct. These roads would also carry less long-distance freight movements and service last-mile light freight movements to the Newtown activity precinct.

King Street (north of Lord Street) would retain its existing high movement function for general traffic, bus and active transport customers.

Impacts on movement and place

The proposal is anticipated to significantly improve the overall movement and place performance of the surrounding built environment, as per the *Practitioner's Guide to Movement and Place* (discussed in Section 6.1.1). The impact of the proposal on movement and place is described in Table 6-12.

Table 6-12 Movement and place performance of the built environment with the proposal

Built environment theme	User outcomes	Impact of the proposal
Access and connection	• Mode choice • Reliable transport • Equity (of access)	• Encourage cycling due to the increased number of formal crossing opportunities and dedicated cycle paths • Encourage walking due to the increased number of formal crossing opportunities, footpath widening and landscaping • Encourage the shift to sustainable modes of travel • Minimal impacts to bus travel due to the potential minor increase in travel time.
Amenity and Use	• Convenient facilities • Local opportunities	• Improved end-of-trip facilities on Sydney Park Road, King Street between May Street and Goodsell Street, May Street and the Sydney Park car park along King Street/Princes Highway due to increased parking provision • Impacts to end-of-trip facilities on Goodsell Street and Princes Highway (outside of clearway restrictions) due to reduced on-street kerbside parking.
Green and Blue	• A link to nature	• Improved vegetation and tree canopy cover due to landscaping.
Comfort and Safety	• Comfortable environment • Low risk	• Improved road user safety due to increased number of formal crossing opportunities, footpath widening, dedicated cycleways and speed limit reductions • Improved environmental quality due to increased vegetation cover, heavy vehicle separation and reduced urban heat-island effect and vehicle noise and air pollution.
Character and Form	• Human-scaled • Distinct features	• Improved access due to increased number of formal crossing opportunities • Improved dwellable street space due to dynamic community spaces, footpath widening and dedicated cycleways.

Pedestrians and cyclists

Pedestrians

The proposed footpath widening, landscaping and increase in the number of formal crossing opportunities would significantly improve pedestrian movement. The additional formal crossing opportunities (described in Section 1.1) would significantly improve connectivity by reducing the distance between formal crossing opportunities to a maximum of approximately 200 metres on Princes Highway (between Short Street and Barwon Park Road) and approximately 280 metres on Sydney Park Road (between Euston Road and Mitchell Road). Furthermore, these additional formal crossing opportunities would allow direct connectivity and shorten overall walking distances to destinations such as Sydney Park, St Peters Station, bus stops on Princes Highway and Sydney Park Road, and retail and commercial land uses on Princes Highway near Short Street. Pedestrian crossings on Princes Highway at Barwon Park Road and on King Street between Goodsell Street and May Street would counter connectivity impacts resulting from the removal of traffic signals at the Princes Highway / May Street intersection.

Footpath widening along Princes Highway and Sydney Park Road would improve walking accessibility and pedestrian movement. In addition, improved landscaping, bollards, dynamic community spaces would improve walking comfort by increasing separation between pedestrians and traffic. This is particularly significant for Princes Highway as the existing footpath has limited separation with the road, which carries high adjacent vehicle flows with a 60 kilometres per hour speed limit.

The reduction in traffic lanes and traffic volumes, footpath widening and landscaping would also improve the sense of place for pedestrians. Pedestrian dwelling opportunities are expected to improve due to a reduction in traffic lanes on Princes Highway and Sydney Park Road, which would reduce adjacent vehicle flows and improve the pedestrian environment. Footpath widening and landscaping would contribute to the concept of place by increasing the amount of dwelling space for pedestrians and improving safety by increasing separation between pedestrians and traffic.

Cyclists

As with pedestrians, the cyclist movement on King Street/Princes Highway and Sydney Park Road would improve significantly as a result of the increased number of formal crossing opportunities and dedicated cycle paths. The additional formal crossing opportunities (described in Section 1.1) would improve cycling connectivity across King Street/Princes Highway and Sydney Park Road, including the Sydney Park Cycle Centre on Sydney Park Road. Furthermore, a permanent two-way on-road segregated cycleway on the northern side of Sydney Park Road would improve cycling facilities by replacing the existing temporary cycleway and provide connectivity to cycling facilities on Huntley Street and the wider regional cycle network. In addition, a new on-road cycleway on the western side King Street between May Street and St Peters square would also improve the cycling environment and safety on Sydney Park Road by removing conflicts with pedestrians and further delineating cyclists from traffic.

Public transport

Minimal impacts to buses are expected and would be limited to a potential minor increase in travel time due to the reduction in the number of lanes available to traffic on Sydney Park Road and King Street/Princes Highway. It is considered that any potential increase in bus travel times is relatively minor when considered in the context of overall door-to-door travel times, where typical journeys are multi-modal (e.g. walking and bus; or walking, bus and train).

Bus place performance is not expected to change as the proposal does not include changes to bus stop facilities. However, safety and connectivity for bus customers accessing the relocated northbound and southbound bus stops at Princes Highway at/opposite Short Street would be improved due to the new signalised pedestrian crossing on Princes Highway at Short Street.

Accessibility to St Peters Station would be improved due to improved pedestrian and cyclist connectivity as described above.

Road safety

The proposal would increase the number of formal crossing opportunities, widen footpaths, improve landscaping and add a new segregated cycleway which would improve safety outcomes for pedestrians and cyclists. Additional formal crossing opportunities are proposed at the following locations:

- Signalised pedestrian crossing on Princes Highway at Short Street
- Signalised shared crossing on King Street between May Street and Goodsell Street
- Signalised pedestrian crossing on Princes Highway at Barwon Park Road

The above crossings would improve safety by reducing the distance between formal crossing opportunities and reducing the number of pedestrians and cyclists crossing King Street, Princes Highway and Sydney Park Road at unsafe locations. Furthermore, additional signalised pedestrian crossings are proposed across the western leg of the Mitchell Road / Sydney Park Road intersection and on the northern leg of the King Street / Sydney Park Road intersection (replacing the unsignalised pedestrian crossing across the southbound left-turn slip lane), which would also improve safety for pedestrians and cyclists.

Footpath widening is proposed along the following sections:

- Western side of King Street/Princes Highway between Goodell Street and south of May Street
- \ Western side of Mitchell Road from the intersection of Sydney Park Road to the Sydney Park Village entrance
- Both sides of Sydney Park Road from the King Street/Princes Highway for approximately 150m.

Widened footpaths and landscaping works would increase separation between pedestrians and traffic and discourage pedestrians from crossing at unsafe locations. Similarly, a two-way on-road segregated cycleway is proposed on the northern side of Sydney Park Road as well as on the western side of King Street between May Street and St Peters square, that would separate cyclists from traffic and discourage cyclists from crossing at unsafe locations.

The proposal would reduce traffic volumes and speed limits on King Street, Princes Highway and Sydney Park Road, which would reduce the likelihood of crashes on these roads. The proposal would also reduce the volume of heavy vehicles on these roads, which would potentially reduce the severity of crashes. A reduction in the likelihood and severity of crashes would lead to a reduction in FSI and casualty crash rates.

Cumulative impacts

The cumulative operation impacts of nearby developments or planned projects have been summarised qualitatively in Section 6.11.1 and would include:

- Altered traffic patterns in the proposal area, with Euston Road and Campbell Street/Campbell Road replacing Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo
- Improved traffic flow, road safety and trip reliability along the nearby Alexandria to Moore Park corridor
- Increased demand for travel across all customer modes in and near the proposal area.

6.1.5 Safeguards and management measures

The majority of long-term impacts of the proposal have been addressed during the design process and include:

- Provision for pedestrians and cyclists by maintaining or improving existing pedestrian and cyclist infrastructure within the footprint of the proposal
- Management of capacity constraints to be addressed through the operation of existing traffic signals and other road network treatments.

Other impacts, including short-term impacts that would arise from construction activities, would be managed with the safeguards and management measures specified in this section.

Impact	Environmental safeguards	Responsibility	Timing	Reference
Traffic and transport	Prepare and implement a Traffic Management Plan (TMP) in accordance with the Transport for NSW *Traffic Control at Work Sites Manual* (RTA, 2010) and *QA Specification G10 Traffic Management* (Transport for NSW, 2020) as part of the CEMP. The TMP should include: • Confirmation of haulage routes • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • Monitoring, review and amendment mechanisms.	Contractor	Detailed design / Pre-construction	Core standard safeguard TT1 Section 2.2 of QA *G10 Traffic Management*
Local community notification	Undertake consultation with potentially affected residences prior to the commencement of and during works in accordance with the Transport for NSW's Community Involvement and Communications Resource Manual. Consultation should include but not be limited to door knocks, newsletters or letter box drops providing information on the proposal, working hours and a contact name and number for more information or to register complaints.	Transport for NSW	Pre-construction/construction	Core standard safeguard TT2

Impact	Environmental safeguards	Responsibility	Timing	Reference
Access	Maintain access to properties during construction. Where that is not possible or necessary, provide temporary alternative access arrangements in consultation with affected landowners and the relevant local road authority.	Contractor	Pre-construction/construction	Additional standard safeguard TT3
Impacts to pedestrians and cyclists	Maintain pedestrian and cyclist access throughout construction. Where that is not possible or necessary, provide temporary alternative access arrangements in consultation with affected landowners and the local road authority.	Contractor	Construction	Additional standard safeguard TT4
Community information	Provide road users and local communities with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.	Contractor	Construction	Additional standard safeguard TT5
Public transport network changes during construction	Maintain access for public transport services. Consult with bus operators, Transport for NSW, the City of Sydney Council and Inner West Council (as relevant), and inform the community of any temporary changes to bus stop operation.	Contractor	Construction	Additional standard safeguard TT6
General traffic and freight performance during construction	Undertake ongoing consultation with Transport Coordination, City of Sydney Council, Inner West Council, emergency services and bus operators to minimise transport and traffic impacts during construction.	Contractor	Construction	Additional standard safeguard TT7
General traffic and freight performance during construction	Implement a variable message sign strategy to encourage through and regional traffic to use Euston Road and Campbell Street / Campbell Road instead of Princes Highway and Sydney Park Road.	Contractor	Construction	Additional standard safeguard TT8
General traffic and freight performance during construction	Minimise construction vehicle movements during peak periods.	Contractor	Construction	Additional standard safeguard TT9
Safety around construction site accesses	Manage vehicle access to and from construction sites to ensure pedestrian, cyclist and driver safety. This may require manual supervision, physical barriers and / or temporary traffic control.	Contractor	Construction	Additional standard safeguard TT10
Construction personnel parking	Provide construction personnel parking at compound sites, so parking on local streets is kept to a minimum.	Contractor	Construction	Additional standard safeguard TT11

Impact	Environmental safeguards	Responsibility	Timing	Reference
General traffic and freight performance during operation	Undertake an operational traffic review to confirm the operational traffic impacts of the proposal on the surrounding road network. This review would be undertaken as part of the ongoing post-opening operational traffic review that has been committed to as part of the WestConnex Stage 2 project.	Transport for NSW	Operation	Additional standard safeguard TT12
General traffic and freight performance during operation	Undertake ongoing network optimisation using the existing traffic signal control system (SCATS) by minimising intersection and midblock delays to ensure that travel time savings are achieved to the greatest possible extent.	Transport for NSW	Operation	Additional standard safeguard TT13

6.2 Noise and vibration

An assessment was carried out to identify the extent and magnitude of potential noise and vibration impacts associated with the proposal. The assessment is documented in the Sydney Park Junction Noise and Vibration Assessment (Noise and Vibration Assessment) (SLR, 2021), which is provided in Appendix D. A summary of the assessment is presented in this section, together with safeguards and management measures to mitigate any negative impacts.

6.2.1 Methodology

The methodology for the noise and vibration assessment included the following:

- Identifying noise and vibration sensitive receivers in the area around the proposal using aerial photography and publicly available online databases.
- Establishing noise and vibration assessment criteria
- Modelling predicted construction and operational noise levels
- Assessing predicted noise and vibration levels against the relevant criteria to identify potential impacts
- Identify safeguards and management measures to be implemented to minimise impacts.

The noise and vibration assessment has been prepared in accordance with the following guidelines and standards:

- *Construction Noise and Vibration Guideline* (CNVG) (Roads and Maritime, 2016)
- *Interim Construction Noise Guideline* (ICNG) (DECC, 2009)
- *Road Noise Policy* (RNP) (DECCW, 2011)
- *Noise Criteria Guideline* (NCG) (Roads and Maritime, 2015)
- British Standard *BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2* (BSI, 1993)
- *DIN 4150: Part 3-1999 Structural vibration - Effects of vibration on structures* (Deutsches Institute fur Normung, 1999).
- *Assessing Vibration: a technical guideline* (DEC, 2006)
- *AS2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors*
- Australian Standard *AS1055 – 1997 Acoustics – Description and measurement of environment noise, Part 2: Application to specific situations*.

Minor works are defined in the *Noise Criteria Guideline* (RMS, 2015) as works which are primarily to improve safety. The proposal is considered minor works.

Prediction of construction noise levels at sensitive receivers was modelled using the SoundPLAN (Version 8.0) noise modelling software. This three-dimensional model accounts for noise source and receiver locations, ground and air absorption as well as any acoustic screening provided by intervening topography and buildings. The construction noise assessment considered noise activities.

Operational traffic noise levels were modelled for the following future year scenarios:

- Year of opening (2023) with the proposal
- 10 years after opening (2033) with the proposal.

Modelling was based on the traffic volumes for the same assessment scenarios as outlined in the Traffic and Transport Assessment (Jacobs, 2021) (refer to Appendix C). The model was validated based on the noise monitoring results, as well as the results of traffic count surveys carried out concurrently with the long-term unattended noise monitoring.

6.2.2 Existing environment

Sensitive receivers

The proposal is surrounded by a mix of commercial and residential sensitive receivers. Directly to the north of the proposal, along the northern side of Sydney Park Road, there are several residential apartment buildings between King Street and Euston Road. To the east of the proposal along Euston Road, receivers are predominantly of commercial use. Along King Street/Princes Highway, between Campbell Road and Sydney Park Road, there are a mix of commercial and residential receivers. The proposal adjoins the western and northern boundaries of Sydney Park. The locality of nearby sensitive receivers is shown in Figure 6-10.

As it is not feasible to determine background noise levels for each receiver individually, noise monitoring has been carrying out for groups of receivers based on them having a common exposure to the same construction works. For the purpose of the noise assessment, receivers have been grouped into seven separate noise catchment areas (NCAs) based on the use of buildings nearby (e.g. residential/commercial) and logical boundaries. The NCAs are shown in Figure 6-10.

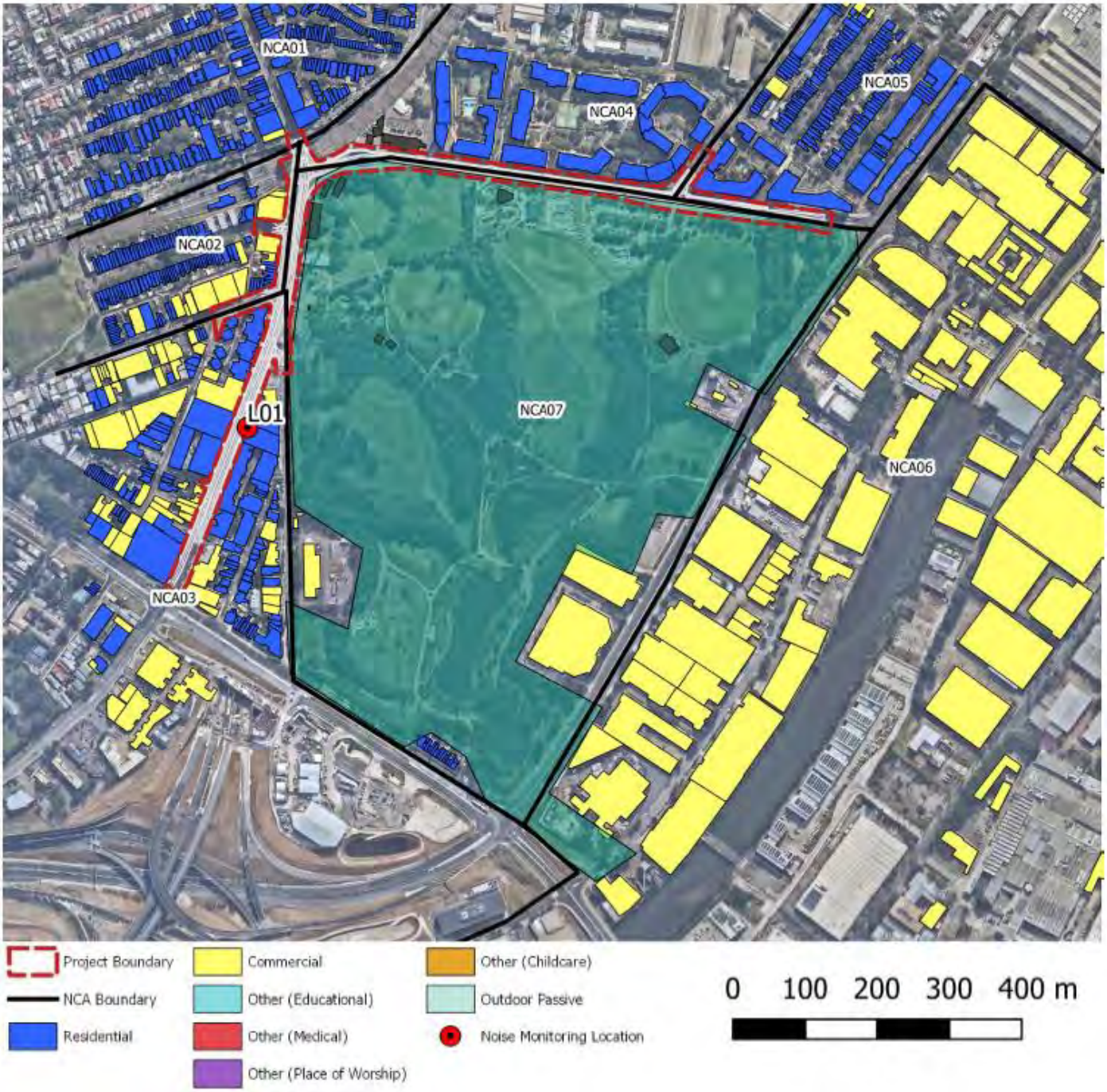

Figure 6-10 Sensitive receivers and noise catchment areas (NCAs) (SLR, 2021)

Existing noise environment

Unattended noise monitoring was completed in the study area in June 2021. The measured noise levels have been used to determine the existing noise environment, which is representative of the background noise levels at receivers which would likely be most affected by construction of the proposal across the project. These measured noise levels have also been used to set the criteria to assess the potential impacts from the proposal.

The noise monitoring equipment continuously measured existing noise levels in 15-minute periods during the daytime, evening and night-time. All equipment carried current National Association of Testing Authorities (NATA) calibration certificates and calibration was checked before and after each measurement. The results of the noise monitoring have been analysed to exclude noise from extraneous events and data affected by adverse weather conditions, such as strong wind or rain (taken from the Bureau of Meteorology weather station located at Sydney Airport), to establish representative existing noise levels for the project area.

The representative noise levels presented in Table 6-13 have been used to establish the noise management levels in the noise and vibration assessment.

Table 6-13 Representative background noise levels

Noise environment	Measured Noise Level (dBA)					
	Background Noise (RBL)			Average Noise (LAeq)		
	Day	**Evening**	Night	Day	Evening	Night
Urban/Industrial – Areas with dense transportation or some commerce or industry	54	52	42	70	69	67

6.2.3 Criteria

Construction hours

As described in Section 3.3, Transport for NSW would undertake construction during standard hours where it is feasible and reasonable to do. The standard construction hours are defined in the CNVG as:

- Monday – Friday: 7:00am to 6:00pm
- Saturday: 8:00am to 1:00pm
- No work on Sundays or Public holidays.

Periods outside of these standard hours are referred to as “Out of Hours (Works)” periods. The CNVG segregates “Out of Hours Works” periods into the following two bands according to the sensitivity of receivers to noise impacts:

- Out of Hours Works Period 1 (OOHW1): Monday - Saturday 6:00pm to 10:00pm, Saturday 7:00am to 8:00am and 1:00pm to 10:00pm, and Sundays and public holidays 8:00am to 6:00pm
- Out of Hours Works Period 2 (OOHW2): Monday - Friday 10:00pm to 7:00am, Saturday 10:00pm to 08:00am, and Sundays and public holidays 6:00pm to 7:00am.

Some works, such as works within the road median and utility relocations, would likely be undertaken out of hours, to ensure safe work practices and to avoid unacceptable traffic or utility disruptions.

Construction noise management levels

The potential noise impacts from construction activities have been assessed using a quantitative approach in accordance with the ICNG.

The ICNG contains procedures for establishing NMLs at sensitive receiver locations based on the existing background noise in the area. Where an exceedance of the noise management levels is predicted, the ICNG advises that receivers can be considered 'noise affected' and the proponent should apply all feasible and reasonable work practises to minimise the noise impact. The proponent should also inform all potentially impacted residents of the nature of the works to be carried out, the expected noise level and duration, as well as contact details.

Residential receivers

Table 6-14 details the method for determining NMLs for residential receivers potentially affected by the proposal. Often works that may cause inconvenience within the community (e.g. traffic congestion) or safety concerns are done outside of standard work hours. NMLs during these periods are presented in the table for works 'Outside recommended standard hours'.

Table 6-14 Recommended construction NMLs at residential receivers outlined in the ICNG

Time of day	Noise Management Level $L_{Aeq\ (15min)}$[1]	How to apply
Recommended Standard hours: **Monday to Friday 7:00am to 6:00pm** **Saturday 8:00am to 1:00pm** **No work on Sundays or public holidays**	Noise affected rating background level: RBL + 10 dB(A)	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practises to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected: 75 dBA	The Highly Noise Affected (HNA) level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restructuring the hours that the very noisy activities can occur, taking into account: Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected rating background level: RBL + 5 dB(A)	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practises have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

Note 1: LAeq (15 min) – the A-weighted equivalent continuous (energy average) A-weighted sound pressure level of the construction works under consideration over a 15-minute period and excludes other noise sources such as from industry, road, rail and the community.

Considering the rating background noise levels (RBLs) presented in Table 6-13 and the guidance from the ICNG in Table 6-14, the NMLs outlined in Table 6-15 have been established to assess the potential for noise impacts during construction.

Table 6-15 Construction NMLs at residential receivers established for proposal

Standard Hours Construction (RBL+10dB) – dB(A)	Out of Hours (RBL+5dB) – dB(A)			Sleep Disturbance – dB(A)
Daytime	Daytime	Evening	Night-time	
64	59	57	47	57

Non-residential receivers

A number of non-residential land uses have been identified in the study area. These include other sensitive land uses such as educational institutes, medical facilities, outdoor recreational areas and commercial properties. The ICNG also provides guidance for these types of receivers. Noise management levels recommended in the ICNG for non-residential receivers have been reproduced in Table 6-16. No separate criteria for out-of-hours construction works is provided for non-residential sensitive receivers as it is assumed that the buildings would be vacated during the evening and night time.

For certain receiver types, criteria presented in Table 6-16 is specified as an internal noise level. As the noise model predicts external noise levels, it has been conservatively assumed that all schools and places of worship have openable windows and external noise levels are 10 dB higher than the corresponding internal level, which is representative of windows being partially open to provide ventilation. Hospital wards are assumed to have fixed windows with 20 dB higher external levels.

Table 6-16 Recommended construction NMLs at non-residential receivers outlined in ICNG

Non-residential land use	Noise Management Level $L_{Aeq(15minute)}$[1] (when property is in use) – dB(A)
Classrooms at schools and other education institutions	45 (Internal noise level)
Hospital wards and operating theatres	45 (Internal noise level)
Places of Worship	45 (Internal noise level)
Active recreation areas	65 (External noise level)
Passive recreation areas	60 (External noise level)
Community centres	Refer to the recommended 'maximum' internal levels in AS 2107 for specific uses
Commercial (offices, retail outlets and small commercial premises)	70 (External noise level)

Note 1: LAeq (15 min) – the A-weighted equivalent continuous (energy average) A-weighted sound pressure level of the construction works under consideration over a 15-minute period and excludes other noise sources such as from industry, road, rail and the community.

Sleep disturbance

Construction activity during night periods (10:00pm-7:00am) has the potential to cause sleep disturbance in nearby residences. Where construction works are planned to extend over more than two consecutive nights, the ICNG recommends that an assessment of sleep disturbance impacts should be completed. The ICNG makes reference to the EPA's *Environment Criteria for Road Traffic Noise* (ECRTN), now superseded by the RNP, for assessment of sleep disturbance. The RNP references the recommendations in the ECRTN as providing the most appropriate assessment guidance.

The guidance provided in the RNP for assessing the potential for sleep disturbance recommends that to minimise the risk of sleep disturbance during the night-time period, the $L_{A1(1\ min)}$ noise level (the A-weighted sound pressure level that is exceeded for 1% of the 1-minute measurement period) outside a bedroom window should not exceed the $L_{A90(15\ min)}$ background noise level (the A-weighted sound pressure level that

is exceeded for 90% of the 15-minute measurement period, when measured in the absence of the construction works excluding extraneous noise) by more than 15 dB(A). If this sleep disturbance screening criterion is found to be exceeded, a more detailed assessment and response is required at the detailed design stage that should include the extent that the maximum noise level exceeds the background noise level and the number of times this is likely to happen during the night-time period.

Construction vibration criteria

Vibration arising from construction activities can result in impacts on human comfort, impacts on the building contents (such as sensitive equipment) or the damage to the physical structure of the building. These impacts have different criteria levels, with the effects of vibration on human comfort having a lower threshold.

Human comfort

Assessing Vibration: a technical guideline identifies three different forms of vibration associated with construction activities:

- Continuous: uninterrupted vibration occurring over a defined period.
- Impulsive: short-term (typically less than two seconds) bursts of vibration which occurs up to three times over an assessment period.
- Intermittent: interrupted periods of continuous or repeated impulsive vibration, or continuous vibration that varies significantly in magnitude.

Vibration from construction works tends to be intermittent in nature. *Assessing Vibration: a technical guideline* provides criteria for intermittent vibration based on the Vibration Dose Value (VDV). The 'preferred' and 'maximum' VDVs for human comfort impacts are shown in Table 6-17 and Table 6-18.

Table 6-17 Preferred and maximum values for intermittent vibration (DECC, 2006)

Building type	Assessment Period	Vibration Dose Value[1] ($m/s^{1.75}$)	
		Preferred	Maximum
Critical Working Areas (eg operating theatres or laboratories)	Day or night-time	0.10	0.20
Residential	Daytime	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational institutions and places of worship	Day or night-time	0.40	0.80
Workshops	Day or night-time	0.80	1.60

Note 1: The VDV accumulates vibration energy over the daytime and night-time assessment periods, and is dependent on the level of vibration as well as the duration.

Table 6-18 Preferred and maximum values for continuous and impulsive vibration (DECC, 2006)

Location	Assessment Period	Preferred values (m/s^2) 1–80 Hz		Maximum values (m/s^2) 1–80 Hz	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Continuous vibration					
Critical working areas[1] (eg operating theatres or precision laboratories where sensitive operations are occurring)	Day or night-time	0.0050	0.0036	0.010	0.0072
Residential	Daytime	0.010	0.0071	0.020	0.014

Location	Assessment Period	Preferred values (m/s^2) 1–80 Hz		Maximum values (m/s^2) 1–80 Hz	
		z-axis	x- and y-axis	z-axis	x- and y-axis
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
Workshops	Day or night-time	0.04	0.029	0.080	0.058
Impulsive vibration					
Critical working areas[1] (eg operating theatres or precision laboratories where sensitive operations are occurring)	Day or night-time	0.0050	0.0036	0.010	0.0072
Residential	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Note 1: No critical working areas have been identified in the study area. This should be confirmed during the detailed design stage.

Building contents

For most receivers, the human comfort vibration criteria are the most stringent and it is generally not necessary to set separate criteria for vibration effects on typical building contents. Exceptions to this can occur when vibration sensitive equipment, such as electron microscopes and microelectronics manufacturing equipment, are located in buildings near the construction works. Buildings with vibration sensitive equipment have not been identified near the proposal.

Buildings and structures

If vibration from construction works is sufficiently high it can cause damage to structural elements of affected buildings such as cracks or loosening of drywall surfaces, cracks in supporting columns and loosening of joints. Structural damage vibration limits are contained in British Standard (BS) 7385 and German Standard DIN 4150.

The BS 7385 is used as a guide to assess the likelihood of building damage from ground vibration such as that caused by piling, compaction, construction equipment and road and rail traffic. The standard recommends levels at which ‘cosmetic’, ‘minor’ and ‘major’ categories of damage might occur based on the type of structure affected, using the peak particle velocity (PPV) parameter. The criteria are presented in Table 6-19.

Table 6-19 BS 7385 structural damage criteria

Group	Type of structure	Damage level	Peak particle velocity (PPV) – millimetre per second (mm/s)	
			4Hz to 15Hz	15Hz and above
1	Reinforced or framed structures. Industrial and heavy commercial buildings	Cosmetic	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures. Residential or light commercial type buildings	Cosmetic	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

For heritage buildings, the BS 7385 states that "*a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive*".

Guidance for more sensitive structures, such as residential buildings and buried pipework, is presented in the German Guideline DIN 4150. The DIN 4150 values for buildings and structures are shown in Table 6-20. As stated in BS 7385, heritage buildings and structures should not be assumed to be more sensitive to vibration, unless structurally unsound. Where a heritage building is deemed to be sensitive, the more stringent DIN 4150 Group 3 guideline values in Table 6-20 can be applied.

Table 6-20 DN4150 vibration guidelines for heritage buildings

Group	Type of structure	Guideline value for velocity - mm/s				
		Foundation, All Directions at a Frequency of			Topmost Floor, Horizontal	Floor Slabs, Vertical
		1 to 10 Hz	10 to 50 Hz	50 to 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
3	Structures that, because of their particular sensitivity to vibration, cannot be classified as Group 1 or 2 and are of great intrinsic value (e.g. heritage listed buildings)	3	3 to 8	8 to 10	8	20[1]

Minimum working distances

The CNVG provides minimum working distances to achieve human comfort criteria (from the NSW EPA Vibration Guideline) and cosmetic building damage criteria (from BS 7385 and DIN 4150) for a range of different plant and equipment. These have been reproduced in Table 6-21. Impacts on human comfort and the physical structure of buildings are considered unlikely at distances greater than the minimum working distances.

The construction activities listed in Table 6-21 occur at various stages in each construction zone as described in Section 3.3.1. As the final construction methodology and staging is refined further, the associated noise and vibration impacts, and associated safeguards and management measures, would be re-assessed as required.

Table 6-21 Recommended safe working distances for vibration-intensive plant and equipment (Roads and Maritime Services, 2016)

Plant	Rating/description	Minimum distance (metres)		
		Cosmetic damage		Human Response (NSW EPA Guideline)
		Residential and Light Commercial (BS 7385)	Heritage Items (DIN 4150, Group 3)	
Vibratory roller	<50 kN (1–2 tonne)	5	11	15 - 20
	<100 kN (2–4 tonne)	6	13	20
	<200 kN (4–6 tonne)	12	15	40
	<300 kN (7–13 tonne)	15	31	100
	>300 kN (13–18 tonne)	20	40	100
	>300 kN (>18 tonne)	25	50	100
Small Hydraulic Hammer	300 kg (5 to 12 t excavator)	2	5	7
Medium Hydraulic Hammer	900 kg (12 to 18 t excavator)	7	15	23
Large Hydraulic Hammer	1,600 kg (18 to 34 t excavator)	22	44	73
Vibratory Pile Driver	Sheet piles	2 - 20	5 - 40	20
Piling Rig – Bored	≤ 800	2 (nominal)	5	4
Jackhammer	Hand held	1 (nominal)	3	2

The minimum working distances are indicative and will vary depending on the particular item of equipment, the scope of the work and local geotechnical conditions.

Construction noise mitigation

The CNVG contains a number of standard mitigation measures for mitigating and managing construction impacts. The measures are shown in Appendix B of the Noise and Vibration Assessment and should be applied to the works where feasible and reasonable.

Where noise impacts remain after the use of standard mitigation measures, the CNVG requires the use of additional mitigation measures where feasible and reasonable. The trigger levels for implementing additional mitigation measures defined in the CNVG are shown in Table 6-22.

Table 6-22 CNVG triggers for additional mitigation measures – airborne noise (Roads and Maritime, 2016)

Predicted $L_{Aeq(15minute)}$ Airborne Noise Level at Receiver			Additional Mitigation Measures	
Perception	dBA above RBL	dBA above NML	Type[1]	Mitigation Levels[2]
All hours				
75 dBA or greater			N, V, PC, RO	HNA
Standard Hours: Mon – Fri (7am – 6pm), Sat (8am – 1pm), Sun/Public Holiday (No work)				
Noticeable	5 to 10	0	-	NML
Clearly Audible	10 to 20	<10	-	NML
Moderately Intrusive	20 to 30	10 to 20	N, V	NML+10
Highly Intrusive	>30	>20	N, V	NML+20

Predicted $L_{Aeq(15minute)}$ Airborne Noise Level at Receiver			Additional Mitigation Measures	
Perception	dBA above RBL	dBA above NML	Type[1]	Mitigation Levels[2]
OOHW Period 1: Mon – Fri (6pm – 10pm), Sat (7am – 8am & 1pm – 10pm), Sun/Public Holiday (8am – 6pm)				
Noticeable	5 to 10	<5	-	NML
Clearly Audible	10 to 20	5 to 15	N, R1, DR	NML+5
Moderately Intrusive	20 to 30	15 to 25	V, N, R1, DR	NML+15
Highly Intrusive	>30	>25	V, IB, N, R1, DR, PC, SN	NML+25
OOHW Period 2: Mon – Fri (10pm – 7am), Sat (10pm – 8am), Sun/Public Holiday (6pm – 7am)				
Noticeable	5 to 10	<5	N	NML
Clearly Audible	10 to 20	5 to 15	V, N, R2, DR	NML+5
Moderately Intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR	NML+15
Highly Intrusive	>30	>25	AA, V, IB, N, PC, SN, R2, DR	NML+25

Note 1: N = Notification, SN = Specific Notification, PC = Phone Calls, IB = Individual Briefings, R1 = Respite Period 1, R2 = Respite Period 2, RO = Project Specific Respite Offer, DR = Duration Respite, AA = Alternative Accommodation, V = Verification.

Note 2: NML = Noise Management Level, HNA = Highly Noise Affected (ie 75 dBA or greater for residential receivers).

Operational noise

Under the RNP, road development is either classified as a “new road” or a “redevelopment of an existing road”. The proposal is not considered a redevelopment of an existing road or a new road as it is not intended to increase the traffic carrying capacity of the overall road or accommodate a significant increase in heavy vehicle traffic. As such the noise thresholds for residential receivers during operation of the proposal are adopted from the criteria listed in Table 6-23.

Table 6-23 Operational noise criteria for residential receivers

Existing road category	Target Noise Level dB(A)[1]	
	Day-time (7am - 10pm)	Night-time (10pm – 7am)
Freeway/arterial/sub-arterial road	$L_{Aeq(15hour)}$ 60	$L_{Aeq(9hour)}$ 55

Note 1: All criteria are external, applicable at the facade of the affected residence.

The NCG provides three triggers where a receiver may qualify for consideration of noise mitigation (beyond the adoption of road design and traffic management measures). The triggers are:

- Trigger 1: The predicted Build noise level exceeds the NCG controlling criterion and the noise level increase due to the project (i.e. the noise predictions for the Build minus the No Build) is greater than 2 dB(A)
- Trigger 2: The predicted Build noise level is 5 dB(A) or more above the criteria (exceeds the cumulative limit) and the receiver is significantly influenced by project road noise, regardless of the incremental impact of the project
- Trigger 3: The noise level contribution from the road proposal is “acute”, which is to say, at least 65 $dB(A)_{Leq,15hour}$ during daytime periods or at least 60 $dB(A)_{Leq,15hour}$ during night periods) then it qualifies for consideration of noise mitigation even if noise levels are dominated by another road.

Note that these criteria do not prescribe that a receiver shall receive mitigation necessarily, as there are matters of the “feasibility and reasonableness” of the safeguards and management measures to consider in

addition. The eligibility of receivers for consideration of additional noise mitigation is determined before the benefit of additional noise mitigation (quieter pavement and noise barriers) is included. The requirement for the proposal is to provide reasonable and feasible additional mitigation for these eligible receivers to meet the NCG controlling criterion. If the NCG criterion cannot be satisfied with safeguards and management measures such as quieter pavement and noise barriers, then the receiver is eligible for consideration of at-property treatment.

6.2.4 Potential impacts

Construction noise

The proposal would be constructed in two main construction zones over approximately 24 months from middle 2021 to middle 2023.

Construction activities

The activities likely to be required to construct the proposal involve conventional road infrastructure construction equipment such as rock breakers, concreting equipment and small cranes. Overall sound power levels (SWLs) were predicted for the main construction activities associated with the proposal. These were determined based on expected worst-case sequencing of plant and equipment. Table 6-24 summarises estimated overall noise emissions for each construction assessment scenario.

Table 6-24 Proposed typical construction activities and sound power levels

Construction activity	Overall sound power level (SWL) – dB(A)	Hours of Works			
		Standard Daytime Hours	Daytime OOH[1]	Evening	Night-time
Mobilisation and site establishment	107	✓			
Traffic switches	116	✓	✓	✓	✓
Tree felling	117	✓		✓	✓
Utility locating	116	✓		✓	✓
Utility relocation (noisy works)	117	✓	✓	✓	✓
Utility relocation	108	✓	✓	✓	✓
Drainage infrastructure	115	✓	✓	✓	✓
Road works – general civil	119	✓	✓	✓	✓
Road works – milling works	119	✓	✓	✓	✓
Paving works – pavement works	118	✓	✓	✓	✓
Finishing works	113	✓	✓	✓	✓

Note 1: OOH = Out of hours. During the daytime this refers to the period on Saturday between 7:00am – 8:00am and 1:00pm – 6:00pm, on Sunday and public holidays between 8:00am – 6:00pm.

Residential receivers

The CNVG outlines the predicted noise impacts for residential receivers based on the exceedance of the NML, as shown in Table 6-25.

Table 6-25 Noise impacts for residential receivers based on NML exceedances

CNVG noise perception categories	Exceedance above NML $L_{Aeq\ (15min)}$ - dB	
	Daytime – Standard hours	Out of Hours
Noticeable	- [1]	1 - 5
Clearly audible	< 10	6 - 15
Moderately intrusive	11 - 20	16 - 25
Highly intrusive	>20	>25

Note 1: Applicable for noise levels of 5-10 dB above RBL.

Construction noise impacts were predicted to the receiver locations surrounding the proposal by modelling the noise sources, receiver locations and construction activities as outlined above. Predicted noise level ranges determined for each construction activity represent all plant items operating concurrently at the closest distance to receivers. This approach is conservative and has been adopted to ensure the full extent of possible noise impacts are assessed (i.e. worst-case scenario and is based on the noisiest activities – utility relocation and civil works occurring concurrently).

The number of receivers where construction noise levels are predicted to exceed NMLs during the loudest construction activities are detailed in Appendix B of the Noise and Vibration Assessment (Appendix D). Predicted worst-case noise exceedances at residential receivers in construction zones A and B are summarised in Table 6-26 and Table 6-27 respectively. Noticeable noise exceedances are indicated in blue, clearly audible exceedances are indicated in green, moderately intrusive exceedances are indicated in orange and highly intrusive exceedances are indicated in purple. White shading indicates no noticeable noise exceedances and grey shading indicates no work during that period.

The day, evening and night construction noise management levels would generally be exceeded at most residential receivers in each NCA. Highly intrusive noise impacts are generally limited to residential receivers closest to the proposal and directly next to the construction works, i.e. receivers in NCA01, NCA02 and NCA03 in construction zone A and receivers in NCA04 and NCA05 in construction zone B. Whilst the works are intrusive, works would progress along the road and as such the duration of the noise impacts would be expected to be relatively short at a specific receiver location. The use of noise intensive equipment, such as concrete saws and rock breakers, would generally be limited to sporadic short periods. Receivers which are further away from the works and/or shielded from view would have substantially lower impacts.

Residential receivers closest to the proposal and directly next to the construction works are also predicted to be Highly Noise Affected, i.e. experience noise levels over 75dB(A) during the day period. The number of receivers which could potentially be Highly Noise Affected during the worst-case impacts from the proposal are summarised in Table 6-28 and shown in Figure 6-11. The predictions assume the worst-case scenarios are occurring at all locations and therefore present all the potentially Highly Noise Affected receivers over the construction period.

In most cases, the exceedances of the NMLs and highly noise affected level of 75dB(A) are based on the activity occurring at a point nearest to the receiver and with all plant and equipment operating concurrently. However, not all plant and equipment would typically operate concurrently and the use of noise intensive equipment would generally be limited to sporadic short periods.

Specific safeguards and management measures such as mobile plant screening (temporary noise barriers) and limiting the use of noise intensive equipment to before midnight would help mitigate noise levels and associated impacts. These specific safeguards and management n measures should be specifically employed when works are conducted outside of standard hours.

Other sensitive receivers

Other sensitive receivers identified near the proposal are limited to public buildings within Sydney Park and Sydney Park itself, which is classified as a passive recreational area. NML exceedances greater than 25 dB(A) are predicted when works are within close proximity to Sydney Park buildings, although noise levels across the general park area would only be approximately 5 dB above the NML daytime criteria of 60

dB(A). As mentioned before, the predicted impacts are based on all equipment working simultaneously in each assessed scenario. There would frequently be periods when construction noise levels are much lower than the worst-case predictions and there would be times when no equipment is in use and no exceedances occur.

Sleep disturbance

Exceedances of the sleep disturbance "screening criterion" is likely when night works occur near residential receivers. The receivers which would potentially be affected by sleep disturbance impacts are generally the same receivers where "Highly Intrusive" night-time impacts have been predicted. The number of receivers predicted to experience exceedances of sleep disturbance impacts are shown in Appendix B of the Noise and Vibration Assessment (Appendix D).

Table 6-26 Predicted worst-case construction noise exceedances at residential receivers in construction Zone A (Princes Highway/King Street – Campbell Street to Sydney Park Road)

Scenario	NCA01	NCA02	NCA03	NCA04	NCA05	NCA06	NCA07
Daytime							
Mobilisation and site establishment							
Traffic switches							
Tree felling							
Utility locating							
Utility relocation (noisy works)							
Utility relocation							
Drainage infrastructure							
Road works – general civil							
Road works – milling works							
Paving works – pavement works							
Finishing works							
Evening							
Mobilisation and site establishment							
Traffic switches							
Tree felling							
Utility locating							
Utility relocation (noisy works)							
Utility Relocation							
Drainage infrastructure							
Road works – general civil							
Road works – milling works							
Paving works – pavement works							
Finishing works							
Night							
Mobilisation and site establishment							
Traffic switches							
Tree felling							
Utility locating							
Utility relocation (noisy works)							
Utility Relocation							

Scenario	NCA01	NCA02	NCA03	NCA04	NCA05	NCA06	NCA07
Drainage infrastructure							
Road works – general civil							
Road works – milling works							
Paving works – pavement works							
Finishing works							

Table 6-27 Predicted worst-case construction noise exceedances at residential receivers in construction Zone B (Sydney Park Road – King Street to Euston Road)

Scenario	NCA01	NCA02	NCA03	NCA04	NCA05	NCA06	NCA07
Daytime							
Mobilisation and site establishment							
Traffic switches							
Tree felling							
Utility locating							
Utility relocation (noisy works)							
Utility Relocation							
Drainage infrastructure							
Road works – general civil							
Road works – milling works							
Paving works – pavement works							
Finishing works							
Evening							
Mobilisation and site establishment							
Traffic switches							
Tree felling							
Utility locating							
Utility Relocation (noisy works)							
Utility Relocation							
Drainage infrastructure							
Road works – general civil							
Road works – milling works							
Paving works – pavement works							
Finishing works							
Night							
Mobilisation and site establishment							
Traffic switches							
Tree felling							
Utility locating							
Utility relocation (noisy works)							
Utility Relocation							
Drainage infrastructure							

Scenario	NCA01	NCA02	NCA03	NCA04	NCA05	NCA06	NCA07
Road works – general civil							
Road works – milling works							
Paving works – pavement works							
Finishing works							

Table 6-28 Predicted number of night-time Highly Noise Affected residential receivers in construction zones A and B

	Total count of night-time Highly Noise Affected receivers						
Scenario	NCA01	NCA02	NCA03	NCA04	NCA05	NCA06	NCA07
Zone A: Princes Highway – Campbell Street to Sydney Park Road							
Mobilisation and Site Establishment	-	7	11	-	-	-	-
Traffic switches	1	13	13	-	-	-	-
Tree Felling	1	13	13	-	-	-	-
Utility Locating	1	13	13	-	-	-	-
Utility relocation (Noisy works)	1	13	13	-	-	-	-
utility relocation	-	8	12	-	-	-	-
Drainage infrastructure	1	13	13	-	-	-	-
Road works – General Civil	3	13	14	-	-	-	-
Road works – Milling works	3	13	14	-	-	-	-
Paving Works – Pavement works	1	13	13	-	-	-	-
Finishing works	-	12	12	-	-	-	-
Zone B: Sydney Park Road – King Street to Euston Road							
Mobilisation and Site Establishment	-	-	-	3	-	-	-
Traffic switches	-	-	-	7	2	-	-
Tree Felling	-	-	-	7	2	-	-
Utility Locating	-	-	-	7	2	-	-
Utility relocation (Noisy works)	-	-	-	7	2	-	-
utility relocation	-	-	-	5	1	-	-
Drainage infrastructure	-	-	-	7	2	-	-
Road works – General Civil	1	-	-	7	2	-	-
Road works – Milling works	1	-	-	7	2	-	-
Paving Works – Pavement works	1	-	-	7	2	-	-
Finishing works	-	-	-	7	2	-	-

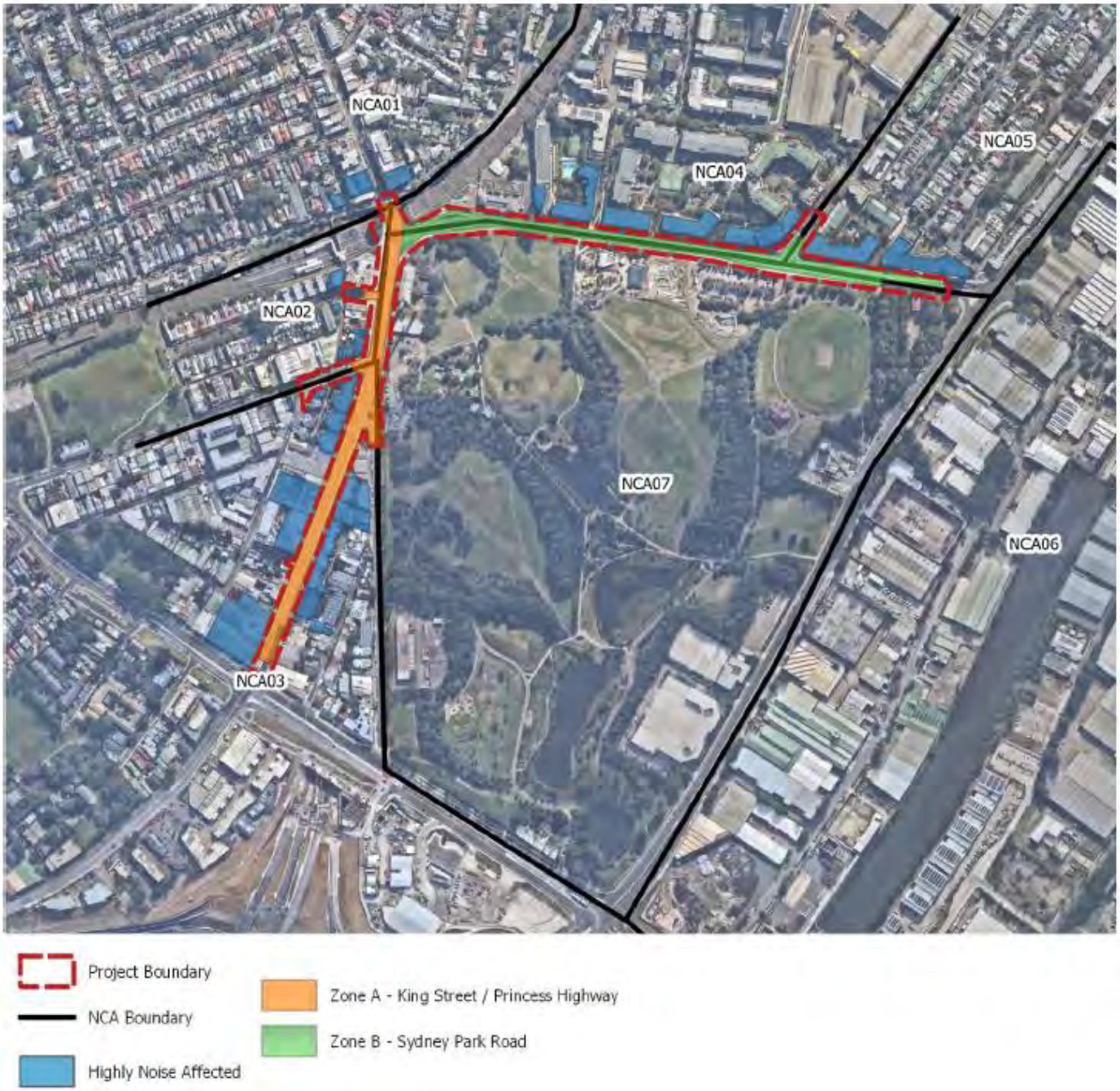

Figure 6-11 Highly Noise Affected receivers in construction zones A and B

Construction noise mitigation

A CNVMP would be prepared prior to works commencing which would detail the approach to providing mitigation during construction. The CNVMP would include standard mitigation measures as outlined in the CNVG. The requirement for additional mitigation measures specified by the CNVG (refer to Section 0) would be evaluated as the proposal progresses and detailed construction scheduling information becomes available.

Construction vibration

The main potential sources of vibration during construction would be from vibratory rollers used during road works and utility relocation.

Based on the relevant guidelines, the recommended safe working distances for typical items of vibration intensive plant are outlined in Table 6-21. Minimum working distances for a medium vibratory roller (<300 kilonewton (7 to 13 tonnes)) is shown in Figure 6-12. Where larger items of plant are required, such as a large vibratory roller, the minimum distances would be as per the distances outlined in Table 6-21 .

Figure 6-12 Recommended minimum working distances for a medium vibratory roller (SLR, 2021)

As shown in Figure 6-12, numerous buildings and receivers are located within the recommended minimum working distances. Where vibration-generating plant are operated within the minimum working distances, there is the potential for cosmetic building damage and/or human comfort impacts. Where impacts are perceptible by receivers, they would likely only be apparent for relatively short durations while equipment such as vibratory rollers are operated nearby.

Vibration would need to be managed to minimise disturbance to building occupants and avoid damage to buildings and other structures. The use of less vibration intensive methods of construction or equipment would be considered where feasible and reasonable when working in proximity to existing structures. Equipment would be selected to maintain the minimum working distances listed in Table 6-21. Equipment would be maintained and operated in an efficient manner, in accordance with manufacturer's specifications, to reduce the potential for adverse vibration impacts.

If it is expected that the minimum working distances are to be encroached at any location during the works, vibration monitoring is recommended to determine site specific minimum working distances during initial works. Attended vibration measurements would be undertaken at these locations at the start of the works to determine the risk of exceeding the vibration criteria and to confirm the minimum working distances.

Building condition surveys would be undertaken before and after vibration-intensive works on all properties and structures within the minimum working distances. The surveys would identify any existing damage and damage due to the construction works.

The SOHI prepared for the proposal (provided in Appendix E) identified a number of heritage items within the study area. Heritage buildings that are within the minimum working distances for DIN 4150 Group 3 for a medium size vibratory roller or medium sized rock breaker, and therefore has the potential to be impacted by vibration, include:

- St Peters Railway Station Group
- Electricity Substation No. 549
- Goodsell Estate Heritage Conservation Area
- St Peters Hotel, including interiors
- Former Brickworks Group
- King Street and Enmore Road Heritage Conservation area
- Former St Peters Theatre Façade
- King Street Heritage Conservation Area.

BS 7385 states that buildings or structures should not be assumed to be sensitive to vibration on the basis of being classed a heritage item. Heritage buildings are to be considered on a case by case basis and further investigations would be carried out during detailed design for all potentially affected structures. Where buildings or structures are considered sensitive to vibration, a dilapidation survey should be carried out to confirm the sensitivity of the item to vibration induced damage and the appropriate vibration criteria.

Construction traffic

The proposal would generate up to 20 heavy vehicle movements and 60 light vehicle movements per day across the proposal area during peak construction days. It is assumed that traffic associated with the construction of the proposal would use Euston Road and Campbell Road/Campbell Street as routes to and from the construction site.

Based on the existing traffic volumes along Princes Highway, King Street and Sydney Park Road, and the estimated construction traffic movements and the traffic volumes for the proposal, an increase in traffic noise greater than 2 dB along these roads during construction of the proposal is not considered likely. Therefore, noise from construction traffic would be well within the requirements of the CNVG.

Construction traffic noise impacts should be confirmed during the preparation of the CNVMP as part of the detailed design stage when the final construction scheduling is determined.

Operational noise

The proposal would reduce the capacity of King Street, Princes Highway and Sydney Park Road to improve pedestrian and cyclist infrastructure in the proposal area.

As a result of the improvements, residual traffic noise impacts from the redistributed traffic are expected along the following roads:

- Princes Highway/King Street
- Sydney Park Road
- Campbell Road/Campbell Street
- Euston Road
- Mitchell Road
- Huntley Street.

The predicted change in noise levels along sections of these roads, due to the change in traffic volumes predicted for 2023 (year of opening) and 2033 (10 years after opening) (detailed in Section 0), are outlined in Table 6-29. Increases in traffic noise are shown in grey shading.

Table 6-29 Predicted operational noise levels (2021 and 2031)

Road section	Increase in L_{Aeq} (dBA)			
	2021		2031	
	Day 15hr	Night 9 hr	Day 15hr	Night 9 hr
King Street, north of Sydney Park Road Northbound	-1.4	-1.4	-0.2	-0.2
King Street, north of Sydney Park Road Southbound	-0.4	-0.4	-1.6	-1.6
Princes Highway, between Sydney Park Road and May Street Northbound	-2.1	-2.1	-5.1	-5.1
Princes Highway, between Sydney Park Road and May Street Southbound	-2.0	-2.0	-3.8	-3.8
Princes Highway, between May Street and Campbell Street Northbound	-2.9	-2.9	-2.2	-2.2
Princes Highway, between May Street and Campbell Street Southbound	-2.6	-2.6	-4.5	-4.5
Sydney Park Road, between Euston Road and Mitchell Road Eastbound	-0.3	-0.3	-0.3	-0.3
Sydney Park Road, between Euston Road and Mitchell Road Westbound	-0.6	-0.6	-0.7	-0.7
Sydney Park Road, between Mitchell Road and King Street / Princes Highway Eastbound	-2.0	-2.0	-1.8	-1.8
Sydney Park Road, between Mitchell Road and King Street / Princes Highway Westbound	-2.5	-2.5	-3.2	-3.2
Mitchell Road, north of Sydney Park Road Northbound	-0.9	-0.9	-1.0	-1.0
Mitchell Road, north of Sydney Park Road Southbound	-2.0	-2.0	-3.2	-3.2
Euston Road, between Huntley Street / Sydney Park Road and Campbell Road Northbound	0.0	0.0	0.3	0.3
Euston Road, between Huntley Street / Sydney Park Road and Campbell Road Southbound	-0.3	-0.3	0.3	0.3

Road section	Increase in L_{Aeq} (dBA)			
	2021		2031	
	Day 15hr	Night 9 hr	Day 15hr	Night 9 hr
Campbell Street / Campbell Road, between Euston Road and Princes Highway Eastbound	-0.5	-0.5	0.3	0.3
Campbell Street / Campbell Road, between Euston Road and Princes Highway Westbound	-0.3	-0.3	0.6	0.6
Huntley Street, east of Euston Road Eastbound	0.3	0.3	0.2	0.2
Huntley Street, east of Euston Road Westbound	-0.7	-0.7	0.0	0.0

Table 6-29 indicates that there would be a decrease in traffic noise levels along Princes Highway and Sydney Park Road and a minor increase in redistributed traffic noise levels along Euston Road and Campbell Street/Campbell Road once the proposal is operational. The RNP notes that an increase of up to 2 dB represents a minor impact that is considered to be barely perceptible to the average person. Therefore, no safeguards or management measures are proposed to manage operational traffic noise.

6.2.5 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Noise and vibration	A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the Interim *Construction Noise Guideline* (ICNG) (DECC, 2009) and identify: • all potential significant noise and vibration generating activities associated with the activity • feasible and reasonable safeguards and management measures to be implemented, taking into account *Beyond the Pavement: urban design policy, process and principles* (Roads and Maritime, 2014). • a monitoring program to assess performance against relevant noise and vibration criteria • arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Contractor	Detailed design/pre-construction	Core safeguard NV2 Section 4.6 of QA *G36 Environment Protection*

Impact	Environmental safeguards	Responsibility	Timing	Reference
Noise and vibration	All sensitive receivers (e.g. schools, local residents) likely to be affected would be notified at least five days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The notification would provide details of: • The project • The construction period and construction hours • Contact information for project management staff • Complaint and incident reporting • How to obtain further information.	Contractor	Detailed design/pre-construction	Additional safeguard NV3
Construction hours and scheduling	Where feasible and reasonable, construction will be carried out during the standard daytime working hours and work generating high noise levels will be scheduled during less sensitive time periods.	Contractor	Construction	Additional safeguard NV4
Construction respite period during normal hours and out of hours	The duration and respite of high noise generating activities will be carried out in accordance with the CNVG, and in consultation with the community. Where possible, high noise generating activities near receivers will be carried out in blocks that do not exceed three hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite will be flexible to accommodate the usage and amenity at nearby receivers.	Contractor	Detailed design/pre-construction/ construction	Additional safeguard NV5
Plant noise levels	The noise levels of plant and equipment will have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix F of the CNVG. A noise monitoring audit program will be implemented to ensure equipment remains within the more stringent of the manufacturer's specifications or Appendix F of the CNVG. Only the necessary size and power of equipment will be used.	Contractor	Detailed design/pre-construction	Additional safeguard NV6

Impact	Environmental safeguards	Responsibility	Timing	Reference
Equipment selection	Use quieter and less noise emitting construction methods where feasible and reasonable. Ensure plant, including the silencer, is well maintained.	Contractor	Detailed design/pre-construction	Additional safeguard NV7
Use and siting of plant	The offset distance between noisy plant and adjacent sensitive receivers will be maximised. Plant used intermittently will be throttled down or shut down. Noise-emitting plant will be directed away from sensitive receivers. Only have necessary equipment on site.	Contractor	Detailed design/pre-construction	Additional safeguard NV8
Plan work sites and activities to minimise noise	Locate compounds away from sensitive receivers and discourage access from local roads where possible. Parking and loading/unloading areas will be planned to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noisy activities will be scheduled for normal working hours. If the work cannot be undertaken during the day, it should be completed before 11:00pm where possible.	Contractor	Detailed design/pre-construction	Additional safeguard NV9
Non-tonal and ambient sensitive reversing alarms	Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site and for out of hours work. The use of ambient sensitive alarms that adjust output relative to the ambient noise level will be considered.	Contractor	Detailed design/pre-construction	Additional safeguard NV10
Additional noise mitigation measures	Where the NML at a receiver is exceeded after the standard mitigation measures listed in Appendix B of the Noise and Vibration Assessment (Appendix D) have been implemented, additional noise mitigation measures as per Appendix C of the CNVG will be considered.	Contractor	Detailed design/pre-construction	Additional safeguard NV11

Impact	Environmental safeguards	Responsibility	Timing	Reference
Vibration	Building condition surveys should be conducted at all residential and other sensitive receivers (including heritage buildings) identified to be impacted by vibration from the construction site to identify any existing damage and damage due to the construction works.	Contractor	Pre-Construction	Core safeguard NV12 Section 4.7 of QA *G36 Environment Protection*
Construction vibration	Consider including the following measures into the CVMP to limit construction vibration levels: • Use lower vibration generating items of excavation plant and equipment where feasible • Suitably program the hours of operation of major vibration generating plant and equipment • Minimise consecutive work in the same locality • Undertake attended vibration monitoring where vibration-intensive work is required to be undertaken within the safe working distances • Complete building condition surveys before and after vibration-intensive work to identify existing damage and any damage due to the works schedule and localised geotechnical conditions are known.	Contractor	Detailed design/pre-construction	Core safeguard NV13 Section 4.7 of QA *G36 Environment Protection*

6.3 Non-Aboriginal heritage

An assessment has been prepared to identify the extent and magnitude of potential impacts of the proposal on non-Aboriginal heritage items. This assessment is presented in the Sydney Park Junction Statement of Heritage Impact (SoHI) (Jacobs, 2021b) which is provided in Appendix F.

A summary of the SoHI is presented in this section, together with safeguards and management measures to mitigate any negative impacts.

6.3.1 Methodology

The methodology for the non-Aboriginal assessment involved:

- A brief historical research of the locality through publicly available primary and secondary sources such as maps and parish plans, to identify potential heritage and archaeological items
- A search of the heritage databases, including the State Heritage Register (SHR), State Heritage Inventory (SHI), Section 170 Heritage and Conservation Registers, the Sydney LEP and the Marrickville LEP, the World Heritage List (WHL), National Heritage List (NHL), Commonwealth

Heritage List (CHL) and Register of the National Estate (RNE), to identify previously recorded non-Aboriginal heritage items in the study area, and the legislative obligations related to these

- Review of the provided photographs of the study area to confirm current general condition of the existing and any potential heritage items
- Assessment of the heritage significance of the existing and potential heritage items
- Assessment of the impact of the proposal on the existing and potential items of heritage significance, and potential archaeological items
- Recommendations for the management and/or mitigation of any impacts upon these heritage items.

This assessment has been completed in accordance with the principles of the *Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance 2013* (Burra Charter) (Australia ICOMOS 2013), the *Assessing Heritage Significance* (NSW Heritage Office 2001), and the *Statements of Heritage Impact guidelines* (NSW Heritage Office 2002).

For this assessment, the proposal area is defined as the area that would be directly impacted by the roadworks and the study area is defined as the proposal area and a 10 metre buffer to allow for the assessment of potential indirect impacts.

6.3.2 Existing environment

Historical context

Non-Aboriginal settlement of the area began in the 1790s, when land was typically used for agriculture. The first known land grant in the St Peters area was made in 1796 to former convict and publican Elizabeth Needham. Today's Sydney Park is situated on part of Needham's land, which she owned until 1808, when it was taken up by Gregory Blaxland. Blaxland was a farmer, speculator and explorer who crossed the Blue Mountains with William Charles Wentworth and William Lawson. In 1822, the land was taken up by Blaxland's son, John Blaxland, who was a merchant who lived in Ryde. Subsequently, the land was taken up by Daniel Cooper in 1853, a former convict, miller, brewer, shipper and banker who, while owning the land, returned to England in 1831.

Today's Alexandria, in which Sydney Park is situated, is located within the Parish of Alexandria, in the County of Cumberland. The Municipality of Alexandria, originally known as Waterloo Ward, was formed in August 1859. Despite the early formation of the municipality, people began settling in Alexandria primarily from 1868, when many terrace houses and cottages were constructed. St Peters is located within the Parish of St Peters within the County of Cumberland. The St Peters township was laid out in 1840 and the Municipal District of St Peters was formed in January 1871.

The St Peters, Newtown and Alexandria areas were known for their rich alluvial soil, which was ideal for gardens and orchards, while the clay beds of the region were ideal for pottery and brickmaking. As such, brick, pottery and tile works were established in the area from the late 1800s into the early 1900s. By 1881, Needham's original grant had been subdivided for the Newtown brickyards leases over what is now Sydney Park. Plans of the subdivision show that today's Sydney Park was bounded by Barwon Park Road and Cooks River Road (Princes Highway) in the west, and Waterloo Road (Sydney Park Road) in the north.

By the late 1880s, parish maps show that the study area is located within the Parishes of Petersham and Alexandria. Much of the land to the southeast of the study area comprised brickyards, with the land being noted as having been subject to extensive excavations. Brickyards were also then extant to the north of the study area between the former Signal Street, today's Coulson Street and Mitchell Road, and Waterloo Road (Sydney Park Road). Another brickyard was noted as 'Goodsell's Old Brickyard', situated adjacent the railway line at the end of Goodsell Street. Henry Wesley Goodsell's 'Goodsell's Steam Brick Factory' was constructed within the Goodsell Estate area in 1869. Residential housing within the Goodsell Estate dates from 1883 to 1957. Other brickyards also included Josiah Gentle's brickworks, the Bedford Brick Works, which he established at Sydney Park in 1893.

Allotment sales plans from the early 1880s shows that a number of buildings were extant adjacent to Cooks River Road (Princes Highway). This includes a post office and Royal Forresters Hall, a hall used for concerts and other performances, near today's post office. Neither building is extant today.

The St Peters Railway Station, adjacent to the construction footprint, was opened on 15 October 1884 on the Illawarra railway line as part of the Eveleigh to Hurstville section. The establishment of the railway station led to both residential and industrial growth in the region, particularly in St Peters, into the early 1900s. The brick King Street rail overbridge located within the proposal area is in good condition and was built around 1900. Today, the railway station is an operational railway station on the Eastern Suburbs and Illawarra railway line.

The Cooks River tramway ran from City Road to Broadway in Camperdown, along King Street and past St Peters Railway Station, along what is now the Princes Highway, to its terminus at Cooks River. The horse-drawn tramline to St Peters opened in 1891. It was replaced by steam trams in 1898 and by electric trams in 1899. The line from St Peters to Cooks River opened in 1900. The 1916 Parish of Petersham map also shows a tramline running along Waterloo Road (Sydney Park Road). These tramlines were closed on 28 September 1957.

By the early 1900s, both Alexandria and St Peters had become primarily industrial, although small areas of Alexandria also included housing estates during this period. The changing nature of the region during this period was due to its proximity to the railway yards and the various brickworks that had been established within St Peters and Alexandria, and within neighbouring Newtown to the north. St Peters was known as Sydney's brickmaking centre until after World War II, when some industrial sites were no longer in operation. After World War II, these former industrial areas were transformed into parks and housing.

The Barwon Park Road substation was built in the Interwar Art Deco style between 1939 and 1941 as a part of the Sydney County Council's expansion of the electricity network into the suburbs. Another Art Deco-influenced building within the area comprises the St Peters Hotel, which is part of the King Street Retail Precinct. The hotel forms the southern part of the historical King Street Heritage Conservation Area (dating from 1870 to 1930) in Newtown. The historical aerial imagery also shows that Munni Channel, a Sheas Creek stormwater channel, was extant at the eastern side of the brickworks site in 1943. While population increased in Alexandria from the 1990s, due to urban renewal programs, population in St Peters started to grow from 2001 as new dwellings were added to the suburb.

Brickworks

The Bedford brickworks, operated by the Gentles, occupied the present site of Sydney Park, at its northwest corner. The works, concentrated on dry-press bricks, grew rapidly and became one of the largest brickworks in the area known as 'The Flat'. It imported two patent kilns, which were a Hoffman (sometimes written Hoffmann) Patent Kiln and a Hardy Patent Kiln. They produced common bricks in large quantities, being designed for high output and continuous firing. There were six down draught kilns, in two clusters. Since their design allowed exact control of the firing process, they produced coloured faced bricks called 'specials' or 'facing bricks'. Extensive underground flues and dampers led from the kilns to the three chimneys. A fourth chimney was placed in the Hoffman kiln. Central to the production procedure was the processing plant, a two storey building with a brick base and storey post construction with corrugated iron walls. Here all processes preliminary to the operation of the kilns were carried on.

The Bedford site was fronted, on the corner of Mitchell Street and Princes Highway, by a two-storey brick office building, a more impressive structure than that usually associated with brickworks.

During the Depression of the early 1930s some operations were shut down and others underwent rationalisation. In 1933, the Gentle family was succeeded at the Bedford works by the Austral Brick Company. After a period of decline, the Bedford site was closed in 1970. The original Austral Brick Company site remained in operation until 1983.

All that remains of the brickworks now is:

- Hardy Patent Kiln and Chimney No. 2
- Hoffman Patent Kiln with semi-circular end and Chimney No. 4
- Down draught kilns No. 1 and 2 and Chimney No. 1

- Down draught kiln No. 3 and remnants of down draught kilns No. 4 and 5
- Chimney No. 3 and former processing plant site.

The *Sydney Park Brick Kiln and Chimney Precinct (Former Bedford Brickworks and Austral Brick Company Brickworks) at cnr Princes Highway and Sydney Park Road, St Peters NSW Heritage and Structural Assessment* (Tropman and Tropman Architects, 2000) was prepared as part of the later Conservation Management Plan (CMP) for the Former Brick Kilns and Chimney Precinct within Sydney Park. The report contained a heritage and structural assessment, a fabric analysis, analysis of documentary and physical evidence, a structural engineering report and conservation management policies for the brick kilns and chimneys.

The assessment concluded that the brick kilns and their curtilage are of high historical, aesthetic, social and technical/research significance. It is representative of local brickyards built near existing clay sources and transport facilities and was a vital source of employment in the local area for generations, contributing to the development of the suburb of St Peters. A structural engineering report found that in 2000, the existing buildings and chimneys were in reasonably good condition and would be suitable for adaptive reuse where compatible with the Sydney Park Plan of Management.

The assessment contains a number of policies designed to conserve and manage the heritage values of the site. The first policy states that all sub-surface areas 'below and adjacent to the site' should be considered to have research potential.

The *Sydney Park Brick Kilns Precinct, Cnr Princes Highway and Sydney Park Road, Alexandria Conservation Management Plan* (Tropman and Tropman Architects, 2007) was prepared for the Sydney Park Brick Kilns Precinct within Sydney Park for the City of Sydney Council. The 2007 CMP was based on the earlier Heritage and Structural Assessment and comprised an assessment of both Aboriginal and historical heritage values of the site.

The 2007 CMP identified the following Individual elements on the subject site which are considered to be of heritage significance:

- All kilns and chimneys
- Remnant industrial archaeology/heritage technology including boiler, crushing mill and flues
- Views to the brick kiln precinct.

All sub-surface areas below and adjacent to the site are considered to have archaeological potential. The 2007 CMP recommends that any new works should be carefully designed to avoid disturbance of any archaeological items located on the site and adjacent areas. In the event of any disturbance having to take place, a suitable heritage consultant or archaeologist should be engaged to assess, record and monitor the works.

The 2007 CMP also states that the relationship between the brick kilns and chimneys and the associated roadways should be conserved, the views and vistas to the brickworks complex should be maintained, and significant fabric should be conserved. Landscaping techniques should be considered to interpret the locations of former buildings and brickpits, and alternatives to the existing hard landscaping to the site should be investigated.

Sydney Park

From 1948, the deep clay brick-pits in Sydney Park became a major municipal waste depot for Sydney. It was known by several names including the St Peters tip; Campbell Road Disposal Depot; Alexandria Tip; and the Disposal Depot Alexandria. In the 1960's, the south-west and mid-north sections of Sydney Park were used as part of a regular waste disposal programme. In the early 1970's, with the closure of the former Bedford works, the remainder of the northern section was given over to waste disposal. The programme had ceased by 1976, although further 'passive' infill took place in the central-west section. When St Peters tip was finally closed, a final layer of soil and building rubble was placed over the former brickpits to create a new regional park. In 1982 a Master Plan was adopted for the site that proposed a series of staged developments, the first of which included the restoration of the kilns and chimneys on the Sydney Park Road and King Street corner. The Master Plan outlined the concept of Sydney Park as an urban woodland, with passive recreational use and a system of ponds.

In 1991, ownership of the Sydney Park site was transferred to the South Sydney Council, and to the City of Sydney once the two councils merged in 2004. The current Sydney Park Plan of Management (POM) was adopted by the City of Sydney on 12 May 2014 (City of Sydney Council, 2014). The aim of the POM is to protect the cultural heritage and ecology of Sydney Park, and to provide increased recreational, community and cultural activities for the Sydney community. The POM notes that Sydney Park is now used for informal and passive recreation, informal games, education and lifelong learning, and social and cultural events. It states that any further development of Sydney Park will be consistent with the objectives of this plan, the categorisation of community land, any approved development application, and any applicable development control plan. Any use or development that would encroach on the park's open space or that is not consistent with the park's roles should be discouraged.

In terms of Sydney Park's historical heritage, the POM notes that there was a community desire to identify, conserve and interpret the Park's heritage significance in relation to clay extraction and brick manufacturing, which is linked to the broader history of the local area and which contributed to the development of Sydney. Based on the results of the 2007 CMP, the Brick Kilns Precinct was identified as such as an area of heritage significance. The Sydney Park POM provides conservation policies for the brick kilns area; the most applicable of these to the current proposal states that:

> *All sub-surface areas below and adjacent to the site should be considered to have archaeological potential. Generally, any new works should be carefully designed to avoid disturbance of any archaeological items located on the site and adjacent areas* (City of Sydney Council, 2014, p. 28).

In terms of future use and development of the brick kilns area, the Plan further states that:

> *no activity should take place which could destroy a potential archaeological resource* (City of Sydney Council, 2014, p. 39).

Archaeological potential

The history of the area suggests that much of the land adjacent to the study area has been occupied since the 1790s, when land grants were made available in the region. St Peters and Alexandria were townships which were established in urban landscapes, with the township of St Peters being predominantly settled from the 1840s, and people later settling into terrace houses and cottages in Alexandria from 1868. However, by the late 1800s, the areas became predominantly industrial in nature as brickworks were established in both areas to make use of the clay beds in the region. Due to the extensive nature of the urban sprawl across the region, there is little potential for archaeological relics relating to the region's rural past to be present within the study area.

However, as identified in the background history and from the literature review, the study area also has archaeological potential in relation to the former brickworks to the southeast of the intersection of King Street and Sydney Park Road (Bedford and Austral Brickworks), and to the tramways that formerly ran along King Street, Princes Highway, and Sydney Park Road.

There is the potential for archaeological remains associated with the brickworks to be present in both the current footpath and roadway next to the brickworks in King Street and in Sydney Park Road due to the removal and reduction of the brickworks and other buildings in these locations. It is likely that the more extensive works associated with the realignment of the roadway would have removed or disturbed the subsurface archaeology to a deeper level than that of the footpath. As such, the area of archaeological potential for the brickworks has been divided into two: one area consisting of the footpath where the archaeology is likely to be closer to the surface, and one area consisting of the roadway where the archaeology is likely to be at a deeper level under more road base/fill.

The subsurface locations of the extant tram tracks have been identified using ground penetrating radar. This information has been used to delineate the area of archaeological potential for the former tramways.

The areas of archaeological potential are mapped in Figure 6-13.

Registered historic heritage

There are six listed heritage items and three listed heritage conservation areas located within 10 metres of the proposal area. These heritage items are summarised in Table 6-30 and shown in Figure 6-14.

Figure 3-11 | Location of the area of archaeological potential

King Street Gateway

Figure 6-13 Areas of non-Aboriginal archaeological potential in the study area

Table 6-30 Non-Aboriginal heritage near the proposal

Item Name	Address	Register(s)	Significance	Distance from proposal area (metres)
St Peters Railway Station Group	Princes Highway (opposite Sydney Park Road), St Peters	• SHR (01250) • State Rail Authority S170 Register • Marrickville LEP 2011 (I272)	State	Curtilage intersects proposal area
Electricity Substation No. 549	Princes Highway, St Peters	• Ausgrid S170 Register • Marrickville LEP 2011 (I369)	Local	Curtilage intersects proposal area
Goodsell Estate Heritage Conservation Area	West of King Street, south of St Peters station	• Marrickville LEP 2011 (C16)	Local	Curtilage intersects proposal area
St Peters Hotel, including interiors	631 King Street, Newtown	• Marrickville LEP 2011 (I159)	Local	Directly adjacent
Former Brickworks Group	Sydney Park Road, St Peters	• Sydney LEP 2012 (I27)	Local	Curtilage intersects proposal area
King Street and Enmore Road Heritage Conservation Area	North of Illawarra railway line, west of King Street	• Marrickville LEP 2011 (C2)	Local	Directly adjacent
Former St Peters Theatre Façade	672 King Street, Erskineville	• Sydney LEP 2012 (I614)	Local	Directly adjacent
King Street Heritage Conservation Area	North of Illawarra railway line, east of King Street	• Sydney LEP 2012 (C47)	Local	Directly adjacent
Sydney Park AIDS Memorial Groves	Barwon Park Road, St Peters	• NHL (106068) (nomination ineligible for PPAL)	_	Directly adjacent

Figure 6-14 Listed non-Aboriginal heritage within study area

Site visit

A site visit was undertaken on 1 May 2020, to take photos of heritage items near the proposal area.

The curtilages of the St Peters Railway Station, Brickworks, Goodsell Estate Heritage Conservation Area, Electricity Substation No 549 and the Sydney Park AIDS Memorial Groves heritage items intersect with the construction footprint. The curtilages of the St Peters Hotel, King Street and Enmore Road Heritage Conservation Area, Former St Peters Theatre Façade and King Street Heritage Conservation Area heritage items are all outside but immediately adjacent to the construction footprint.

The majority of St Peters Railway (Photo 6-1) is situated within the railway cutting, with the pedestrian footbridge and upper levels of the railway station building being at ground level. The closest portion of the railway station building is the upper level structure near Goodsell Street at the southern end of the footbridge (Photo 6-2). An apartment complex worksite is situated between the construction footprint and the railway station. However, the rail overbridge (Photo 6-3), which is part of the listed heritage item, is within the construction footprint.

St Peters Plaza (Photo 6-4), which is situated adjacent to the railway station opposite Sydney Park Road, is lined in the north by the brick walls of the St Peters Railway Station's southern retaining wall, and comprises a paved area with what appears to be a peppercorn tree. A plaque commemorating the establishment of the park by the Marrickville Municipal Council is situated at the foot of the tree (Photo 6-5). While St Peters Plaza is not part of the SHR curtilage of St Peters Railway Station, and it not listed on any register, it is a potential heritage item whose significance is assessed in Section 6.3.3.

While the heritage boundary of the Goodsell Estate Heritage Conservation Area extends onto May Street and King Street and across May Lane at its intersection with Goodsell Street, the buildings within the conservation area are all outside the construction footprint. However, the awnings of some of the buildings along King Street near the corner of May Street, extend across much of the existing footpath and are located within the construction footprint (Photo 6-6).

The St Peters Hotel is the nearest building within the King Street and Enmore Road Heritage Conservation Area to the construction footprint. Although the hotel has an awning, an electricity pole and traffic lights are situated outside the southeast corner of the hotel between the construction footprint and the hotel awning (Photo 6-7).

The Former St Peters Theatre Façade, which is also within the King Street Heritage Conservation Area, is also situated outside the construction footprint. The theatre has an awning that overhangs a section of the footpath (Photo 6-8). The traffic lights on Concord Street are situated between the construction footprint and the heritage building.

The buildings and chimneys of the Former Brickworks Group are situated adjacent to King Street and Sydney Park Road (Photo 6-9). A grass-covered and tree-lined nature strip and a footpath is situated between the construction footprint and the brickworks chimneys and kilns, except where the construction footprint within the Sydney Park carpark is immediately adjacent to the Hoffman Patent Kiln (Photo 6-10 and Photo 6-11).

The curtilage of the Electricity Substation No 549, situated adjacent to the Princes Highway, is intersected by the construction footprint. An electricity pole is situated outside the building, on the footpath between the substation and the Princes Highway (Photo 6-12).

The Sydney Park AIDS Memorial Groves is located within Sydney Park, to the south of the King Street/Princes Highway carpark. A grassed lawn is situated between the groves and the footpaths where the construction footprint intersects with the corner of the memorial groves.

Photo 6-1 View of the King Street railway metal pedestrian bridge and adjacent railway cutting, and brickworks chimneys in the background, facing south

Photo 6-2 View facing southwest at Lord Street, showing upper level of the St Peters Railway Station building and footbridge

Photo 6-3 View of the King Street rail overbridge facing east, showing the overbridge's brick wall and the bitumen-covered roadway

Photo 6-4 View of St Peters Plaza, with the St Peters Railway Station brick wall (part of the station's retaining wall) on the right, facing west

Photo 6-5 Plaque commemorating the construction of St Peters Plaza, situated near St Peters Railway Station and overbridge

Photo 6-6 View of the Goodsell Estate Heritage Conservation Area from the Princes Highway, facing northwest

Photo 6-7 View of St Peters Hotel, within the King Street and Enmore Road Heritage Conservation Area, at the intersection of King and Lord Streets, facing

Photo 6-8 The former St Peters Theatre Façade, within the King Street Heritage Conservation Area, on King Street, facing east

Photo 6-9 View of the brickworks chimneys, which are situated adjacent King Street near Sydney Park Road, from within Sydney Park, facing west

Photo 6-10 View of the Hoffman Patent Kiln adjacent to King Street at Sydney Park, facing north

Photo 6-11 View between the Hardy Patent Kiln and the Hoffman Patent Kiln adjacent King Street at Sydney Park, facing south

Photo 6-12 View of the Electricity Substation No 549 adjacent to the BP petrol station from the Princes Highway, facing east

6.3.3 Assessment of significance

Assessments of significance were carried out for listed and unlisted heritage items and areas of archaeological potential within and near the study area. Heritage assessments and statements of heritage

significance from existing registers such as the State Heritage Inventory (SHI) have been included where relevant.

In NSW, heritage is assessed against seven criteria that encompass the values in the Australia ICOMOS Burra Charter. If an item meets one or more of the seven heritage criteria, it can be considered to have significance. The heritage significance of the listed and unlisted heritage items within the study area is provided in the SoHI (Jacobs, 2021b) (refer to Appendix F) and summarised in Table 6-31.

Table 6-31 Summary of heritage significance assessments

Item	Historical	Associative	Aesthetic/ Technical	Social	Research potential	Rarity	Represent-ativeness
St Peters Railway Station Group	✓	✓	✓	✓	✓		✓
Electricity Substation No. 549	✓		✓				✓
Goodsell Estate Heritage Conservation Area	✓		✓				✓
Former Bedford Brickworks	✓	✓	✓	✓	✓	✓	✓
Sydney Park AIDS Memorial Groves			✓	✓			
St Peters Hotel, including interiors	✓		✓	✓			✓
King Street and Enmore Road Heritage Conservation Area	✓		✓	✓			✓
Former St Peters Theatre Façade	✓	✓	✓	✓	✓	✓	✓
King Street Heritage Conservation Area	✓		✓	✓		✓	

6.3.4 Potential impacts

Direct impacts

Works which are proposed to take place within the study area are predominantly comprised of roadworks and pavement and landscaping works, as detailed in
Section □.

The level of impact on the heritage significance of each heritage item in the study area has been assessed based on the definitions and framework for assessing severity of impacts from the *EPBC Act Significant impact guidelines 1.2* (Department of Sustainability Environment Water Population and Communities, 2013).

The following criteria were used to assess the level of impact:

- The scale of the proposed work and its impact
- The intensity of the proposed work and its impact
- The duration and frequency of the proposed work and its impact.

The levels of impact used for assessing the magnitude of the impact are defined in Table 6-32. The impacts to the cultural heritage significance of the heritage items from the proposed works with potential impacts are detailed in Table 6-33.

Table 6-32 Terminology for assessing the magnitude of heritage impact

Two or more characteristics	Scale	Intensity	Duration/frequency
Major	Medium – large	Moderate – high	Permanent / irreversible
Moderate	Small – medium	Moderate	Medium – long term
Minor	Small / localised	Low	Short term / reversible
Negligible	Little or no physical impact; or little or no impact on heritage significance from physical impacts; or potential physical impacts can be prevented through implementation of management measures.		

Table 6-33 Potential impacts on non-Aboriginal heritage items intersecting with the study area

Item	Works	Heritage impact
St Peters Railway Station Group (SHR 01250)	• Widening of footpath on the western side of King Street between May Street and Concord Street • Widening of footpaths and additional landscaping western side of King Street between May Street and Concord Street.	The proposal area intersects with the SHR heritage boundary along King Street. The proposed works would be carried out on the King Street rail overbridge. The railway station and its heritage features, including the c.1900 brick overbridge itself, has historical and aesthetic significance. The proposed works would be confined to the road surface, guttering, and part of the footpaths on the overbridge. The structure of the overbridge is unlikely to be impacted by the works, as they are confined to the surface of the road corridor. The brick walls on either side of the overbridge at street-level are separated from works by the footpath. There would not be any direct impact to these walls but there may be unintended impact upon the overbridge's street-level brick walls from the use of construction machinery and vehicles within proximity to the heritage item. The railway station is predominantly within a railway cutting below the road surface and would not be impacted. The level of potential impact on heritage item before any safeguards and management measures are implemented would be **minor**.
Electricity Substation No. 549 (s170 Ausgrid)	• Widening of the footpath on the eastern side of Princes Highway between Campbell Street and May Street	The proposal area intersects with the curtilage of the heritage item along Princes Highway. Works would be carried out immediately adjacent to the heritage building. There is a footpath and an electricity pole situated between the roadway (where the majority of works would occur) and the heritage item. The Art Deco façade of the heritage item would not be directly impacted, however unintended impacts are possible from the use of construction machinery and vehicles within proximity to the heritage item. The level of potential impact on heritage item before any safeguards and management measures are implemented would be **minor**.
Goodsell Estate Heritage Conservation Area (Marrickville LEP C16)	• Signalised shared crossing on King Street between May Street and Goodsell Street • Removing traffic signals at the Princes Highway/King Street and May Street intersection and reconfiguring May Street	The proposal area intersects with the curtilage of the heritage item along May Street and King Street. The awnings of the shops within the Heritage Conservation Area overhang much of the adjacent footpath along King Street and the corner of May Street and King Street. As such, the awnings may be subject to the risk of incidental impacts from the use of construction machinery and vehicles during the proposed works. The detailed design would need to consider the awnings in order to avoid direct impacts. The level of potential impact on heritage item before any safeguards and management measures are implemented would be **minor**.

Item	Works	Heritage impact
Former Brickworks Group (Sydney LEP I27)	• Reducing the Princes Highway/King Street carriageway • Reducing the Sydney Park Road carriageway • Replacing existing signalised pedestrian crossings with shared crossings on all approaches and relocating existing traffic signals at the King Street and Sydney Park Road intersection; • New landscaping along Princes Highway, King Street and Sydney Park Road	The proposal area intersects the curtilage of the heritage item along King Street and within the Sydney Park carpark along King Street/Princes Highway. The two areas of archaeological potential associated with the brickworks are beneath the footpath and the adjacent roadway on King Street and Sydney Park Road, outside the LEP heritage boundary. Proposed works will occur within these areas of archaeological potential, including surface roadworks and landscape treatments. While the proposed works are not likely to require a great depth of sub-surface excavation there is still the potential for works to disturb archaeological remains. Disturbance to archaeological remains is more likely to occur in the footpath area than the roadway area, as it is assumed that greater depths of earlier disturbance from road base and construction is likely to have occurred in the road. The proposed works in the roadway are unlikely to disturb archaeological remains in this location due to the shallow nature of the works. New landscaping elements along King Street and Sydney Park Road may obscure the views of the brickworks along King Street and Sydney Park Road and the views to and from Sydney Park, both of which are views of Exceptional heritage significance. The presence of equipment and machinery during construction would also impact on views of Exceptional heritage significance in and around the brickworks. Changes to the layout of King Street and Sydney Park Road is not anticipated to permanently impact the views of the Brickworks structures and buildings. Works would be carried out in the carpark immediately adjacent to the Hoffman Patent Kiln. There is the potential for the Hoffman Patent kiln to be subject to incidental impacts from the use of construction machinery and vehicles nearby. The detailed design would need to consider the heritage kiln in order to avoid direct impacts. The level of potential impact on the potential archaeological items would be **moderate**, while impact upon the heritage item before any safeguards and management measures are implemented would be **minor**.
Sydney Park AIDS Memorial Groves (NHL 106068) **Nomination now ineligible for PPAL**	• Lane reconfiguration works in Barwon Park Road	The proposal area intersects with the heritage curtilage at the northern pathway into the memorial groves. The closest grove of trees within the memorial are approximately 20 metres from the proposal area. As such, works carried out along Barwon Park Road are unlikely to impact upon this heritage item. However, due to the sensitive nature of this heritage item, and its social significance to the community, there may be a level of community concern with any works taking place within the vicinity of the memorial groves. The level of potential impact on heritage item before any safeguards and management measures are implemented would be **minor**.

Item	Works	Heritage impact
St Peters Hotel (Marrickville LEP I159)	• Reducing the King Street carriageway • Widening of footpaths and additional landscaping western side of King Street between May Street and Concord Street.	The proposal area is immediately adjacent to these heritage items. Footpaths are situated between the heritage items, including the awnings of St Peters Hotel and the Former St Peters Theatre Façade, and the construction footprint. As such, the awnings of St Peters Hotel and the Former St Peters Theatre Façade may be subject to the risk of incidental impacts from the use of construction machinery and vehicles nearby. The detailed design would need to consider the awnings in order to avoid direct impacts. The level of potential impact on heritage item before any safeguards and management measures are implemented would be **minor**.
King Street and Enmore Road Heritage Conservation Area (Marrickville LEP C2)		
Former St Peters Theatre Façade (Sydney LEP I614)		
King Street Heritage Conservation Area (Sydney LEP C47)		
Potential archaeological items - tramway	• Works along Princes Highway, King Street, and Sydney Park Road • Pavement and landscaping works adjacent to former Brickworks	The proposal area intersects with the tramway area of archaeological potential. This area comprise the subsurface remains of the former tram tracks and related infrastructure along Princes Highway, King Street and Sydney Park Road. As such, excavations within roadways and pavements may impact upon any remaining archaeological features of these two areas. The level of potential impact on heritage item before any safeguards and management measures are implemented would be **moderate**.

Vibration impacts

As indicated in the Noise and Vibration Assessment (refer to Section 0), all heritage buildings and structures identified in the study area are within the minimum working distances specified under the DIN 4150 Group 3 vibration guidelines for a medium size vibratory roller or medium sized rock breaker. As such they are subject to the potential for impacts from vibration.

Guidelines for the measurement of vibration impacts (refer to Section 0) indicate that a building of historical value should not be assumed to be sensitive to vibration on the basis of being classed a heritage item, unless it is structurally unsound. As such, heritage buildings should be considered on a case by case basis, and further investigation would be carried out during detailed design for all potentially affected structures.

Where buildings or structures are considered sensitive to vibration, appropriate vibration criteria would be determined after detailed inspections have been completed. A dilapidation survey should be carried out to confirm the sensitivity of the item to vibration induced damage and the appropriate criteria applied.

6.3.5 Safeguards and management measures

With the implementation of the safeguards and management measures listed below, the level of impacts on heritage items are considered to be minor (for the areas of archaeological potential) or negligible (for all other heritage items).

Impact	Environmental safeguards	Responsibility	Timing	Reference
Non-Aboriginal heritage	• Prepare and implement a Non-Aboriginal Heritage Management Plan (NAHMP) as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to non-Aboriginal heritage.	Contractor	Detailed design/ pre-construction	Core safeguard NAH1 Section 4.10 of QA *G36 Environment Protection*
St Peters Railway Station Group	• Submit a Section 57 Exemption Notification to the Heritage Council of NSW for approval prior to construction for temporary construction activities within the curtilage of the SHR listed 'St Peters Railway Station Group'.	Transport for NSW	Detailed design/ pre-construction	Additional standard safeguard NAH2
Areas of archaeological potential associated with the Former Brickworks Group	• Apply for a Section 140 Excavation Permit prior to construction for any subsurface disturbances or excavations deeper than 200 millimetres within the footpath area of archaeological potential next to the Former Brickworks Group.	Contractor	Detailed design/ pre-construction	Additional standard safeguard NAH3

Impact	Environmental safeguards	Responsibility	Timing	Reference
Areas of archaeological potential associated with the Former Brickworks Group	• For any subsurface disturbances or excavations deeper than 200 millimetres within the footpath area of archaeological potential, undertake archaeological monitoring by an appropriately qualified historical archaeologist in accordance with the Excavation Permit, under the supervision of an historical archaeologist who meets the NSW Heritage Council's Excavation Director criteria. • For any ground-disturbance works occurring within the roadway area of archaeological potential associated with the brickworks, ensure that an appropriately qualified historical archaeologist is on call in the advent that any unexpected historical archaeological sites or items are found. The *Transport for NSW Standard Management Procedure: Unexpected Heritage Items* (Roads and Maritime 2015) should be implemented if any relics are uncovered. • The archaeologist that will take undertake archaeological monitoring during the works should prepare a detailed research design and methodology in accordance with *Archaeological Assessments: Archaeological Assessment Guidelines* (NSW Heritage Office 1996) to support the proposed safeguards and management measures for archaeological investigation. During works, they will monitor, investigate and record all archaeological features and deposits.	Contractor	Construction	Additional standard safeguard NAH4
Tramways area of archaeological potential	• For any works within the tramways area of archaeological potential, undertake archaeological monitoring by an appropriately qualified historical archaeologist, under the supervision of an historical archaeologist who meets the NSW Heritage Council's Excavation Director criteria. • If extant tram lines are encountered during excavation, where possible it will be left in situ in and road surfacing would be constructed over the tram line to main historic elements on site.	Contractor	Construction	Additional standard safeguard NAH5
Non-Aboriginal heritage	Follow the *Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) in during construction in the event that any unexpected heritage items, archaeological remains, human remains or potential relics of Non-Aboriginal origin are encountered. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design/ pre-construction	Core safeguard NAH6 Section 4.10 of QA *G36 Environment Protection*

Impact	Environmental safeguards	Responsibility	Timing	Reference
Site induction	Train all personnel working on site to ensure they are aware of the requirements of the NAHMP and relevant statutory responsibilities. Provide site-specific training to personnel when working in the vicinity of identified non-Aboriginal heritage items.	Contractor	Pre-construction	Additional safeguard NAH7
Non-Aboriginal heritage	Consult City of Sydney Council, Inner West Council and Ausgrid prior to construction to ensure any requirements about their heritage assets are identified and incorporated into the proposal.	Transport for NSW	Detailed design/ pre-construction	Additional safeguard NAH8
Non-Aboriginal heritage	To prevent inadvertent impacts to significant heritage listed buildings and fabric during construction, implement temporary protection measures such as fencing, delineation of 'no-go' areas or placing visual bunting tape around the following heritage items: • Brick walls on either side of rail overbridge of St Peters Railway Station Group • Kilns and chimneys of the Former Brickworks Group • Electricity Substation No. 549 • Awnings and building of St Peters Hotel • Awnings and buildings of King Street and Enmore Road Heritage Conservation Area • Awnings and building of Former St Peters Theatre Façade • Awnings and buildings of King Street Heritage Conservation Area • Sydney Park AIDS Memorial Groves .	Contractor	Pre-construction	Additional safeguard NAH9
Non-Aboriginal heritage	Choose materials for signage, kerbs, and other road infrastructure that are compatible and complimentary to the surrounding heritage character of the study area. Landscaping elements along King Street and Sydney Park Road should be in keeping with the current industrial landscape of the area. They should not block the following elements of Exceptional heritage significance of the Former Bedford Brickworks Group: • the views and vistas along King Street and Sydney Park Road • the views and vistas to and from Sydney Park.	Transport for NSW	Detailed design/pre-construction	Additional safeguard NAH10
Non-Aboriginal heritage	Further, if sandstone kerb and gutters are impacted within the proposal area during construction, they must be properly recorded and reinstated to the original condition post construction.	Contractor	Construction	Additional safeguard NA11

6.4 Aboriginal cultural heritage

6.4.1 Methodology

The *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (Roads and Maritime Services, 2011) has been followed in the assessment of the potential impact to Aboriginal culture and heritage. The assessment involved a search of the Aboriginal Heritage Information Management System (AHIMS) (21 May 2020) and a consideration of the levels of previous disturbance within the proposal area and surrounding areas.

6.4.2 Existing environment

Aboriginal context and land use

The original people to occupy the St Peters, Alexandria and Erskineville areas were part of the Darug language group, who occupied the region for about 20,000 years prior to European occupation. The assessment area is located on land within the boundaries of the Darug linguistic group, which were split into two dialects: the coastal dialect, spoken between Sydney Harbour and Botany Bay, and west to Parramatta; and the hinterland dialect, spoken to the west of the Cumberland Plain (Attenbrow, 2010). Within the Sydney region, the peoples who spoke this coastal dialect group are now known as the Eora Nation (City of Sydney Council, 2013b).

Gumbramorra Swamp originally covered the assessment area at St Peters (Inner West Council, 2020). The area around Sydney Park was referred to as the 'Kangaroo Ground', where local Aboriginal peoples of the Gadigal and Wangal clans of the Eora nation, hunted for kangaroo. They also fished and camped at the swamps, creeks and rivers that crisscrossed the region (City of Sydney Council, 2018).

Landform

The assessment area comprises the Ashfield Plains landscape within the Cumberland Sydney Basin Bioregion (NSW Government, 2020). This landform comprises undulating hills and valleys on horizontal Triassic shale and siltstone, with occasional silt sandstones towards Port Jackson. Soils consist of red and brown texture-contrast soils on crests grading to yellow harsh texture-contrast soils in valleys (DECCW, 2002). The surface geology comprises Wianamatta Group Ashfield shale, which is made of dark grey siltstone, which was used during the 19th and 20th centuries for brick-making (City of Sydney Council, 2018; STEP Inc, 2017). Ashfield Shale is the lowermost of the Wianamatta Group formations, and is composed of a 'sequence of dark-grey to black, sideritic siltstones frequently imbedded with thin silt bands' (Willian & Airey, 2005 (p 451)). Landforms in the study area would have had potential to retain Aboriginal heritage sites and artefacts.

Aerial imagery review

Historical aerial imagery of the assessment area dating to 1943 (SIX Maps, 2020) shows that the assessment area primarily comprised extant roadways lined by industrial buildings and factories. Clay brick pits and associated buildings are also visible in what is now Sydney Park, adjacent to the assessment area. The railway line is present in the northwest.

Modern aerial imagery (Google, 2021) shows that the assessment area still comprises roadways within an industrial setting, except where the former brickworks have been transformed into Sydney Park.

AHIMS search

A search of the Aboriginal Heritage Information Management System (AHIMS) database was undertaken on 24 May 2021, using a 200 metre buffer around the proposal area. The search indicates that there are no registered Aboriginal sites, objects or places present in, or within 200 metres of, the proposal area.

Site visit

A site visit was undertaken on 1 May 2020. Photos of the proposal area (Photo 2-1- Photo 2-8) confirms that the area comprises roadways and footpaths, with associated utilities and services, and the King Street rail overbridge. Buildings line the roadways along much of Princes Highway and north of Sydney Park Road, with the railway running under the King Street rail overbridge in the northwest. Sydney Park adjoins Princes Highway and Sydney Park Road.

There is no evidence along the proposal area of any remaining original landscape features, such as sandstone outcrops or exposures, that would indicate the likely presence of Aboriginal objects. The site visit also confirmed that the study area has undergone significant levels of disturbance as a result of land clearing and the construction of the rail corridor, highway and surrounding buildings and infrastructure. It is unlikely that any artefacts or sites have been retained due to the removal of topsoil and modification of the natural topography.

. .4.3 Potential impacts

Construction

All of the proposed work would be carried out in areas that have been subject to extensive ground disturbance associated with urban development. The archaeological potential for the proposal area to contain indigenous artefacts is considered to be low.

In accordance with the *Due diligence code of practice for the protection of Aboriginal objects in New South Wales* (DECCW, 2010), it is assessed that no further Aboriginal heritage investigations are required, and works can proceed with caution noting the safeguards and management measures specified in Section 6.4.4.

Operation

The operation of the proposal would not result in any impact to Aboriginal heritage.

6.4.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Aboriginal heritage	*The Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport for NSW does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design/pre-construction	Core safeguard AH1 Section 4.9 of QA *G36 Environment Protection*

6.5 Contaminated land

An assessment was carried out to identify the extent and magnitude of contamination within the proposal area. The *Sydney Park Junction Stage 1 Contamination Assessment* (Jacobs, 2021c) is provided in Appendix G. A summary of the assessment is presented in this section, together with safeguards and management measures to mitigate any negative impacts.

6.5.1 Methodology

The study area of the contamination assessment was defined as the proposal area and land within one kilometre of the proposal area.

The Stage 1 contamination assessment involved:

- A site inspection, conducted on 1 May 2020 and 11 May 2021, focussing on those areas likely to be affected by construction activities.
- Review of available information relating to the physical environment within and around the proposal area, including land uses, topography, geology, hydrogeology, soils and surface waters
- Obtaining an Environmental Risk and Planning Report LS011880 EP (Lotsearch, 7 April 2020) for the proposal area
- Review of historical aerial photography and maps as contained within the Lotsearch (April 2020) report
- Review of publicly available information as contained within the Lotsearch (April 2020) report, NSW Environment Protection Authority (NSW EPA) databases, NSW Department of Primary Industries (DPI) Office of Water licensed groundwater bore database and the Sydney and Marrickville LEPs, amongst others
- Review of publicly available information available via general internet searches for the key words (contamination, remediation and site investigation) for suburbs and major projects within and adjoining the proposal area
- Review of recent and historic reports relevant to contamination and/or intrusive ground investigations undertaken within and around the proposal area
- Identification and description of Areas of Environmental Interest (AEI's).

Based on the assessment findings, recommendations were made about the need for further contamination investigations and included recommendations for sampling and testing of soils at certain locations.

Contamination guidelines

The contamination assessment did not include any ground investigations, sampling or testing of soils and was carried out in accordance with the following NSW EPA guidelines:

- *Managing Land Contamination: Planning Guidelines State Environmental Planning Policy (SEPP) 55 – Remediation of Land* (Department of Urban Affairs and Planning, 1998)
- *Guidelines for Consultants Reporting on Contaminated Sites* (Office of Environment and Heritage, 2011)
- *National Environment Protection (Assessment of Site Contamination) Measure 1999* (as revised 2013) (ASC NEPM) (National Environment Protection Council, 1999)
- *PFAS National Environmental Management Plan Revision 2.0* (Heads of EPAs Australia and New Zealand, 2020).

Should further investigations, remediation work and validation be carried out, these activities would be carried out in accordance with the following guidelines or other appropriate/endorsed guidelines available at the time of writing:

- Guidelines made or approved under Section 105 of the CLM Act, including:
    - Contaminated Sites: Sampling Design Guidelines (EPA, 1995)
    - Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd Edition) (EPA, 2017)
    - Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination (DEC, 2007)
    - Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA, 2015).
- Australian Standard (AS 4482.1-2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*
- Australian Standard (AS 4482.2-1999) *Guide to the sampling and investigation of potentially contaminated soils – Volatile substances*
- *Managing asbestos in or on soil* (WorkCover NSW, 2014)
- *Technical Note: Light Non-Aqueous Phase Liquid Assessment and Remediation* (EPA, 2015)
- *Information for the assessment of former gasworks sites* (DEC, 2005)
- *Vapour Intrusion: Technical Practice Note* (DECW, 2010)
- *Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases* (EPA, 2012)
- *Best Practice Note: Landfarming* (EPA, 2014)
- *Acid Sulfate Soil Assessment Guidelines* (ASSMAC, 1998)
- *Guidelines for the Management of Acid Sulfate Materials* (RTA, 2005)
- *Waste Classification Guidelines* (EPA, 2014)
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000)
- *Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008* (DECCW, 2009)

High-level prioritisation exercise

A high-level prioritisation exercise was carried out to assist in assessing the potential impact from construction and operation to expose contamination to human and/or ecological receptors. The exercise considered source-pathway-receptor relationships consistent with a conceptual site model as defined by the ASC NEPM. The prioritisation exercise considered the following:

    - Contamination severity and extent
    - Known or potential sources of contamination and likely potential contaminants of concern
    - The type of potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air)
    - Approximate spatial distribution of potential contamination, and proximity to the site (e.g. within the study area)
    - The nature of construction and operational activities of the proposal (e.g. surface disturbance, cut-and-fill areas) and whether such activities would expose known or potential areas of contamination.

- Pathways and receptors**:**
    - Assessment of potential pathways from a contamination source to a receptor without safeguards and management measures. Pathways were considered to include dust generation, vapour/gas emissions, excavation and disposal or reuse of soils, extraction and disposal or reuse of groundwater from dewatering or drainage, migration of groundwater via

preferential pathways and surface water erosion. It was assumed that where construction or operational activities would expose known or potential areas of contamination, the exposure pathways to construction workers could be complete. Where construction or operational activities are located within and/or adjacent to sensitive environmental receptors, pathways could exist as a result of uncontrolled site discharges during construction

- Potential human and ecological receptors (including location, and potential for primary or secondary contact with contamination). Potential receptors were considered to comprise project construction workers and visitors, operational site users, the general public and nearby residents and commercial workers in the surrounding land use, intrusive maintenance workers, receiving water bodies and ecological receptors. Exposure pathways to these receptors were considered to include direct dermal contact (der), ingestion (ing) or inhalation (inh) by human receptors and uptake by aquatic flora and intake by aquatic fauna.

Based on this prioritisation exercise, AEI's were categorised into five categories of contamination potential (very low, low, moderate, high and very high) representing potential impacts during construction and operation without safeguards and management measures. The matrix used for categorising potential impacts from construction and operation is provided in Table 6-34.

The categories of potential contamination impact to construction or operational activities represent a qualitative assessment. Although not definitive, examples of the contamination status represented by the categories is provided below:

- *Very low to low impact* could represent smaller volumes of contaminated materials, likely to be limited to surface soils, with pathways readily managed with typical soil and water controls and personnel protective equipment (PPE), and readily remediated by standard construction methods and management measures
- *Moderate impact* could represent larger volumes of contaminated materials, with pathways readily managed with typical soil and water controls and personnel protective equipment (PPE) and readily remediated by standard construction methods or smaller volumes of more complex contamination which may require specialised remediation methods and specialised management measures for pathways and/or administrative controls during operation
- *High to very high impact* could represent more significant exposure risks, contaminated groundwater and gas/vapours, increased quantum of contaminated materials and wider contamination extent requiring remediation and specialised remediation methods. Pathways may require specialised management measures for example, positive pressure tents, odour control and/or engineering controls during operation.

Table 6-34 Contamination impact potential matrix

Pathways and receptors	Contamination severity and extent				
	SE1 Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE2** Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE3** Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	**SE4** Known contamination present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE5** Known contamination present in the media of concern at concentrations above the relevant assessment criteria and widespread
PR1 Media of concern is unlikely to coincide with or otherwise impact on the proposal AND/OR No or unlikely exposure pathway for human or ecological receptor's during construction and/or operation	Very low	Low	Low	Moderate	Moderate
PR2 Media of concern may intersect the proposal AND Exposure pathway for human or ecological receptors could be present and complete during construction and/or operation	Low	Moderate	Moderate	High	High
PR3 Media of concern would intersect the proposal AND Exposure pathway for human or ecological receptors could be present and complete during construction and/or operation	Moderate	Moderate	High	High	Very high

6.5.2 Existing environment

Historical aerial photography and maps

Aerial photographs were reviewed for the years 1930, 1943, 1951, 1955, 1961, 1965, 1970, 1982, 1991, 2000, 2007, 2014 and 2019. These photographs indicate that the proposal area generally comprised of formalised roadways since the 1930's, with very little changes since then. Changes include the construction of a service station at the intersection of Barwon Road with Princes Highway in the 1960's and the extension of the eastern portion of Sydney Park Road to Euston Road in the 1990's.

Historical maps reviewed indicate that land use in the surrounding area became increasingly commercial/industrial from 1917 until 2000. Quarrying, brickmaking and pottery works were major features of the local urban landscape during the 1930's, with quarrying pits located at the eastern portion of Sydney Park Road (east of Mitchell Road), the intersection of Sydney Park Road and King Street and to the north, east and south of the proposal area.

The conversion of quarry pits into landfill sites is evident from the 1950's until 2007, when the remaining quarry pits to the south of the site (south of Campbell Street) were filled. Sydney Park was developed as parklands over the former landfill and brickworks sites from the 1990's.

In the 1960's, an electrical substation was constructed north of Sydney Park Road, near its intersection with the Princes Highway. Since 2000, additional facilities have been constructed within Sydney Park and commercial/industrial premises in the surrounding area have been demolished to allow for the construction of high density residential buildings. The construction of the St Peters Interchange commenced in 2019 on the former landfill site to the south of Campbell Road, as part of the WestConnex Stage 2 works.

NSW EPA Contaminated Sites Register

A search of the NSW EPA Contaminated Sites Register and Record of Notices indicates that there are 11 sites registered with the NSW EPA within 500 metres of the proposal area that were either regulated, formerly regulated or had been notified. These sites are summarised in Table 6-35.

Two sites within 500 metres of the proposal are currently regulated by the NSW EPA (i.e. contamination is considered significant enough to warrant regulation). These sites and respective contamination are as follows:

- Sydney Park (adjacent to proposal) – Landfill gas (methane and carbon dioxide)
- Alexandra Canal (310 metres south east of proposal) – Sediments (chlorinated hydrocarbons and metals).

Landfill gas has the potential to migrate from Sydney Park which could pose a potential risk to construction activities and/or operation of the proposal. The Alexandra Canal site is currently subject to a remediation order and is unlikely to impact upon construction and/or operation of the proposal.

Table 6-35 EPA registered sites within 500 metres of the proposal area

Site	Suburb	Notified site address	Notified site activity	Contamination status	Location relative to proposal
1	Alexandria	Sydney Park Road	Landfill	Contamination currently regulated under CLM Act	Onsite
2	Alexandria	Off Huntley Street	Other Industry	Contamination currently regulated under CLM Act	310 metres (south east)
3	Alexandria	1B Maddox Street	Landfill	Regulation under CLM Act not required	493 metres (east)
4	Erskineville	1A Coulson Street	Other Petroleum	Regulation under CLM Act not required	95 metres (north east)
5	Erskineville	Coulson Street	Other Industry	Regulation under CLM Act not required	207 metres (north)
6	Erskineville	Coulson Street	Other Industry	Regulation under CLM Act not required	328 metres (north east)
7	Erskineville	36/1A Coulson Street	Other Industry	Regulation under CLM Act not required	342 metres (north)
8	St Peters	2 Princes Highway	Service Station	Regulation under CLM Act not required	Onsite
9	St Peters	53 Barwon Park Road	Chemical Industry	Contamination formerly regulated under the CLM Act	121 metres (south)
10	St Peters	May Street	Other Industry	Regulation under CLM Act not required	166 metres (west)
11	St Peters	75 Mary Street	Other industry	Regulation under CLM Act not required	489 metres (south west)

Contamination investigations

A review of previous contamination investigations and/or general contamination information for sites located within and/or within one kilometre of the proposal area is provided in Appendix G (Section 6.8).

Potential areas of environmental interest

A number of potential AEI's were identified during the information review and site investigation as detailed in Table 6-36 and shown in Figure 6-15. Table 6-36 also outlines associated risks to environmental receptors, construction limitations, and site users in consideration of the potential for contamination and proposed construction activities. AEI's within the proposal area are shown in bold.

A number of moderate to high risk areas have been identified that have the potential to impact upon construction and operation of the site. Additional information would need to be obtained and reviewed (such as site-specific data) or further investigations need to be undertaken in order to determine the most appropriate site-specific responses or controls.

Table 6-36 Areas of environmental interest and qualitative contamination risk assessment

Identifier	Area of interest	Location	Potential contamination source and contaminants of concern	Risk ranking	Comments
AEI1	Historical quarrying and brickmaking activities	**Within proposal area** (Eastern portion of Sydney Park Road and intersection of Sydney Park Road and King Street) and adjacent to the proposal area (north and south)	Soils (surface and depth) - Heavy metals, hydrocarbons (Total Recoverable Hydrocarbons (TRH), Polycyclic Aromatic Hydrocarbons (PAH)), asbestos	High	Potential sources of contamination associated with historical quarrying and brickmaking activities include heavy metals, hydrocarbons (TRH, PAH) and asbestos. There is a high risk for construction workers to come into contact with contaminated soils during excavations and for people in the vicinity of construction activities to be exposed to asbestos-contaminated dust.
AEI2	Historical filling (soil and rock material of unknown quality, wastes)	**Within proposal area** (Eastern portion of Sydney Park Road)	Soils (surface and depth) - Heavy metals, hydrocarbons (TRH, PAH), pesticides, polychlorinated biphenyls (PCB), phenols, asbestos	High	Historical filling within the eastern portion of Sydney Park Road potentially involved the use of material of unknown quality that represent a potential source of contaminants such as heavy metals, hydrocarbons (TRH, PAH), pesticides, PCB, phenols and asbestos. There is a high risk for construction workers to come into contact with contaminated soils during excavations and for people in the vicinity of construction activities to be exposed to asbestos-contaminated dust.
AEI3	Historical landfilling (Sydney Park and St Peters interchange - Known areas of waste and gas contamination)	**Within proposal area** (eastern portion of Sydney Park Road) and adjacent to site	Waste - Heavy metals, hydrocarbons (TRH, benzene, toluene, ethylbenzene and xylenes (BTEX), PAH), pesticides, PCB, per- and poly-fluoroalkyl substances (PFAS), asbestos	High	Potential sources of contamination associated with historical landfilling include household and industrial waste that represent a potential source of contaminants such as heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, PCB, PFAS and asbestos. Decomposing material may also lead to the release of toxic vapours and landfill gases (such as methane,

Identifier	Area of interest	Location	Potential contamination source and contaminants of concern	Risk ranking	Comments
			Groundwater - Nutrients, heavy metals, hydrocarbons (TRH, BTEX, PAH), volatile organic compounds (VOCs), PFAS	Low	hydrogen sulphide, carbon dioxide and VOCs). These vapours and gases may accumulate within below ground excavations, structures and services. There is a high risk for construction workers to come into contact with contaminated soils during excavations and for construction workers and people in the vicinity of construction activities to be exposed to landfill gases and vapour emissions. Since the depth of construction activities is likely to be relatively shallow, contaminated groundwater is unlikely to be encountered.
			Vapour and landfill gas - Methane, hydrogen sulphide, carbon dioxide, VOCs	High	
AEI4	Service Station (2 Princes Highway, St Peters) – Leaks from underground petroleum storage tanks and associated refuelling infrastructure	Adjacent to proposal area (corner of Princes Highway and Barwon Park Road)	Soils (surface and depth) - Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Low	Potential contamination associated with the service station include potential impacts to soil and groundwater and the release of toxic vapours as a result of leakages, spills and/or failure of underground storage systems and associated infrastructure. Potential contaminants include heavy metals, hydrocarbons (TRH, BTEX, PAH), VOCs, SVOCs and PFAS. The proposal would require excavations next to the service station and not within the service station footprint. Soil contamination is unlikely to migrate from the site into the proposal area during construction. Vapour contamination impacts to adjoining areas could be present at depth in groundwater and possible vapour portioning from groundwater. Volatile compounds in vapour (if present) may need to be managed during construction activities and operation.
			Groundwater - Heavy metals, hydrocarbons (TRH, BTEX, PAH), VOCs, semi-volatile organic compounds (SVOCs), PFAS	Low	
			Vapour - VOCs	Moderate	

Identifier	Area of interest	Location	Potential contamination source and contaminants of concern	Risk ranking	Comments
AEI5	Former and existing structures – Hazardous building materials within or from on-site buildings / structures, demolition wastes	**Within proposal area** (Eastern portion of Sydney Park Road and intersection of Sydney Park Road and King Street) and adjacent to site	Surface soil - Heavy metals, hydrocarbons (TRH, PAH), pesticides, asbestos	Moderate	Inappropriate management (during demolition) and/or degradation of hazardous building materials within existing and former on-site structures represent potential sources of contaminants such as heavy metals, hydrocarbons (TRH, PAH), pesticides and asbestos within surface soil. There is a moderate risk for construction workers to come into contact with contaminated soils during excavations and for construction workers and the general public in the vicinity of construction activities to be exposed to contaminated dust.
AEI6	Historical commercial / industrial use within locality – Inappropriate chemical storage and use, industrial operations, waste disposal and management etc	Adjacent to proposal area	Surface soil - Heavy metals, hydrocarbons (TRH, PAH), pesticides, PCB, SVOCs, phenols, PFAS and other organic contaminants.	Low	Historical commercial and industrial activities that involved the manufacture, use and disposal of chemicals represent potential sources of contaminants such as heavy metals, hydrocarbons (TRH, PAH), pesticides, PCB, volatile compounds, phenols and PFAS. There is low potential for surface soil contamination to migrate to the proposal area and for construction workers to be exposed to contaminated soils. Contaminated groundwater is unlikely to be encountered since the depth of construction activities is likely to be relative shallow.
			Groundwater - Heavy metals, hydrocarbons (TRH, BTEX, PAH), VOCs, SVOCs, PFAS	Low	

Identifier	Area of interest	Location	Potential contamination source and contaminants of concern	Risk ranking	Comments
AEI7	St Peters Substation – Leakage of transformer oils and potential firefighting activities and aqueous film-forming foam storage	Adjacent to proposal area – western portion of Sydney Park Road	Soils – Hydrocarbons and PCBs	Low	Substations represent potential sources of hydrocarbons, PCB and PFAS due to the known historical use of PCB based transformer oil and the historical use of aqueous film forming foam (containing PFAS) during firefighting activities. The excavations associated with the proposal are expected to take place next to the former substation and not directly within the substation footprint. There is low potential for surficial contamination to migrate and be exposed during construction. Deeper groundwater is unlikely to be encountered since the depth of construction activities is likely to be relatively shallow.
			Groundwater - PFAS	Low	
AEI8	Chamber Substation (Sydney County Council Electric Substation No. 549) – Leakage of transformer oils	Adjacent to proposal area – Princes Highway	Soils – Hydrocarbons and PCBs	Low	Substations represent potential sources of hydrocarbons and PCBs due to the known historical use of PCB based transformer oil. Excavations associated with the proposal are expected to take place next to the former substation and not directly within the substation footprint. There is low potential for surficial contamination to migrate and be exposed during construction. Since the depth of construction activities is likely to be relatively shallow, groundwater is unlikely to be encountered.

Identifier	Area of interest	Location	Potential contamination source and contaminants of concern	Risk ranking	Comments
AEI9	Mechanical workshops (Motociclo and Graeme Cooper Automotive)	Adjacent to proposal area – Princes Highway	Surface soil - Heavy metals, hydrocarbons (TRH, BTEX, PAH), SVOCs, VOCs	Low	Hazardous substances (e.g. oils, chemicals, solvents and cleaning fluids) used in mechanical workshops represent potential sources of heavy metals, hydrocarbons (TRH, BTEX, PAH) and volatile compounds that could contaminate soils and groundwater. There is low potential for surface soil contamination to migrate and be exposed during construction. Since the depth of construction activities is likely to be relatively shallow, groundwater is unlikely to be encountered.
			Groundwater - Heavy metals, hydrocarbons (TRH, BTEX, PAH), SVOCs, VOCs	Low	
AEI10	Industrial workshop (Cheapest Load of Rubbish) - General maintenance activities and storage of equipment, storage and use of chemicals	Adjacent to proposal area - corner of Goodsell Street and King Street	Surface soil - Heavy metals, hydrocarbons (TRH, PAH), VOCs and SVOCs	Low	Hazardous substances (e.g. oils, chemicals, solvents and cleaning fluids) used in industrial workshops represent potential sources of heavy metals, hydrocarbons and volatile compounds that could contaminate soils and groundwater. There is low potential for surface soil contamination to migrate and be exposed during construction. Since the depth of construction activities is likely to be relatively shallow, groundwater is unlikely to be encountered.
			Groundwater - Heavy metals, hydrocarbons (TRH, BTEX, PAH), VOCs, SVOCs	Low	

Figure 6-15 | Contaminated sites
King Street Gateway

Figure 6-15 Contaminated sites

Acid sulfate soils

Acid sulfate soils (ASS) are soils and sediments containing iron sulphides that, when disturbed and exposed to oxygen, generate sulphuric acid and toxic quantities of aluminium and other heavy metals. The majority of ASS are formed by natural processes and can typically be found in low lying sections of coastal floodplains, rivers and creeks where surface elevations are less than about five metres Australian Height Datum (AHD).

ASS Risk Maps from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Australian Soil Resource Information System (ASRIS) database were reviewed to ascertain the probability of ASS being present across the proposal area. Based on this information, the proposal area is assessed as having an extremely low probability of ASS presence.

A review of ASS risk maps from the Sydney LEP and the Marrickville LEP indicates that Class 3 ASS are likely to be found in the eastern section of Sydney Park Road, with the remainder of the proposal area mapped as having the potential to contain Class 5 ASS, as shown in Figure 6-16. Class 1 and Class 2 ASS are likely to occur within 500 metres of the proposal.

Clause 7.14 (2) of the Sydney LEP and clause 6.1 (2) of the Marrickville LEP provide the following definitions for Class 3 and Class 5 ASS:

- Class 3: Works more than one metre below the natural ground surface. Works by which the water table is likely to be lowered more than one metre below the natural ground surface
- Class 5: Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below five metres AHD and by which the water table is likely to be lowered below one metre AHD on adjacent Class 1, 2, 3 or 4 land.

Groundwater

The Lotsearch (April 2020) report search of the NSW DPI Office of Water registered groundwater bore database and the Bureau of Meteorology National Groundwater Information System indicates that there are 41 registered groundwater bores within 500 metres of the proposal area. A summary of key information for these bores are provided in Section 6.6.2. No registered groundwater bores were identified to be located within the proposal area.

All bores identified within the 500 metre buffer, except bores GW111164 (domestic) and GW100053 (recreation), are registered as monitoring bores and as such are unlikely to represent beneficial groundwater use (e.g. potable water supply or irrigation supply). The actual and specific use of bores GW111164 and GW100053 is not understood. Based on the local topography and the location of the nearest surface water body (i.e. Alexandria Canal located to the south and south west of the site), bore GW111164 is likely to be located hydraulically up gradient of the site. Bore GW100053 within Sydney Park is likely to be located hydraulically down gradient of the site and could be impacted by contamination (if present) mobilised during construction.

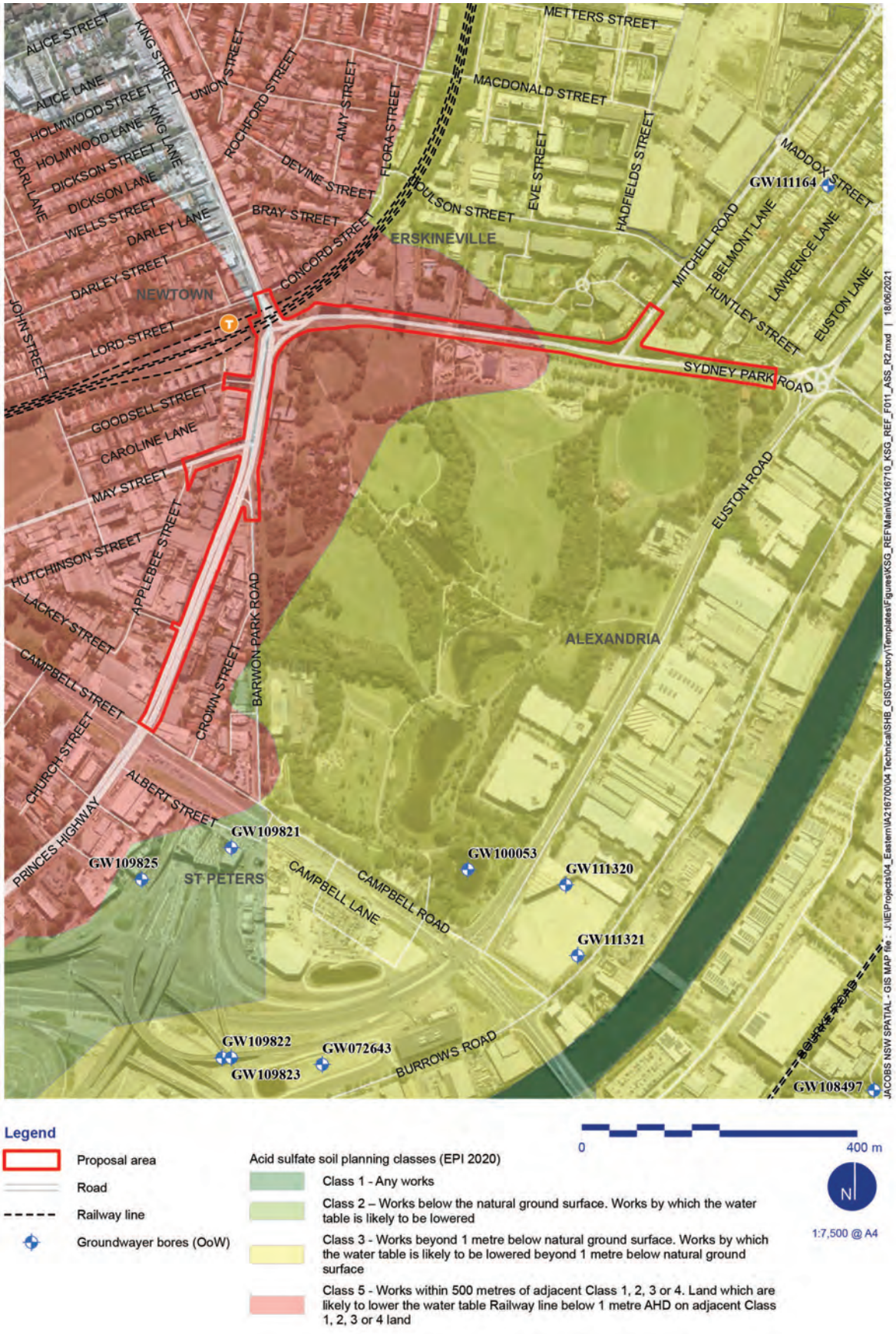

Figure 6-16 Acid sulfate soil risk

Site inspection

An inspection of the proposal area and its surrounding environment was undertaken on 1 May 2020. The proposal area consists of existing roadways and is surrounded by low to high density residential and commercial/retail land uses, open space (Sydney Park), roadways (including the St Peters Interchange) and the railway line (T2 Inner West and Leppington Line).

Ancillary facility sites

An inspection of the ancillary facility sites at Venice Street, Mascot and 12-18 Burrows Road, St Peters was undertaken on 11 May 2021. The sites were inspected from publicly accessible areas. Both sites were predominantly concrete, and asphalt sealed vacant parcels of land. The site at Venice Street is surrounded by vacant land (vegetated open space) and Gardeners Road to the north, commercial/industrial premises to the east and south and Alexandria Canal to the west. The site at Burrows Road is surrounded by vacant land (vegetated open space) and Ricketty Street / Canal Road to the north, Alexandria Canal to the east, commercial/industrial premises to the south, commercial/industrial premises and vacant land (vegetated open space) to the west.

At both ancillary facility sites, no evidence of potential contamination sources (e.g. wastes, material stockpiles, chemical storage, above or underground petroleum storage systems, above ground structures containing hazardous building materials) were observed to be present at the site.

6.5.3 Potential impacts

Construction

As summarised in Table 6-36, there are four AEI's within the proposal area that present a moderate to high contamination risk to construction activities, construction site workers and the surrounding environment during construction.

Acid Sulfate Soils

The Stage 1 contamination assessment (Jacobs, 2021c) concluded that ASS risks could be encountered in the eastern section of Sydney Park Road (mapped as having the potential to contain Class 3 ASS) during the following construction works:

- any works which extend beyond one metre below the natural ground surface or that could lower the water table beyond one metre below the natural ground surface
- any works which could lower the water table below one metre AHD on the adjacent Class 3 areas.

Construction activities as detailed above could results in the oxidation of potential ASS (where present) which could cause acidification and increased mobilisation of contamination (namely heavy metals). All soils excavated as part of these construction activities would be tested for the presence of ASS. Soils considered to be or confirmed as ASS would be managed in compliance with an ASS Management Plan. This plan would be prepared in accordance with the requirements of the Roads and Maritime Services *Guidelines for the Management of Acid Sulfate Materials* (RTA, 2005) and Acid Sulfate Soil Management Advisory Committee (ASSMAC) *Acid Sulfate Soils Manual* (Stone, Ahern & Blunden, 1998). With the implementation of the ASS Management Plan, the risks of impacts from ASS would be low.

Groundwater contamination

Contaminated groundwater is unlikely to be encountered during construction considering the depth of the proposed excavation works (1.5 to 1.8 metres below ground level). The potential for construction activities to result in the contamination of groundwater, as well as relevant safeguards and management measures, are discussed in Section 6.6.

Vapour and gas contamination

Vapours are generally partitioned from volatile compounds present within soil and groundwater. The generation of vapours can be influenced by sub-surface conditions and the presence of below ground and surface structures. Vapours have the potential to accumulate within excavations and enclosed structures associated with the site at concentrations which could represent an explosion or acute/chronic health risk.

Sources of hazardous ground gas can include putrescible waste and inert waste landfill sites, general uncontrolled fill, reclaimed wetlands and mangroves, organic waste disposal, coal workings, and other natural/anthropogenic sources. The migration and behaviour of hazardous ground gases are subject to physical processes including advection, diffusion, and dissolved phase transport.

Potential vapour and landfill gas sources have been identified next to the proposal area in Sydney Park and at the service station at the intersection of Princes Highway and Barwon Park Road.

Hazardous / explosive ground gases and vapours could accumulate within subsurface features (e.g. service trenches) constructed as part of the proposal at concentrations which could represent an asphyxiation or explosion risk. Ground gases may also cause odour issues that can affect sensitive receivers in areas surrounding the site. This may be particularly prevalent during the excavation of waste materials.

Additional information reviews and investigations would have to be undertaken as specified in the soil contamination section below to manage impacts from vapours and gases.

Soil contamination

The assessment has identified areas across the site which have a moderate to high potential for contamination impact as a result of the following:

- On-site: Historic landfilling/filling activities, (brick making) and associated structures (degradation of hazardous building materials) and current (service station) land use
- Off-site: Historic structures (degradation of hazardous building materials)

Potential impacts as a result of disturbance of contaminated fill and soil without appropriate management and/or remediation may include:

- Contaminant exposure risk to construction personnel and the general public
- Contaminant exposure to environmental receptors
- Cross contamination associated with the incorrect handling or disposal of spoil/unexpected finds
- Contamination of previously clean areas.

Should contaminated fill materials and soil be identified, these materials can be managed subject to the implementation of appropriate management measures and/or remediation.

Higher risks and increased management and/or remediation effort during construction could be associated where materials have the potential to:

- Contain dispersible fibres (e.g. asbestos)
- Generate vapours (e.g. hydrocarbons and volatile organic compounds)
- Contain concentrations of contaminants or constituents that categorise the material at a higher waste classification (e.g. restricted waste, special waste, hazardous waste).

Additional information reviews (where information is available) and investigations should be completed prior to construction to determine appropriate management measures and/or remediation measures.

Any fill materials and/or soils disturbed as part of site construction activities have the potential to become mobilised into stormwater drainage networks during rainfall events if not appropriately managed. As such there is potential for on-site fill materials and/or soils disturbed as part of construction to migrate and impact off-site receiving environments.

Operation

Groundwater contamination

The site is proposed to be operated as roadways and cyclist and pedestrian pathways. The proposed use of the site is unlikely to generate groundwater or cause groundwater contamination.

Vapour and gas contamination

The accumulation of hazardous ground gases or toxic vapours within below ground structures (e.g. service trenches and pit) during operation could lead to potential explosion and/or asphyxiation risks during operation of the proposal.

Although not associated with the operation of the project, potential vapour and landfill gas sources are present adjacent to the site which could accumulate in sub-surface features constructed as part of the proposal. Potential vapour and landfill gas sources identified as part of this assessment include:

- Sydney Park
- Service Station (2 Princes Highway, St Peters).

Soil contamination

The results of this assessment have identified areas across the site which have a moderate to high potential for contamination impact as a result of historic landfilling/filling activities, commercial/industrial use and degradation of hazardous building materials from structures on and/or adjacent to the site. These materials have the potential to impact site users, site staff, the general public, and local ecology through direct exposure if they remain on-site or have migrated from the site as part of operation. Appropriate mitigation and management measures would be implemented in construction and operation to prevent this.

The site is proposed to be operated as roadways and pedestrian access. The proposed use of the site is unlikely to cause soil contamination.

Acid Sulfate Soils (ASS)

The site is proposed to be operated as roadways and pedestrian access. The proposed use of the site is unlikely to expose Acid Sulfate Soils (ASS).

6.5.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Contaminated land – moderate/ high risk areas	For areas that have been identified as having a moderate or high contamination impact potential (within and adjacent to Sydney Park at the Service Station at 2 Princes Highway), undertake a further data review where relevant information is available. If the additional data review confirms that contamination is likely to have a very low or low impact potential, manage these areas in accordance with the Soil and Water Management Plan. This would typically occur where there is minor, isolated contamination that can be readily remediated through standard construction practices such as excavation and off-site disposal.	Transport for NSW	Detailed design/ Pre-constructi on	Additional safeguard CL1

Impact	Environmental safeguards	Responsibility	Timing	Reference
Contaminated land	Where data from the additional review (CL1) is insufficient to understand the contamination impacts, undertake a Detailed Site Investigation (Stage 2 assessment) (DSI) in accordance with the NEPM (2013) and other EPA guidelines. The areas requiring Detailed Site Investigation would be confirmed by the additional data review (CL1).	Transport for NSW	Detailed design/Pre-construction	Additional safeguard CL2
Contaminated land	Develop a Contamination Management Plan (CMP) for the area of the construction footprint if data from the additional data review (CL1) or the Detailed Site Investigation (CL2) confirms a moderate to very high potential for contamination impacts. The CMP would detail the management works required to mitigate impacts from contamination throughout and following completion of construction. The CMP would be prepared in accordance with relevant NSW EPA guidelines and where applicable, detail management methodologies in accordance with Australian Standards and other relevant government guidelines and codes of practice. Management would be performed as an integrated component of construction and to a standard commensurate with the proposed end use of the land. The requirements for a CMP would be confirmed following the additional data review (CL1) and Detailed Site Investigation (CL2).	Transport for NSW	Detailed design/Pre-construction	Core standard safeguard CL3 Section 4.2 of *QA G36 Environment Protection*
Contaminated land	Further investigations for waste classification are recommended to obtain thorough data	Contractor	Detailed design/Pre-construction	Additional safeguard CL4

Impact	Environmental safeguards	Responsibility	Timing	Reference
Contaminated land	The Contamination Management Plan (CMP) should be prepared in accordance with the *Guideline for the Management of Contamination* (Roads and Maritime, 2013) and implemented as part of the CEMP. The plan should include, but not be limited to: • Capture and management of any surface runoff contaminated by exposure to the contaminated land • Further investigations required to determine the extent, concentration and type of contamination, as identified in the Detailed Site Investigation (CL2) • Management of the remediation and subsequent validation of the contaminated land, including any certification required • Measures to ensure the safety of site personnel and local communities during construction • Ongoing monitoring measures during construction.	Contractor	Detailed design/Pre-construction	Core standard safeguard CL5 Section 4.2 of QA *G36 Environment Protection*
Unexpected finds	If contaminated areas (not previously identified) are encountered during construction, implement appropriate control measures to manage the immediate risks of contamination. Cease all other work that may impact on the contaminated area until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport for NSW Environment Manager and/or EPA.	Contractor	Construction	Core standard safeguard CL6 Section 4.2 of QA *G36 Environment Protection*

Impact	Environmental safeguards	Responsibility	Timing	Reference
Accidental spills	Develop spill management measures in accordance with the *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines and include the measures in the Soil and Water Management Plan. Measures should include, but not be limited to: • Store chemicals and fuels within an impervious bunded area • Protect downstream drains prior to refuelling taking place • Ensure all operators and delivery drivers undertaking refuelling are trained in the site refuelling procedure • All refuelling of vehicles and equipment would be undertaken off site or within an impervious bunded area at the compound site at least 40 metres from drainage lines. Where this cannot occur, mobile fuel trucks should be equipped with a self-bunded tank, spill prevention equipment and spill kits • Requirement for an emergency spill kit to be kept on site at all times and be easily accessible and staff awareness and training in its use • Removal of contaminated material (soils, water, clean up materials) offsite by a licensed contractor and disposed of at an appropriately licensed facility.	Contractor	Detailed design/Pre-construction	Core standard safeguard CL7 Section 4.3 of QA *G36 Environment Protection*
Removal of excavated material	Classify all waste material excavated and removed from the proposal area in accordance with the NSW *Waste Classification Guidelines* (EPA, 2004)	Contractor	Construction	Additional safeguard CL8
Acid Sulfate Soils	Prepare and implement an ASS Management Plan in accordance with the Roads and Maritime Services Guidelines for the Management of Acid Sulfate Materials (RTA, 2005) a nd the ASSMAC *Acid Sulfate Soils Manual* (Stone, Ahern & Blunden, 1998) as part of the CEMP for the following works within the eastern portion of Sydney Park Road: • any works which extend beyond one metre below the natural ground surface or that could lower the water table beyond one metre below the natural ground surface • any works which could lower the water table below one metre AHD on adjacent Class 3 areas.	Contractor	Pre-construction	Additional safeguard CL9

Impact	Environmental safeguards	Responsibility	Timing	Reference
Remaining contamination during operation	Information about any areas where contamination remains after construction should be documented in an appropriate form and provided to the relevant council for potential inclusion into the OEMP. This would include areas where the potential for vapour and ground gas emissions remains.	Transport for NSW	Construction	Additional safeguard CL10

Other safeguards and management measures that would address contamination impacts are identified in Section 6.6 (Flooding and hydrology).

6.6 Flooding and hydrology

A flooding assessment was completed for the proposal to identify strategies to manage impacts to flooding during construction and operation. The assessment is presented in the WP 10 Sydney Park Junction Flooding Assessment Technical Paper (Jacobs, 2021d) and is provided in full in Appendix H and summarised below.

6.6.1 Methodology

The flooding assessment was carried out in accordance with the following guidelines and design references:

- *NSW Floodplain Development Manual* (NSW Government, 2005)
- *Australian Rainfall and Runoff* (ARR) 2019 (Geoscience Australia, 2019)
- *Alexandra Canal Floodplain Risk Management Study and Plan* (Cardno, 2014)
- Marrickville Local Environment Plan 2011
- Sydney Local Environment Plan 2012.

The study area for the flooding assessment was defined as the proposal area and surrounding land within approximately 500 metres of the proposal area.

The methodology for the flooding assessment involved:

- A review of aerial photography and topographic and land use data to characterise the existing physical attributes of the study area
- A desktop review of available flood study reports relevant to the proposal to characterise existing flooding conditions and drainage patterns in the proposal area and the surrounding area
- A review of additional flooding information including details of historic flooding obtained from City of Sydney Council, Inner West Council and other sources
- A review of the proposed design and performance objectives relevant to drainage and flooding
- Identification and qualitative assessment of potential upstream / downstream flood impacts for the construction and operation phases
- A review of the need for safeguards and management measures.

6.6.2 Existing environment

Catchments and drainage

The topography of the proposal area is described in Section 6.10.1 and shown in Figure 6-17. The proposal area traverses two catchments, the Alexandra Canal catchment, to the east of King Street/Princes Highway, and the Eastern Channel East catchment, to the west of King Street/Princes Highway, as shown in Figure 6-17. Runoff from the Alexandra Canal catchment is conveyed to the Alexandra Canal in the east which discharges into the Cooks River. The Eastern Channel East catchment generally discharges in a westerly direction to the Eastern Channel which also discharges to the Cook River.

The eastern half of the northern section of the proposal area, along Sydney Park Road and King Street, is located within the Munni Street-Erskineville sub-catchment (about 2.1 square kilometres) whereas the western half is located within the East Channel East sub-catchment (1.3 square kilometres). The eastern half of the southern section of proposal area along Princes Highway is located within the Alexandra Canal sub-catchment (about 1.8 square kilometres) whereas the western half is located in within the East Channel East sub-catchment.

The area to the north of Sydney Park Road falls within the Munni Street-Erskineville sub-catchment and drains via an underground stormwater network and overland flows in a south easterly direction. A drainage low point is located at the intersection of Coulson Street and Mitchell Road, 170 metres north of Sydney Park Road. Drainage to the south of Sydney Park Road is via a constructed concrete channel, the Munni Street stormwater channel, which runs through Sydney Park, crosses Euston Road and Burrows Road and discharges to the Alexandra Canal. Sydney Park Road forms a flow path for local runoff that drains to the Munni Street stormwater channel.

King Street/Princes Highway traverses the natural ridgeline, forming two sag points in the road in the vicinity of Goodsell Street and Short Street. Surface water at both sag points drain mainly to the west to the Eastern Channel East catchment, although in large flood events they may also drain to the east to Alexandra Canal catchment. The stormwater network catering for the sag point near Goodsell Street drains to the west, while the stormwater network catering for the sag point near Short Street drains to the east.

Runoff in Sydney Park is generally directed away from the proposal area due to the terrain. In the vicinity of the Sydney Park cycle centre, runoff drains north towards Sydney Park Road. Although some runoff is likely to flow onto Sydney Park Road, the remainder would be intercepted by the underground stormwater network which discharges to a grassed swale to the east of the adjoining car park. From the Sydney Park car park runoff flows eastward and discharges to the Munni Street stormwater channel.

Catchment characteristics

The proposal area consists of the road corridors of King Street/Princes Highway, Sydney Park Road and the intersections with local roads including Mitchell Street, Goodsell Street, May Street and Barwon Park Road and is almost completely impervious. Adjacent areas include commercial and high-density residential properties with generally very high (greater than 90 per cent) levels of imperviousness. There are open space areas at Sydney Park, Camdenville Oval and Simpson Park, consisting mostly of pervious grassed and landscaped areas, as well as some impervious areas such as car parks, paved footpaths and a limited number of buildings.

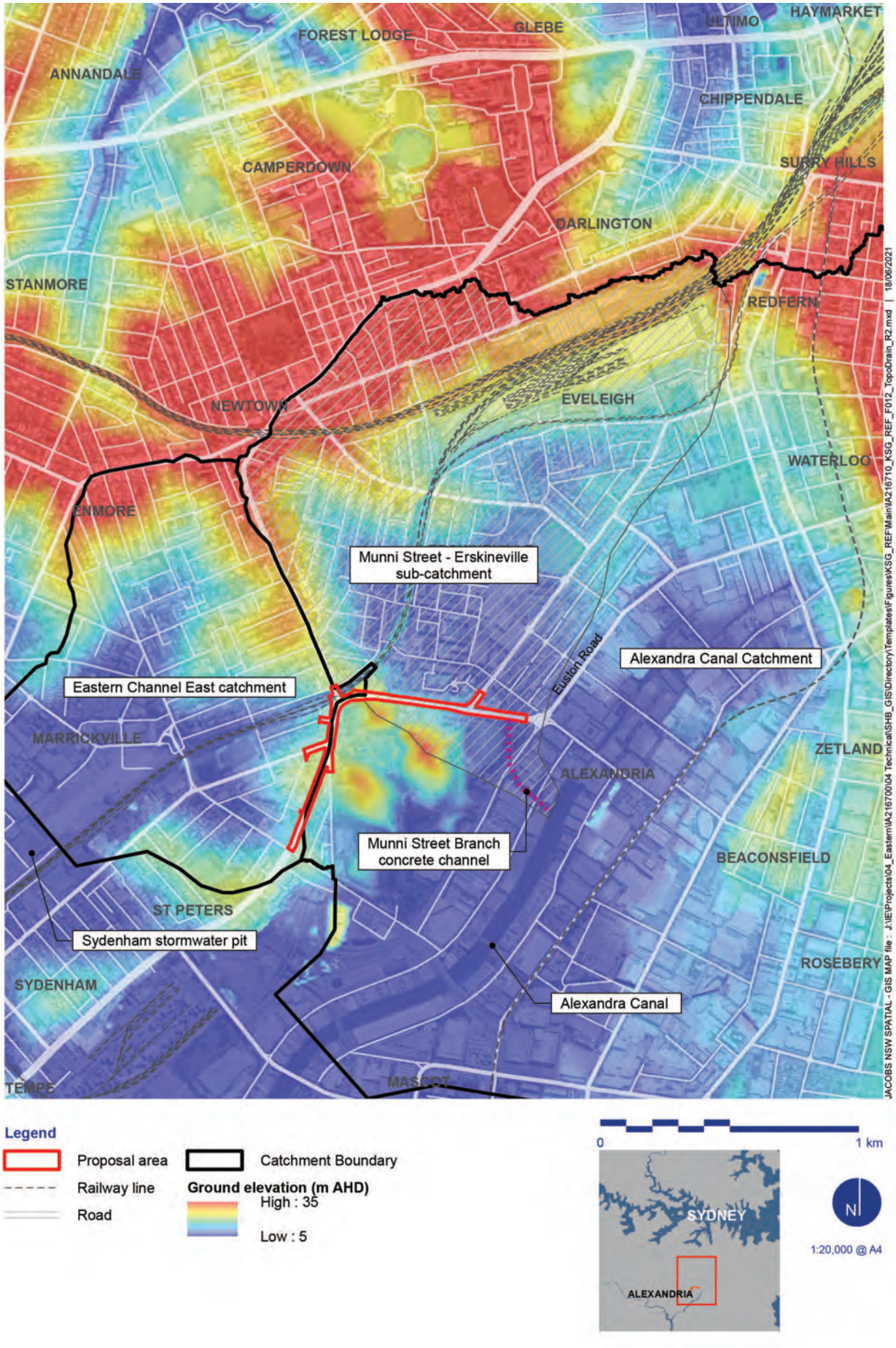

Figure 6-17 Topography and drainage

Flooding

The existing flood depths for the one per cent AEP and probable maximum flood (PMF) flood events across the proposal area are shown in Figure 6-18 and Figure 6-19 respectively.

Sydney Park Road

Most of Sydney Park Road falls within the Munni Street-Erskineville sub-catchment of the Alexandra Canal catchment. Near the Munni Street stormwater channel crossing under Sydney Park Road, a sag point is formed on Sydney Park Road. At the sag point, flood depths reach 0.4 metres in the one per cent AEP flood and 0.6 metres in the PMF. These ponding floodwaters have low velocity. Floodwaters flow over the sag point in Sydney Park Road in a southerly direction. The property on the northern side of the road has recently been redeveloped and floor levels appear to be raised above the one per cent AEP flood level.

Runoff generated in Sydney Park flows onto Sydney Park Road between the Mitchell Road intersection and the sag point, with flood depths reaching 0.1 metres in the one per cent AEP flood and 0.15 metres in the PMF. While the rest of Sydney Park Road is not shown as flood-affected, it is expected that there would be flows in the road gutters which are comprised mainly of runoff from the road surface and adjoining areas. The road drainage system runs east and drains towards the Munni Street stormwater channel.

To the south of Sydney Park Road, floodwaters in the one per cent AEP flood and PMF are generally confined to the Munni Street stormwater channel. During the PMF, floodwaters in the channel reach depths of over two metres and high velocities of two metres per second. Shallow depths of flooding occur on the eastern bank of the stormwater channel in the PMF to depths of 0.2 metres.

Princes Highway/King Street north of Barwon Park Road

The Princes Highway/King Street north of Barwon Park Road falls within the Eastern Channel East catchment. Runoff to the sag point near Goodsell Street is generated mainly in the roadways, including the far western end of Sydney Park Road, King Street south of the railway bridge and Princes Highway/King Street north of Barwon Park Road, in addition to the north western corner of Sydney Park.

Floodwaters pond to depths of 0.2 metres in the one per cent AEP flood and 0.3 metres in the PMF on both sides of the highway. On the eastern side of the highway the buildings on the Sydney Park Brick Kilns heritage site are affected by flooding up to depths of 0.8 metres in the one per cent AEP flood and up to one metre in the PMF, particularly on the eastern side of the buildings. Most of the floodwater is from runoff from the park that flows towards the sag point near Goodsell Street. On the western side of the Brick Kilns buildings, flood depths are up to 0.15 metres in the one per cent AEP flood and 0.2 metres in the PMF.

Shallow floodwaters may affect commercial buildings on the corner of King Street and Goodsell Street, with shallow above-floor flooding (up to 0.1 metres depth) in the one per cent AEP flood. Flood depths in this location reach up to 0.25 metres in the PMF.

Goodsell Street forms an active overland flow path with flows to depths of up to 0.3 metres in the road, footpath and yards of properties in the one per cent AEP flood. There is no underground drainage system in Goodsell Street. The existing Princes Highway pipe drainage system discharges via a headwall into the gutter at the eastern end of Goodsell Street, with the pipe flows combining with road surface flows to form the overland flooding in Goodsell Street.

King Street also contributes to minor overland flows to May Street, although the flows and flood depths are less than in Goodsell Street. The overland flows from Goodsell Street and May Street collect in Council Street, before flowing along the railway line towards the Eastern Channel East catchment outlet at Sydenham Pit.

Flooding is also shown within the portion of the proposal area which overlaps the railway corridor, although the floodwaters are on the railway itself and not on the King Street rail overbridge above.

Princes Highway south of Barwon Park Road

This southern section of the Princes Highway falls on the boundary of the Alexandra Canal catchment and Eastern Channel East catchment. Flooding in the sag point near Short Street is generated in the Princes Highway roadway between Barwon Park Road and Campbell Street in addition to roof runoff from adjacent commercial buildings. The floodwaters build up to depths of 0.5 metres in the one per cent AEP flood in the

sag point. Adjacent commercial properties are likely to be affected by above-floor flooding on the ground floor. Overflows from the sag point occur to depths of 0.2 metres through the yards of commercial properties towards the west into the Eastern Channel East catchment. The sag is drained by a stormwater pit and pipe network, which runs southward to Campbell Street and then east along Campbell Street, discharging to the Alexandra Canal.

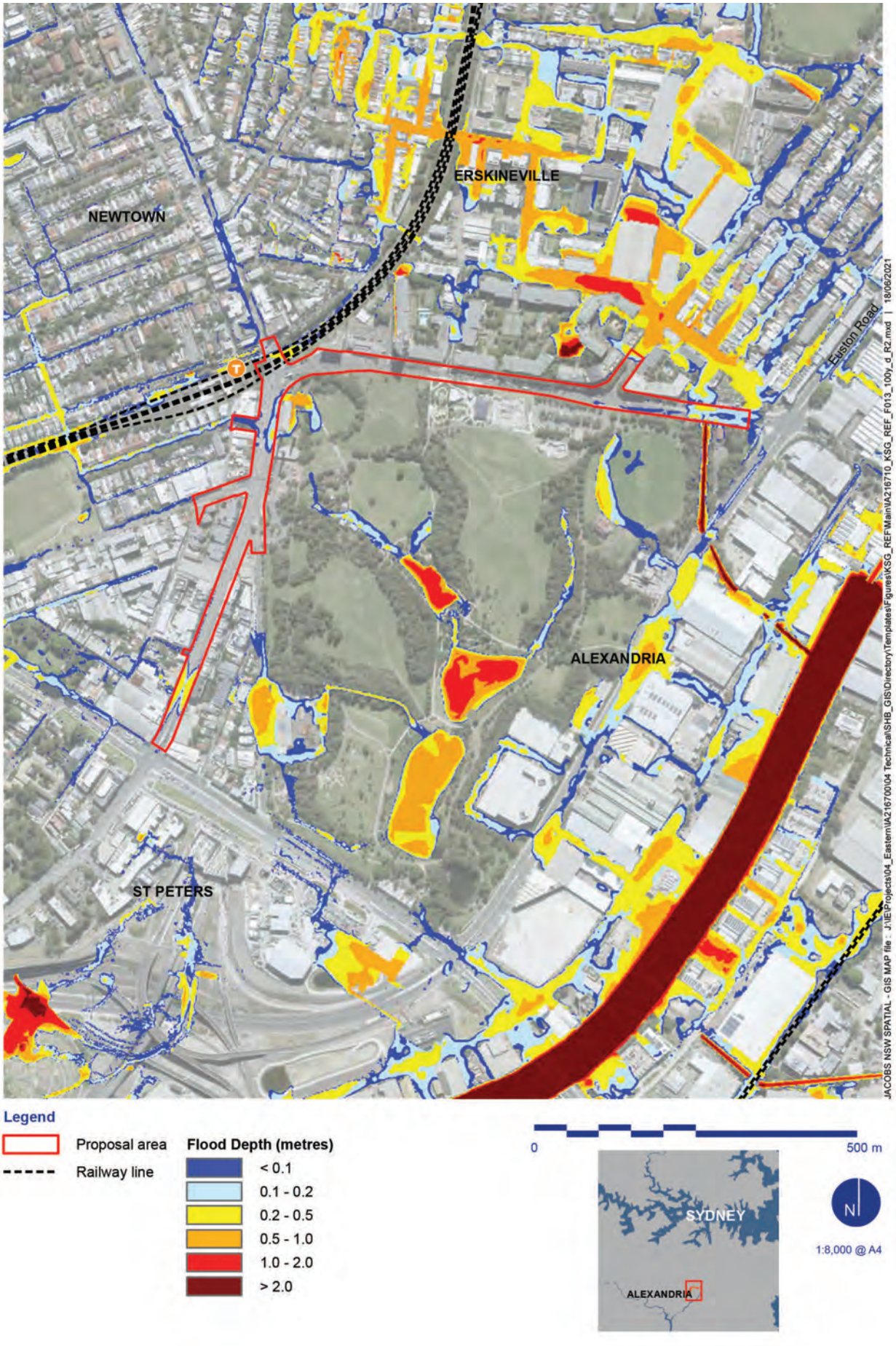

Figure 6-18 Existing flood depths for the one per cent AEP flood event

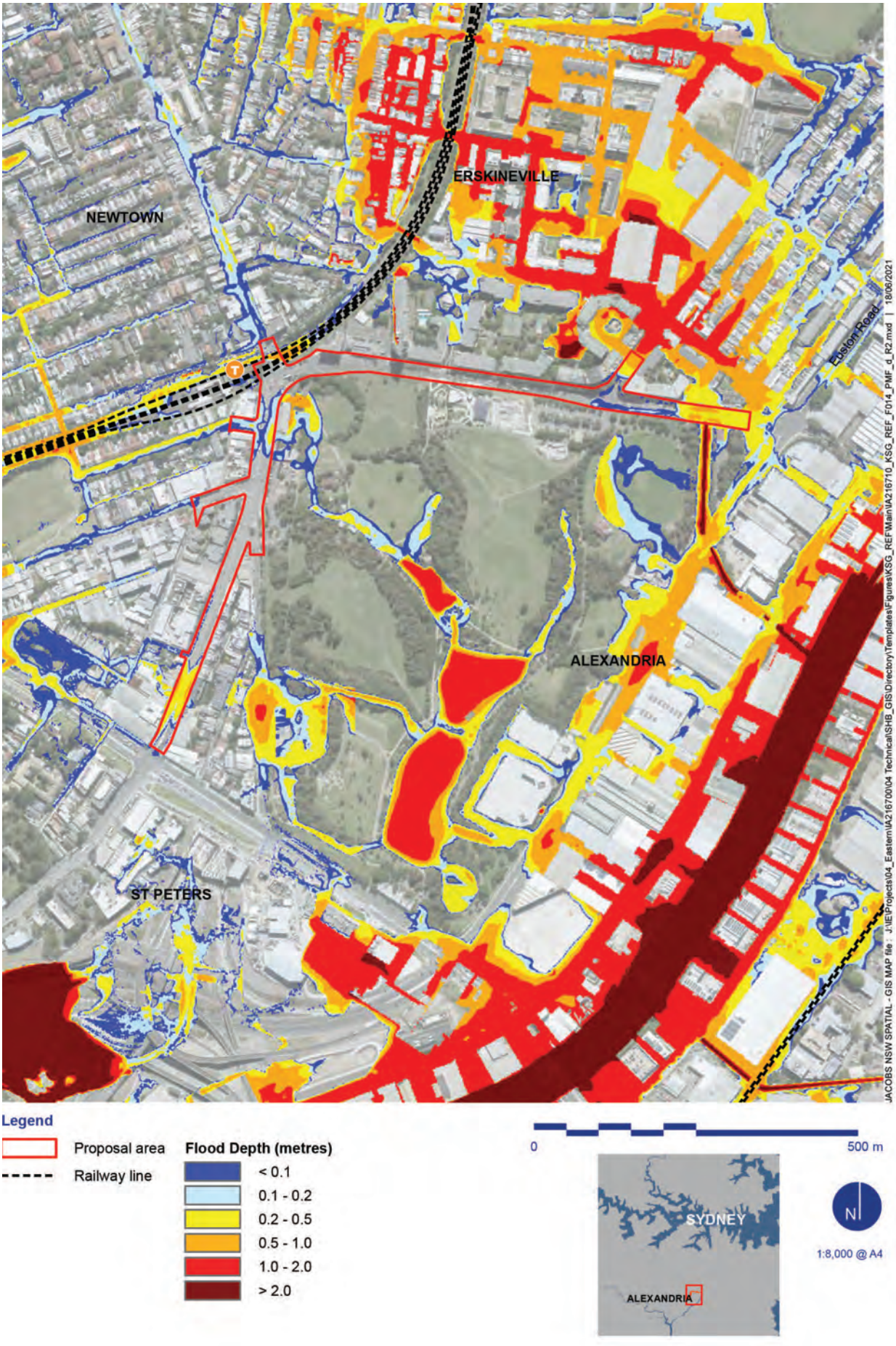

Figure 6-19 Existing flood depths for the Probable Maximum Flood event

Groundwater

The Lotsearch (April 2020) report search of the NSW DPI Office of Water registered groundwater bore database and the Bureau of Meteorology National Groundwater Information System, obtained during the Stage 1 Contamination Assessment, indicates that there are 41 registered groundwater bores within 500 metres of the proposal area (refer to Section 6.5.2). A summary of key information for the groundwater bores are provided in Appendix G (Table 4-4). Ten of the boreholes recorded groundwater at depths between one and 14.9 metres below ground level (mbgl). No registered groundwater bores are located within the proposal area.

While the depth to groundwater or direction of groundwater flow could not be definitively assessed based on available information, the surrounding topography suggests that groundwater flow is generally to the south east toward the Alexandra Canal. In the Eastern Channel East catchment at the western end of the proposal, groundwater flow is generally to the south west toward the Eastern Channel. .From the groundwater bore data, groundwater could potentially be encountered at depths of greater than two to three metres below the ground surface.

6.6.3 Potential impacts

Construction

Surface water and flooding

The duration of the construction period is expected to be 24 months. Construction phase impacts on flooding may occur due to temporary stockpiles in construction compounds obstructing and redirecting flood flows.

Two compound sites are identified at 12-18 Burrows Road, St Peters, and Venice Street, Mascot. Both sites are adjacent to Alexandra Canal. The existing compound sites are affected by 1% AEP flood (i.e. 1 in 100) from Alexandra Canal, which is larger and rarer than the 1 in 20 event. The sites could be affected by shallow overland flows and drainage runoff in the roads surrounding the sites, less than 100mm deep in up to the 1% AEP event.

Mitigation measures include provision of appropriate site drainage arrangements to manage potential effects from overland flow by conveying overland flows around the sites. Further, to ensure the compounds remain above the 5% (i.e. 1 in 20) AEP canal flood level (2.2m AHD), compound sites should be graded (or facilities erected) to a minimum ground level of 2.7m AHD, which includes an appropriate freeboard (0.5m). Construction of the proposal itself including roadworks and drainage works is not expected to have worse influence on flooding conditions than expected in the operational phase, during which impacts of the proposal on existing flooding conditions are considered negligible.

Groundwater

Construction can have an impact on groundwater systems where excavations or structures intersect these systems or dewatering is carried out or caused. Construction can also impact groundwater quality where contamination from construction activities enters the subsurface and reaches the groundwater.

The proposal involves activities that may intersect the groundwater table, including trenching and piling for utility relocations and planting of trees. However, should groundwater be encountered during excavations and dewatering be required during construction, water would be tested and managed appropriately. Management measures, such as disposal of water to an appropriately licensed facility, would be specified in the CEMP. If impacts to groundwater do occur this would be expected to be temporary and limited to a localised area for the duration of construction. As discussed in Section 4.2.7, the proposal is not expected to reduce the groundwater resource pool by three megalitres per year, and therefore an aquifer interference licence is not required.

Operation

Key aspects of the proposed design which have the potential to affect flooding conditions include:

- Changes to road profiles due to the reduction in carriageway width, modifications to road intersections and other traffic arrangements and widening of footpaths
- Modifications to road drainage infrastructure.

Potential flood impacts due to road profile changes

The road profiles in Sydney Park Road and King Street/Princes Highway are expected to be modified due to proposed changes to alignments of kerbs, gutters, central medians and road and footpath finished levels (typically less than 0.1 metres). The road profile modifications are expected to result in negligible changes in flood levels and depths in the roadways, considering the minor nature of the changes and the magnitude of overland flows in general. Flood impacts to properties adjoining the proposal area are also expected to be negligible.

In large flood events such as the one per cent AEP flood and PMF, overland flows travel from the sag point at the Coulson Street and Mitchell Road intersection over Sydney Park Road into Sydney Park and the Munni Street stormwater channel. Modified road profiles, such as the raising of road surfaces and medians, have the potential to increase the overflow level (the highest point in the road) and thereby raise upstream flood levels. At the sag point in Sydney Park Road (near the Munni Street stormwater channel), the overflow level would be raised by 25 millimetres from 7.807 metres AHD to 7.832 metres AHD. This is considered a minor increase in overflow levels and hence the flooding impact is expected to be negligible. In addition, the recent residential development adjacent to the sag point impedes flows across this sag point and reduces the potential flood impact borne by the proposal.

Potential increased flows in flood-prone areas

The runoff and overland flows conveyed from the proposal area to areas prone to flooding (including Goodsell Street) are via road gutter flow paths and the existing drainage system. The new drainage proposed as a part of the proposal are localised upgrades with small pipes (typically 375 millimetre diameter) to improve road drainage and would be connected to the existing, constrained drainage system. The design maintains existing flow patterns and would not result in redirection of flows to other locations. The modified road profiles would not increase the catchment areas draining to the sag points and areas prone to flooding, nor would the modified road profiles direct additional flows to these locations. Therefore, the proposal is not expected to result in an increase in flood depths or levels.

The existing proposal area is almost entirely paved, and the modified road profile would not result in previously pervious areas becoming paved. The proposal is therefore not expected to result in an increase in runoff potential.

Groundwater

Once the proposal becomes operational, there would be a negligible change in impervious surfaces and therefore no impacts on groundwater levels, flows, recharge, quality or other values are expected.

Cumulative impacts

An assessment of the cumulative impacts to flooding from the combination of the proposal and other developments was undertaken. The catchments in which the proposal is situated are fully urbanised. Any new or proposed developments, including the Ashmore Precinct urban redevelopment in Erskineville, would not increase the catchment imperviousness from the existing fully developed condition. Increased levels of development in the study area are therefore not expected to worsen the negligible flooding impacts resulting from the proposal.

The proposed Erskineville Flood Safe project is expected to result in improvements to flooding in the Munni Street-Erskineville sub-catchment, including the sag point at the intersection of Coulson Street and Mitchell Road. The minor nature of drainage changes from the proposal are not expected to affect the flooding improvements from the Erskineville Flood Safe project.

The WestConnex Stage 2 project and associated surface road upgrade projects, including the upgrade of Euston Road and Campbell Road/Campbell Street, are located downstream of the proposal area. Given the minor nature of drainage changes and individual flooding impacts from the proposal, the proposal is not expected to materially contribute to any cumulative impacts in combination with WestConnex Stage 2.

Climate change

Interim climate change factors from ARR 2019 indicate that storm rainfall intensities are projected to increase by approximately 20 per cent by the year 2090. The generally shallow flooding in and around the proposal area is expected to increase by a minor increment in depth only. Flood depths in significant flood problem areas in the vicinity of the proposal area, may increase by a similar proportion to the rainfall intensity increase, that is, by about 20 per cent or by up to 0.2 metres in the one per cent AEP flood. Given the proposed minor changes in road profiles and drainage arrangements, it is not expected that the negligible flooding impacts resulting from the proposal would be significantly worsened by future climate change.

Sea levels are projected to rise by 0.9 metres by the year 2100, based on research by the Intergovernmental Panel on Climate Change and as refined for the Australian region. The proposal area has a minimum elevation of eight metres AHD. Flooding in the immediate vicinity of the site is expected to be insensitive to the effects of sea level rise. Sensitivity testing for the Alexandra Canal for the one per cent AEP flood indicates that flood levels would increase within the Alexandra Canal by over 0.3 metres in response to future sea level rise. These sea level rise impacts would not affect the proposal area or worsen the negligible flooding impacts resulting from the proposal.

6.6.4 Safeguards and management measures

Managements of flood impacts from the proposal

Based on the assessment of the potential impacts to flooding during construction and operation, it is expected that the proposal would have negligible impacts on flooding. No safeguards and management measures are proposed to manage the impacts on existing flooding for the proposal area. Should further design development result in more substantial changes to road and drainage design, it is recommended that the potential for flooding impacts be reassessed and confirmed.

Safeguards and management measures in relation to groundwater contamination are outlined in Section 6.5.4.

Safeguards and management measures to manage the impacts on existing flooding for the ancillary facility sites and additional groundwater management safeguards are outlined below.

Impact	Environmental safeguards	Responsibility	Timing	Reference
Groundwater	Establish dewatering requirements and formulate groundwater protection measures (e.g. protect water quality, minimise aquifer extraction volumes, determine if a licence is required under the *Water Management Act 2000*) prior to construction. Obtain any dewatering or aquifer interference permits required if the construction groundwater dewatering volume exceeds three megalitres per year.	Contractor	Pre-construction	Additional safeguard GW1

Impact	Environmental safeguards	Responsibility	Timing	Reference
Groundwater	Prepare a Groundwater Management Plan, which would include information on but not limited to the following: – the groundwater levels – excavation dimensions – the treatment of potentially contaminated groundwater, as well as a Dewatering Sub-plan. The Dewatering Sub-plan would quantify the amount of dewatering required and the method of disposal of dewatered groundwater.	Contractor	Pre-construction	Additional safeguard GW2
Flooding	Ancillary facility sites should: – Include provision of appropriate site drainage requirements to convey overland flows around the sites – Be graded (or facilities erected) to a minimum ground level of 2.7m AHD, which includes an appropriate freeboard (0.5m).	Contractor	Construction	Additional safeguard GW3

6.7 Biodiversity

This section provides an assessment of potential impact to terrestrial and aquatic biodiversity from construction and operation of the proposal and recommends environmental management measures to reduce these impacts.

6.7.1 Methodology

The methodology for the biodiversity assessment involved:

- A desktop review of existing relevant information and database records, including the Bionet Atlas of NSW Wildlife and EPBC Protected Matters Search tool, to identify Commonwealth and State listed threatened species, populations and ecological communities within 10 kilometres of the proposal
- A site investigation carried out on 1 May 2020 to identify the terrestrial vegetation to be removed and/or impacted by the proposal and their likely provenance (planted, naturally dispersed or remnant). The site investigation did not include targeted searches for threatened flora or fauna species
- Assessment of vegetation condition and habitat value as well as threatened species to identify the likely occurrence of State and nationally listed threatened species based on their habitat requirements (provided in Appendix I)

- Assessment of significance for threatened species that are considered to have a moderate or high likelihood of occurring in the investigation area (provided in Appendix I). The assessment of significance was undertaken in accordance with the *Threatened Species Test of Significance Guidelines* (Office of Environment and Heritage, 2018) and the *EPBC Act Policy Statement 1.1 Significant Impact Guidelines* (Department of Environment, 2013)
- Identification of impacts and associated safeguards and management measures to reduce and manage impacts.

For the purposes of the biodiversity assessment the 'study area' included the area within a 20 metre radius surrounding the proposal area and the 'locality' included the area within a 10 kilometre radius surrounding the proposal area.

6.7.2 Existing environment

The proposal is located in a highly urbanised and industrialised locality that has been comprehensively cleared of native vegetation and replaced with exotic and planted vegetation. Sydney Park adjacent to the proposal was developed in the 1980s over a former brickwork and landfill site and has been extensively replanted with a variety of native trees and shrubs.

The study area consists of an existing road corridor which has been subjected to extensive disturbance and clearing as a result of the construction of the roadways and surrounding land use. Sealed road surfaces occupy the majority of the study area.

A search of the NSW Bionet Atlas was undertaken on 27 April 2020 for endangered and critically endangered species listed under the BC Act, with the potential to be located within the locality. The search identified 59 threatened species that have been previously recorded in the locality, including 33 bird species, three reptile species, two amphibian species, eight mammal species (of which four are bat species) and 14 threatened flora species.

A search of the Australian Department of the Environment and Energy's Protected Matters Online Search Tool, for matters of national environmental significance listed under the EPBC Act, was undertaken on 22 May 2020. The search identified 10 listed threatened ecological communities, 85 listed threatened species and 80 listed migratory species with the potential to be located in the locality. Many of these species favour habitats that are not represented in the locality or are only known to exist in populations restricted to specific geologies, vegetation types and localities.

Plant communities

The vegetation of the study area is characterised by street trees, landscape plantings, street trees and mowed grass. In amongst the plantings, opportunistic vegetation (such as weeds) have established in the disturbed areas.

There are no native vegetation communities or plant community types (PCTs) as identified in the NSW Native Vegetation Information System 5.1 present in the study area. There are no threatened ecological communities listed under the BC Act or EPBC Act present in the study area.

Trees identified in the study area range from mature paperbark trees and figs to exotic trees such as London Plane trees.

There are no groundwater dependent ecosystems in the study area as indicated from the review of the Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems.

Fauna habitat and condition and wildlife connectivity corridors

Natural fauna habitats in the locality have been largely removed and/or heavily modified by road infrastructure and residential and industrial development. The habitat that is present in the study area is limited to planted roadside and parkland vegetation. The habitats within the study area generally lack important features for shelter such as hollow bearing trees (although some larger fig trees have hollows),

dense litter layer, or woody debris. The vegetation structure consists only of canopy trees in most areas and the ground layer is generally absent or consists of mown lawn grass, weeds and groundcover species.

The vegetation in the study area comprises mainly scattered planted exotic and native trees which provides habitat for a variety of native arboreal mammal and bird species commonly found in urban environments, such as Brush-tail Possums, Ring-tail Possums, Kookaburras and Cockatoos. The vegetation is considered to provide limited foraging and roosting habitat for threatened birds, microbats and Grey-headed Flying-foxes.

Mature paperbark, ironbark, scribbly gum and fig trees that are planted alongside the road and within Sydney Park may provide foraging habitat (flowering and fruiting) for threatened fauna such as the Grey-headed Flying-fox (*Pteropus poliocephalus*) and Little Lorikeet (*Glossopsitta pusilla*). Trees with small to medium sized hollows may provide habitat for common mammals.

There are no mapped areas of connectivity or corridors in the study area. Planted vegetation may be used by local resident species passing through, however it does not form an important habitat corridor.

Threatened flora

Flora in the study area is dominated by planted street trees which include species such as small-leaved fig (*Ficus obliqua*), broad-leaved paperbark (*Melaleuca quinquenervia*) and London Plane tree (*Platanus* × *acerifolia*).

No threatened flora has been identified within the study area.

Threatened fauna

Based on the NSW Bionet Atlas records, 46 threatened fauna species have been identified in the locality, which includes eight mammals, 33 birds, two frogs and three reptiles. The study area does not contain suitable habitat for many of these species as there are no bushland, aquatic or rainforest habitat. No suitable habitat for threatened fish is present in the study area.

State listed threatened species with suitable habitat present within the study area include the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Superb Fruit-Dove (*Ptilinopus superbus*), Little Lorikeet (*Glossopsitta pusilla*) and the Powerful Owl (*Ninox strenua*).

The Grey-headed Flying-fox is the only nationally listed threatened species with suitable habitat present in the study area. These species are considered to have a moderate or higher likelihood of occurrence in the study area. A summary of their likelihood of occurrence is provided below and the full assessment is provided in Appendix I.

There are no Grey-headed Flying-fox roosting camps located in the study area. The nearest Grey-headed Flying-fox roosting camps are located at Turrella Reserve at Wolli Creek (4.2 kilometres away), Centennial Parklands at Lachlan Swamp (4.5 kilometres away) and Sydney Royal Botanic Gardens (5.4 kilometres away). Flying-foxes from these camps are likely to forage in the study area and this species therefore has a moderate likelihood of occurrence in the study area. Potential habitat for the Grey-headed Flying-fox within the study area is limited to foraging habitat, such as broad-leaved paperbark and small-leaved fig trees.

The Large Bent-winged Bat has been recorded in Sydney Park and has a moderate likelihood of occurrence in the study area. The nearest known roost site exists at Astrolabe Park (3.8 kilometres away from the proposal) where the decommissioned twin stormwater culverts enter the lake system in Eastlakes Golf Course. This species is known to use storm water tunnels, buildings and other man-made structures for roosting. The rail overbridge along King Street and the stormwater canal crossing underneath Sydney Park Road may provide roosting habitat, however there is low potential for these areas to be impacted by the proposal. The majority of trees within the study area are likely to provide foraging habitat for this species.

The Little Lorikeet has been recorded in Erskineville in 2015 and has a moderate likelihood of occurrence in the study area. It is known to occupy a diversity of forest and woodland habitats, remnant woodland patches and roadside vegetation. Potential habitat within the study area is limited to foraging habitat

provided by flowering and fruiting trees such as broad-leaved paperbark and small-leaved fig trees. This habitat is considered to be poor-quality habitat and only represents a small percentage of the total extent of foraging vegetation for this species within the locality.

The Superb Fruit-Dove was recorded along St Peters Street to the west of the study area and has a moderate likelihood of occurrence in the study area. It typically inhabits rainforest and eucalypt or acacia woodland where there are fruit-bearing trees. The study area is considered unlikely to form suitable breeding habitat for these species and habitat use would be likely restricted to foraging habitat such as fruit-bearing small-leaved figs. Similar to the Little Lorikeet, these birds are likely to pass through the study area during movements between larger foraging habitats, and may utilise trees in the study area for foraging intermittently when no other suitable resources are available.

The Powerful Owl is known to utilise highly modified and partially-cleared habitats as it hunts for smaller animals (such as Possums and Grey-headed Flying-foxes). It has been recorded within St Peters and Alexandria and has a high likelihood of occurrence in the study area. The study area is considered unlikely to offer suitable breeding habitat for the owl and habitat use would be likely restricted to foraging. The planted street trees in the study area are however not considered to be high-quality foraging habitat for these species.

6.7.3 Potential impacts

Construction

Direct impacts on vegetation

No native vegetation communities or PCTs would be removed by the proposal. There are no naturally occurring PCTs within the proposal area. Impacts to vegetation are limited to planted trees and landscaping including maintained lawn and exotic groundcover.

The proposal would require the removal of the following three planted native mature trees:

- Three Small-leaved fig trees (*Ficus obliqua*) at the Princes Highway / Barwon Park Road intersection, shown in Photo 6-13. The location of these trees is shown in Figure 6-20.

These native trees are considered to provide potential foraging habitat for threatened species. The proposal would also involve the relocation of seven immature planted trees located within the pavement of Princes Highway. Further discussion on the proposal's impact on foraging resources is provided below.

Photo 6-13 Small-leaved fig trees (*Ficus obliqua*) at the intersection of Barwon Park Road and Princes Highway

Excavations for road resurfacing and utility installations near remaining native trees alongside the road have the potential to affect the tree roots and therefore potentially their overall health. Consultation with an arborist would have to be undertaken to confirm the depth and extent of existing tree root systems in the vicinity of the works and to advise if the proposed works would cause any harm to the tree roots, and if tree removal is required (due to substantial impacts to tree roots) . Protection of the trees nominated for retention would be undertaken in line with Australian Standard *AS 4970-2009 Protection of Trees on Development Sites* (Standards Australia, 2010).

Removal of habitat for threatened fauna species

The proposal would remove three mature planted native trees, consisting of three small-leaved fig trees that may provide foraging habitat for the Grey-headed Flying-fox, Little Lorikeet, Superb Fruit-Dove and Powerful Owl.

A summary of the impacts on threatened fauna and fauna habitat is provided in Table 6-37 below. Given the highly mobile nature of these species, the absence of high quality habitat within the study area and their known ability to move across and utilise landscapes within the locality, neither species would likely be significantly impacted by the proposed habitat clearance.

Vegetation in the study area is not likely to be utilised as breeding habitat and the proposal would not impact any Flying-fox camps, bat roosting sites or hollow-bearing trees suitable for nesting by the Powerful Owl (none of these are located within the study area).

The proposal would replace cleared trees with a large number (over 50) of new trees and landscaping which is expected to improve the habitat value of the area significantly over the long term.

Table 6-37 Impacts on threatened fauna and fauna habitat

Species	Status[1]		Potential occurrence	Impacted by proposal	Impact
	BC Act	EPBC Act			
Powerful Owl (*Ninox strenua*)	V	–	High	Yes – foraging habitat removal	Three mature native trees providing potential foraging habitat and temporary roosting habitat
Grey-headed Flying Fox (*Pteropus poliocephalus*)	V	V	Moderate	Yes – foraging habitat removal	Three mature native trees providing potential foraging habitat
Large Bent-winged Bat (*Miniopterus orianae oceanensis*)	V	–	Moderate	Yes – foraging habitat removal	Three mature native trees providing potential foraging habitat
Superb Fruit-Dove (*Ptilinopus superbus*)	V	–	Moderate	Yes – foraging habitat removal	Three mature fruiting trees providing potential foraging habitat
Little Lorikeet (*Glossopsitta pusilla*)	V	–	Moderate	Yes – foraging habitat removal	Three mature flowering and fruiting trees providing potential foraging habitat

[1]V – Vulnerable

Injury and mortality of fauna

Fauna injury or death has the greatest potential to occur during vegetation clearing. The majority of fauna species that would be likely to occur within the proposal area are mobile species, such as birds, and may be able to move away from the path of clearing and may not be greatly affected unless they are nesting.

However, other species that are nocturnal and nest or roost in trees during the day (such as arboreal mammals and microbats), may find it difficult to move rapidly when disturbed.

Entrapment of wildlife in any trenches that are dug would be a possibility if the trenches are deep and steep sided. Wildlife may also become trapped in machinery that would be stored in the proposal area overnight, and this may result in injury or death.

Invasion and spread of weeds, pathogens and disease

During construction there would be potential for seeds and plant material from exotic species present within the proposal area to be dispersed into adjoining areas of vegetation or off site. The most likely causes of weed dispersal are associated with clearing of vegetation and stockpile of contaminated mulch and topsoil during earthworks, and movement of soil and attachment of seed (and other propagules) to construction vehicles and machinery.

While pathogens were not observed or tested for in the proposal area the potential for pathogens to occur should be treated as a risk during construction.

Safeguards and management measures for the potential introduction and spread of weeds, pathogens and disease are provided in Section 0.

Operation

Once operational there would be negligible potential for ongoing biodiversity impacts. The road corridor would be subject to ongoing maintenance by City of Sydney Council and Inner West Council, including the maintenance of groundcover through mowing and the management of weeds. There would be no additional clearing of trees required once operational and therefore no impacts to habitat for protected fauna. There is not anticipated to be any impacts to threatened species as a result of the operation of the proposal.

Conclusion on significance of impacts

The proposal would not be likely to significantly impact threatened species or ecological communities or their habitats, within the meaning of the BC Act or FM Act and therefore a Species Impact Statement or Biodiversity Development Assessment Report is not required.

The proposal is not likely to significantly impact threatened species, ecological communities or migratory species, within the meaning of the EPBC Act.

The assessments of significance found that the proposal would not be likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act or the BC Act. The significance assessments are provided in Appendix I.

Figure 6-20 Biodiversity study area, threatened species and habitat

6.7.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Protect native flora and fauna, minimise edge effects and avoid inadvertent impacts	Site-specific training will be given to personnel when working in the vicinity of areas of identified biodiversity value that are to be protected.	Contractor	Construction	Core standard safeguard B1 Section 4.8 of QA *G36 Environment Protection*
Minimise risks to native flora and fauna during construction	Consult with an arborist to confirm the depth and extent of existing tree root systems in the vicinity of the works and to advise if the proposed works would cause any harm to the tree roots.	Contractor	Detailed design/pre-construction	Additional safeguard B2
Minimise risks to native flora and fauna during construction	Protect trees nominated for retention in line with Australian Standard *AS 4970-2009 Protection of Trees on Development Sites* (Standards Australia, 2010). Exclusion zones will be established in area of construction and ancillary sites and identified in CEMP. Vehicle parking, machinery, construction compounds and material stockpiles will be located in cleared or disturbed areas.	Contractor	Construction	Additional safeguard B3
Fauna handling	Implement management arrangements consistent with the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects*, to ensure safe fauna handling. As a minimum that will include: • Fauna handling being carried out by appropriately licenced ecologists or wildlife carers • Liaison with local animal rescue agency, wildlife carer group or vet to establish agreed arrangements for fauna rescue or injured animal assistance • Induction information for construction staff.	Contractor	Construction	Additional safeguard B4

Impact	Environmental safeguards	Responsibility	Timing	Reference
Minimise weed, pest species and pathogen risks	Manage weed, pest species and pathogen in accordance with the *Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects* to manage environmental risks associated with weeds, pest species and pathogens. As a minimum that will include: • Implementation of appropriate weed control methods and weed disposal • Implementation of appropriate hygiene protocols where there are potential or known pathogen risks.	Contractor	Construction	Additional safeguard B5

Other safeguards and management measures that would address biodiversity impacts are identified in Section 6.8 (Landscape character and visual impacts).

6.7.5 Biodiversity offsets

The proposal would not result in impacts to greater than one hectare of a threatened ecological community or habitat for threatened species which cannot withstand a loss. Therefore, offsets for threatened ecological communities or species would not be necessary, and a Biodiversity Offset Strategy would not be required.

6.8 Landscape character and visual amenity

A landscape character and visual amenity assessment was completed for the proposal to outline the urban design principles used, analyse the receiving landscape and assess the effects of the proposal upon local visual amenity. The assessment is presented in the *Sydney Park Junction Visual Impact Assessment* (Jacobs, 2021e) and is provided in full in Appendix J and summarised below. A summary of the assessment is presented in this section, together with safeguards and management measures to mitigate any negative impacts.

6.8.1 Methodology

The landscape character and visual assessment was prepared in accordance with policy and guidelines outlined in:

- *Beyond the Pavement 2020* (Transport for NSW, 2020)
- *Environmental impact assessment practice note EIA-N04: Guideline for landscape character and visual impact assessment* (Roads and Maritime Services, 2018a)
- *Environmental impact assessment practice note EIA-N02: Ecologically Sustainable Development* (Roads and Maritime Services, 2014a)
- Movement and Place Framework, as outlined in the *Future Transport Strategy 2056* (Transport for NSW, 2018a)

The methodology for this report included:

- Describing the proposal site, surrounding area, proposed works and landscape character of the study area
- Consideration of the planning instruments that are relevant to both visual amenity and landscape character impact and apply to the subject site and the surrounding area
- Assessment of the impact of the proposed development on landscape character and the visual impact of the proposed development from publicly accessible locations
- The identification of measures to mitigate the negative impacts of the proposal.

Visual impact assessment

Visual impact assessment is carried out to understand the day-to-day visual effects of a proposal on views. It is based on the assessment of a number of selected key viewpoints that are rated according to the sensitivity of the view and the magnitude of the proposal within that view. The locations and directions of the chosen viewpoints are representative of the range of viewpoints both within and beyond the road corridor.

Five viewpoints (VP) were identified along the length of the proposal. These are shown in Figure 6-21. As the proposal lies in an inner-city area with no long distance views of the proposal area, all the VPs are located within the proposal area looking across and along the corridor.

When considering the predicted effect of changes upon views/ visual receptors, the sensitivity of the view to change is combined with the magnitude of the change to give an overall judgement of significance of impact supported by analysis of evidence and professional judgement. According to Transport for NSW guidelines (2018a), sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed nature of change. Magnitude refers to the physical scale of the proposal, how distant it is and the contrast it presents to the existing condition.

The combination of sensitivity and magnitude was used to derive the visual impact rating (as shown in Table 6-38) and provide an overall visual impact assessment.

Table 6-38 Landscape character and visual impact matrix (Roads and Maritime, 2013)

Sensitivity	Magnitude						
		High	**High to Moderate**	**Moderate**	**Moderate to Low**	**Low**	**Negligible**
	High	High	High	Moderate/High	Moderate/High	Moderate	Negligible
	Moderate	Moderate to High	Moderate/High	Moderate	Moderate	Moderate/Low	Negligible
	Low	Moderate	Moderate	Moderate/Low	Moderate/Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

6.8.2 Existing environment

The proposal area is surrounded by a modified urban environment which includes a mix of residential, commercial/business, recreational, industrial and transport related land uses. The main elements of the local context in which the proposal area is situated is shown in Figure 2-1.

The study area has a gentle undulating topography, as described in Section 6.10.1. Sydney Park features the most topographical variation locally with manmade landform that offers scenic views of the city skyline and inner west, and a series of wetland ponds that function as a recycled water network system.

Notable landscape elements within the locality include:

- Sydney Park: Sydney Park covers an expansive 41.6 hectares and is the inner-city's third largest park. It includes undulating landform that provides long views across the city. The park was formerly a landfill site and now features numerous recreational facilities, stormwater retention ponds that function as wildlife habitats and a former brickworks listed on the City of Sydney's heritage list. The

WestConnex Stage 2 project has reorganised regional and local road traffic along the southern and eastern side of Sydney Park, providing the catalyst for this proposal to make streetscape improvements north and west of the park.

- Newtown: King Street is the main thoroughfare through the lively and unique suburb of Newtown. The diverse retail offering of Newtown changes in character south of St Peters Station and due to recent changes has seen an increase in residential developments with ground floor retail which is raising the quality of built form and enhancing the streetscape.
- Road and Rail infrastructure: The rail line is largely concealed from view from the site and runs broadly northeast to southwest in deep cutting to the northwest corner of Sydney Park. St Peters Station lies in the cutting adjacent to the Sydney Park Road and King Street intersection. The station serves the Bankstown Line, Airport & South Line, and Inner West& Leppington Line.
- Princes Highway: Princes Highway extends from May Street southwards and forms a major route connecting Sydney to Adelaide. It is a busy arterial road, overlooked by residential apartments and businesses, with three lanes in each direction and extends northwards along the length of Newtown to meet the Great Western Highway.
- Sydney Park Road: Sydney Park Road is a busy arterial road aligned along the northern boundary of Sydney Park. The road typically comprises two lanes of traffic in each direction overlooked by large residential blocks on the northern side. The streetscape is lined by trees along much of its length with attractive views into Sydney Park.

The quality of the streetscape varies along the length of the proposal. Sydney Park Road has the most consistent vegetative cover, typically featuring regularly spaced mature paperbark trees along both sides. Open views into Sydney Park are also available along the length of the road and feature mature trees and undulating grassed landform.

Princes Highway has comparatively less street tree planting. Several paperbark trees are aligned within a narrow grass verge adjacent to the brickworks and a distinctive grove of peppercorn trees are located adjacent to the King Street and Sydney Park Road intersection in the St Peters Plaza. Several trees of varying quality are within the pavement adjacent to the Barwon Park Road intersection. The Sydney Park car park has a landscaped buffer fronting King Street/Princes Highway that enhances the streetscape and filters views into the car park.

Several recent developments have planted young trees within the pavement along the southern section of Princes Highway however the narrow width of the pavements and projecting canopies pose maintenance issues with the siting of the trees.

As described in Section 6.3 (Non-Aboriginal heritage), there are a number of non-Aboriginal heritage items and sites in and around the proposal area.

Figure 6-21 Viewpoint locations

6.8.3 Potential impacts

Construction

During construction, there would be temporary impacts on visual amenity from the construction compounds, clearing of vegetation, generation of wastes and construction activities.

Night work is would be required for the proposal which would involve temporary lighting at compounds/ancillary facilities and work sites for operational, safety and security purposes. Lighting installations would be designed and located to avoid light spill into residential areas and any other identified sensitive receivers. Construction staging would result in light spill impacts being limited to smaller sections of the proposal area at a given time.

Three mature planted trees are to be removed as part of the proposal which would temporarily impact the landscape character of the proposal area. However, the proposal includes a large number of new trees (over 50) and landscaping which would improve the landscape character of the proposal area significantly over the long term.

Safeguards and management measures to ameliorate visual impacts are summarised below.

Operation

The potential visual impacts of the proposal during operation are summarised in Table 6-39.

Table 6-39 Visual impact assessment

Impact			Comment and photos
Sensitivity	Magnitude	Overall impact	
Viewpoint 1: Barwon Park Road and Princes Highway intersection			
Low	Moderate	Moderate/Low	This viewpoint is located on the pavement alongside the intersection of Princes Highway and Barwon Park Road. The existing view comprises residential apartments along both roads, several street trees of varying condition, the wide carriageway of Princes Highway and associated highway infrastructure including signage and the overhead VMS. The road lane in the foreground would be removed and replaced by a two-way intersection created outside the BP garage. The foreground would become a widened area of pavement, tree and shrub planting. A new shared crossing would span Princes Highway within the foreground. The VMS would be relocated further north. The western pavement of Princes Highway would be widened into the carriageway and street trees planted. Highway signage would be adjusted/ replaced. Light poles and telegraph poles would remain in-situ. 

Impact			Comment and photos
Sensitivity	Magnitude	Overall impact	
Viewpoint 2: King Street / Sydney Park Road intersection			
Low	Moderate	Moderate/Low	This viewpoint is located on the pavement adjacent to the walkway to St Peters Station from the King Street / Sydney Park Road intersection. The existing view looks across the large expanse of highway, associated infrastructure and moving traffic to residential flats and Sydney Park in the background. Limited street tree planting, block paving, the heritage buildings of the former brickworks and vegetation within Sydney Park provide visual interest. The lane in the foreground would be removed and the pavement widened with additional pavement and planting. The pavements on either side of Sydney Park Road to the rear of the view would also be widened with additional hard surfacing and planting. The Sydney Park Road central median would also be removed. The increase in pavement widths and addition of kerbside tree and shrub planting would reduce the large-scale of the intersection and provide greater physical separation from moving traffic. 

Impact			Comment and photos
Sensitivity	Magnitude	Overall impact	
Viewpoint 3: Mitchell Road and Sydney Park Road intersection			
Low	Low	Low	This viewpoint is located on the southern side of Sydney Park Road and looks east towards Euston Road. Sydney Park Road is a busy traffic thoroughfare bordered by large residential blocks to the north and Sydney Park to the south. The road is tree-lined along much of its length however the large scale of the highway and large volumes of traffic detract from and dominate the view. The northern carriageway of Sydney Park Road would be narrowed and the central reserve removed. A two-way off-road cycleway would be added parallel to the northern footpath with a planted buffer strip. The southern side of the road would be narrowed to two lanes and the dedicated right-turn lane removed. 

Impact			Comment and photos
Sensitivity	Magnitude	Overall impact	
Viewpoint 4: Princes Highway			
Low	Moderate	Moderate/Low	This viewpoint is located on the western pavement of Princes Highway, just south of Short Street. The location is outside one of several commercial properties of varying age which contrast with the modern mixed-use developments opposite. Larger scale mixed-use developments populate the majority of the eastern side of the road between Barwon Park Road and Campbell Street. Redevelopment of land to the north of Short Street fronting Princes Highway is currently underway and will add further mixed-use frontages to the streetscape. Landscape build-outs will be added in the kerbside lane and will feature trees and shrub planting. Between the build-outs will be used as dynamic community spaces at the council's discretion. The central median will be retained. A section of footpath north of Short Street will be extended into the carriageway to accommodate the relocated bus stop, planting and a new pedestrian crossing. The landscape build-outs, section of widened footpath, shrub planting and street trees will narrow the road corridor, provide physical separation from moving traffic and diversify the character of the view. 

Impact			Comment and photos
Sensitivity	Magnitude	Overall impact	
Viewpoint 5: Princes Highway			
Low	Moderate	Moderate/Low	This viewpoint is located on the eastern pavement of Princes Highway, looking north towards the Sydney Park Road interchange. The view is dominated by built form, moving traffic and the wide Princes Highway carriageway. The eastern side of the street features a grass verge with occasional tree planting. Vegetation along the periphery of Sydney Park and the historic brickwork chimney stacks are visible to the right of the view. The pavements on both sides of Princes Highway would be widened with additional paving, trees and shrub planting strips. The crossing in the foreground would be removed and a new shared crossing would be added to the south of this viewpoint and mid-block within the middle distance of the view. The median in the foreground would be removed and a new length added further north. The widened public domain, shrub planting and street trees would narrow the road corridor, diversify the character of the streetscape and filter views towards moving traffic and provide physical separation from the road corridor. 

6.8.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Existing trees	Keep tree removal to a minimum.	Contractor	Detailed design/pre-construction	Core standard safeguard L1 Section 3.3 of QA *Specification R179*
Tree planting	Proposed tree planting should reference the City of Sydney's Street Tree Masterplan and the Marrickville Street Tree Masterplan. City of Sydney's Street Tree Masterplan identifies the proposal site within the Southern Industrial precinct and proposes the planting of: • *Lophostemon confertus* (Brush Box) • *Banksia integrifolia* (Coast Banksia) • *Angophora costata* (Smooth Barked Apple) • *Corymbia maculata* (Spotted Gum) • *Platanus acerifolia* (London Plane) • *Robinia pseudocacia "Frisia"* (Golden Robinia) • *Backhousia citriodora* (Lemon Scented Myrtle) • *Fraxinus pennsylvanica* (Green Ash) • *Jacaranda mimosifolia* (Jacaranda) • *Melaleuca quinquenervia* (Broad Leaf Paperbark) • *Eucalyptus microcorys* (Tallowwood) • *Eucalyptus sideroxylon* (Red Ironbark) The Marrickville Street Tree Masterplan identifies the proposal site within the Sydenham & St Peters precinct and proposes the planting of *Lophostemon confertus* (Brush Box) along the Princes Highway between Belmore Street and Goodsell Street.	Contractor	Detailed design/pre-construction	Additional safeguard L2

6.9 Socio-economic, land use and property

6.9.1 Methodology

The socio-economic assessment was prepared in accordance with Transport for NSW's *Environmental Impact Assessment Practice Note (EIA-N05) – Socio-economic assessment* (moderate assessment) (Transport for NSW, 2020). The methodology for the preparation of the socio-economic assessment involved:

- Scoping of the potential socio-economic issues for the proposal and identification of communities and groups likely to be affected by the proposal
- Describing the existing socio-economic environment of the study area to provide a baseline from which impacts of the proposal were assessed, including review of relevant state and local government policies, population and demographic data (including consideration of the Australian Bureau of Statistics (ABS) Census of Population and Housing 2016) and social values and features in the study area
- Identifying and assessing the potential socio-economic impacts of the proposal's construction and operation on:
    - Property
    - Employment and training
    - Local business and industry, including changes to customer and staff parking
    - Social infrastructure within 500 metres of the proposal
    - Community values such as local amenity, cohesion, safety and environmental values
    - Local access and connectivity, including impacts on motorists, pedestrians, public transport users and cyclists.
- Evaluating the significance of potential negative socio-economic impacts of the proposal based on the sensitivity of the local community and magnitude of the proposed works.

Study area

The study area for the socio-economic assessment is based on those communities and groups such as residents, workers, business customers, visitors and public transport users that are likely to experience changes to socio-economic conditions from the construction and operation of the proposal. The study area comprises the ABS Statistical Areas Level 2 (SA2) locations of:

- Newtown-Camperdown-Darlington SA2
- Sydenham-Tempe-St Peters SA2
- Erskinville-Alexandria SA2.

Benefits and impacts of the proposal's construction and operation may also be experienced by communities outside of the study area. This assessment also considered at a broader level, impacts on regional communities and businesses in the City of Sydney and Inner West LGAs and wider Sydney region as relevant. Figure 6-22 shows the study area for the purpose of this socio-economic assessment.

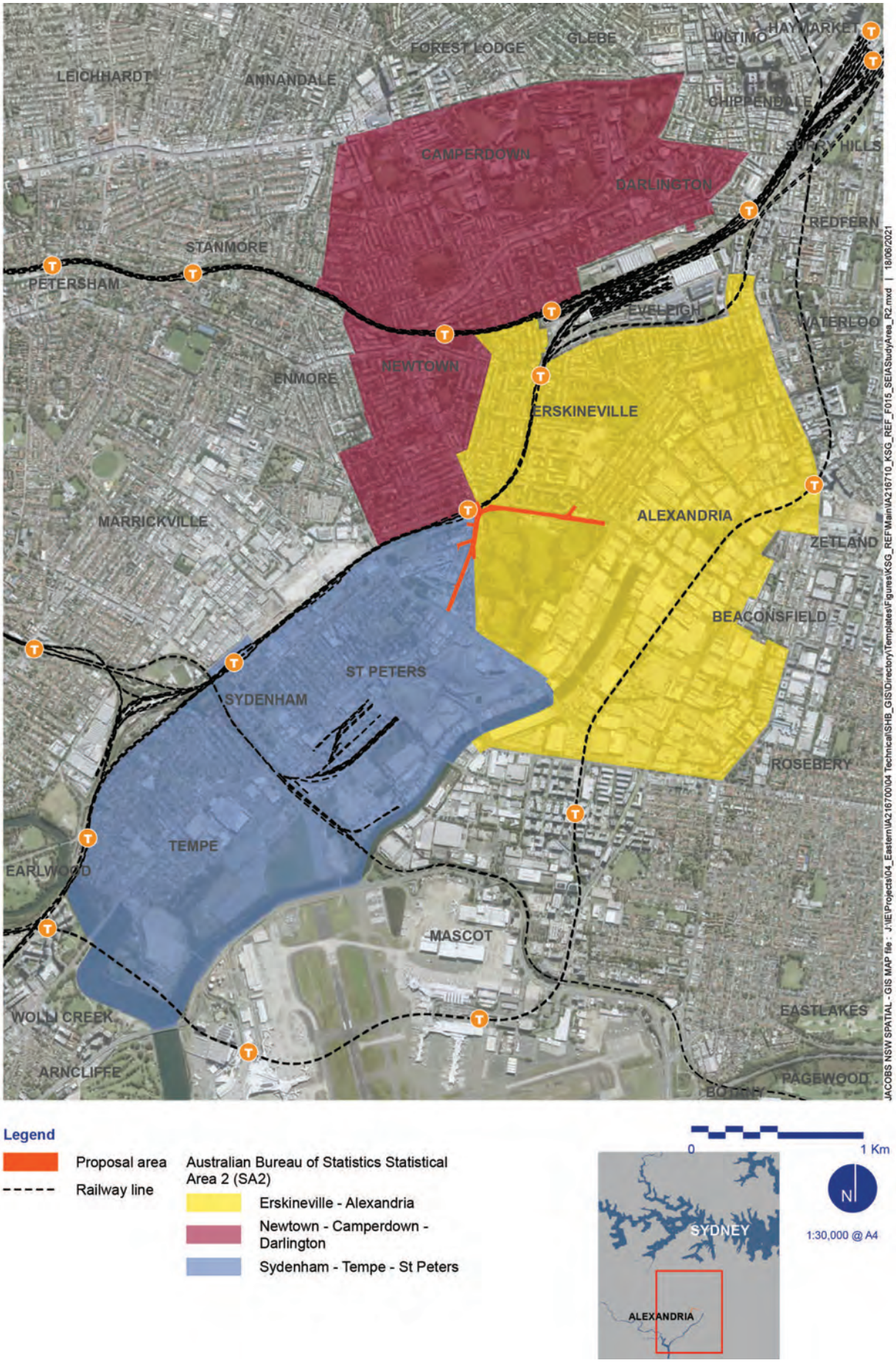

Figure 6-22 Socio-economic study area

Evaluation matrix

An evaluation matrix was used to evaluate the significance of the proposal's negative socio-economic impacts. The significance of identified impacts was determined with consideration of:

- Sensitivity of receptors (i.e. environmental characteristics, communities, businesses, business clusters, social infrastructure and residences)
- Magnitude of the proposed works.

The matrix for determining the level of significance and criteria for determining the sensitivity and magnitude of identified impacts is outlined in Table 6-40.

Table 6-40 Assessing level of significance

Sensitivity of receptor	Magnitude			
	High	Moderate	Low	Negligible
High	High	High-moderate	Moderate	Negligible
Moderate	High-moderate	Moderate	Moderate-low	Negligible
Low	Moderate	Moderate-low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Levels of sensitivity

- **Negligible** – No vulnerability and able to absorb or adapt to change.
- **Low** – Minimal areas of vulnerabilities and a high ability to absorb or adapt to change.
- **Moderate** – A number of vulnerabilities but retains some ability to absorb or adapt to change.
- **High** – Multiple vulnerabilities and/or very little capacity to absorb or adapt to change.

Levels of magnitude

- **Negligible** – No discernible positive or negative changes caused by the impact. Change from the baseline remains within the range commonly experienced by receptors.
- **Low** – A discernible change from baseline conditions. Tendency is that the impact is to a small proportion of receptors over a limited geographical area and mainly within the vicinity of the proposal. The impact may be short term, or some impacts may extend over the life of the proposal.
- **Moderate** – A clearly noticeable difference from baseline conditions. Tendency is that the impact is to a small to large proportion of receptors and may be over an area beyond the vicinity of the proposal. Duration may be short to medium term or some impacts may extend over the life of the proposal.
- **High** – A change that dominates over existing baseline conditions. The change is widespread or persists over many years or is effectively permanent.

6.9.2 Existing environment

Social profile

Population and age

The study area had an estimated residential population of 55,335 people in 2018 (ABS, 2019). Over the 10 years leading to 2018, the study area experienced relatively high population growth compared to Greater Sydney, which is largely attributed to high population growth in the Erskineville-Alexandria and Newtown-Camperdown-Darlington SA2s (ABS, 2019).

Population projection data is available at an LGA level. By 2041, the population of the Sydney LGA is expected to grow to 259,469 people, an average of 1.2 per cent annually from 2016. At the same time, the Inner West LGA is projected to grow to 287,089 people, or an average of 1.0 per cent annually from 2016. This is below the projected average growth rate for Greater Sydney (at 1.7 per cent annually) (NSW Department of Planning and Environment, 2019).

Within the study area, high population growth is expected to continue in Erskineville-Alexandria, with the delivery of urban renewal projects at Green Square. The Green Square Urban Renewal Area is expected to accommodate about 61,000 people by 2030. The Ashmore Precinct to the north of Sydney Park is also proposed to have a population of about 6000 residents by 2025.

Residents in the study area have a higher proportion of working age people, with about 82.6 per cent of residents aged 15 - 64 years at the 2016 Census, compared to 67.5 per cent in Greater Sydney. The study area has lower proportions of children aged 14 years or younger and elderly people aged 65 years or above than the Greater Sydney average.

Cultural diversity

The study area has a lower proportion of people born overseas, non-English speaking households and Aboriginal and/or Torres Strait Islander persons. At the 2016 Census, approximately 33.8 per cent of the study area's population were born overseas, while about 22.4 per cent spoke a language other than English at home. This is compared to 36.8 per cent and nearly 36 per cent respectively in Greater Sydney. About 1.3 per cent of the residents in the study area are of Aboriginal and/or Torres Strait Islander descent, which is marginally below the Greater Sydney average.

Residents in the study area generally have high levels of English proficiency, except in the Sydenham-Tempe-St Peters SA2 where levels of people who do not speak English well or at all are above the Greater Sydney average.

Households, families and housing

At the 2016 Census, the study area generally had a lower proportion of family households and higher proportions of group or lone person households compared to Greater Sydney. Over half of families in the study area did not have children, which was well above the Greater Sydney average.

In 2016, the majority of residents in the study area lived in higher density dwellings such as semi-detached houses and apartments, reflecting the study area's inner-city location.

High proportions of dwellings within the study area were rented at the 2016 Census. The Newtown-Camperdown-Darlington SA2 had very high proportions of rental houses, which is likely to reflect its proximity to the University of Sydney at Camperdown. About 64 per cent of dwellings in the Sydenham-Tempe-St Peters SA2 consisted of owner-occupied dwellings, which reflected the more established housing and older population recorded within this area.

Housing costs within the study area at the 2016 Census were generally similar to or marginally above the Greater Sydney average.

Disadvantage and vulnerability

The 2016 Census indicates that residents in the study area have a relatively low level of need of assistance. About 2.2 per cent of the population reported a need for assistance in one or more of the three core activity areas of self-care, mobility or communication because of a long-term disability, health condition or old age in 2016 compared to 4.9 per cent in Greater Sydney.

Travel behaviour

Households in the study area had relatively low levels of car ownership in 2016, with 27.6 per cent of households without access to a motor vehicle, compared to 11.1 per cent in Greater Sydney.

Travel to work by residents in the study area reflects the area's high level of public transport access and proximity to employment and activity centres such as the CBD, the University of Sydney at Camperdown and Sydney Airport. At the 2016 Census, residents in the study area were more likely to use public transport, walk or cycle for their journey to work compared to residents in Greater Sydney.

Figure 6-23 shows the main methods for travel to work for residents aged 15 years or over in the study area. This shows that residents in the study area are more likely to use public transport, walk or cycle for their journey to work compared to residents in Greater Sydney. About 46.5 per cent of residents aged 15 years or over in the study area used the bus or train for all or part of their journey to work. People who walked to work accounted for about 10.7 per cent of residents aged 15 years or over, while people who

cycled represented 4.4 per cent of residents aged 15 years or over. This is compared to 4.0 per cent and 0.7 per cent respectively in Greater Sydney.

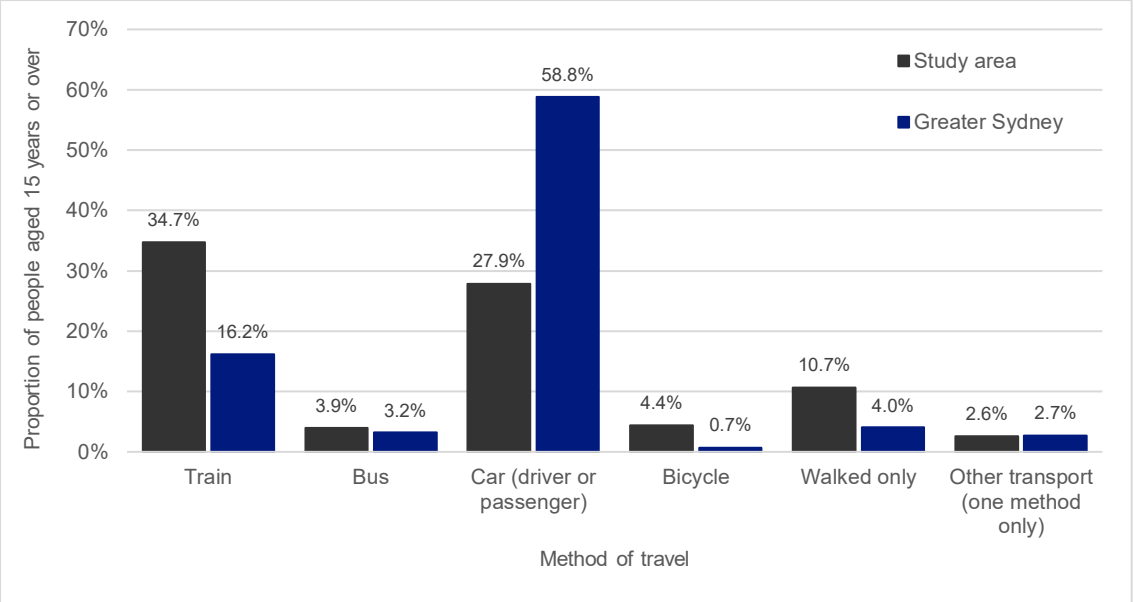

Figure 6-23 Method of travel to work for residents aged 15 years or over (ABS, 2016)

At the 2016 Census, the average commute for residents in the study area was between 7.14 kilometres and 8.81 kilometres, which was about half the average commuting distance for residents of Greater Sydney (at 15.25 kilometres). This is likely to reflect the high proportion of people who commute by walking and cycling, as well as the level of employment within the study area and its proximity to employment centres.

In 2016, almost half (46.5 per cent) of residents in the study area aged 15 years or older used a bus or train for all or part of their journey to work. People who walked to work account for about 10.7 per cent of residents (more than double the Greater Sydney average) whereas people who cycled represented 4.4 per cent (compared to 0.7 per cent in Greater Sydney).

Health

The study area is located within the Sydney Local Heath District (LHD). In 2019, the NSW Population and Health Survey found that 27.3 per cent of adults in the Sydney LHD reported to undertake insufficient physical activity. Children in the Sydney LHD were reported to have levels of adequate physical activity above the NSW average and also recorded the second highest level of adequate physical activity in the Sydney metropolitan area.

Economic profile

Income and employment

At the 2016 Census, median household and individual incomes in the study area were above the Greater Sydney average, with households in Erskineville-Alexandria SA2 displaying particularly high median incomes. Residents in the study area displayed relatively high levels of labour force participation and low levels of unemployment compared to Greater Sydney.

Workforce profile

In 2016, there were about 50,077 people working in the study area, of which about 90 per cent worked in the Newtown-Camperdown-Darlington and Erskineville-Alexandria SA2s. The largest industries of employment in the study area included health care and social assistance (15.3 per cent), education and training (15.2 per cent), retail trade (10.9 per cent), transport, postal and warehousing (8.5 per cent) and professional, scientific and technical services (8.5 per cent).

Figure 6-24 shows the main methods for travel to work for people aged 15 years or over who worked in the study area. Travel by private vehicle was the predominant mode of transport for people working in the study area, with 52.5 per cent of workers travelling by car (as either a driver or passenger) for all or part of their journey to work. This was below the average for Greater Sydney (58.3 per cent), although this was largely due to relatively low levels of private car use in the Newtown-Camperdown-Darlington SA2 (38.1 per cent).

Public transport commuters accounted for about 30.3 per cent of people working in the study area, compared to 25.5 per cent in Greater Sydney. The study area also had a high proportion who people who commuted by walking or cycling, with about 7.2 per cent of the study area's working population walking to work and 2.2 per cent cycling to work at the 2016 Census. This is compared to 4.1 per cent and 0.7 per cent respectively in Greater Sydney.

The average commute to work for workers in the study area ranged from 13.27 kilometres to 17.70 kilometres. This is compared to an average of 15.99 kilometres in Greater Sydney and is consistent with the use of private vehicle for travel to work.

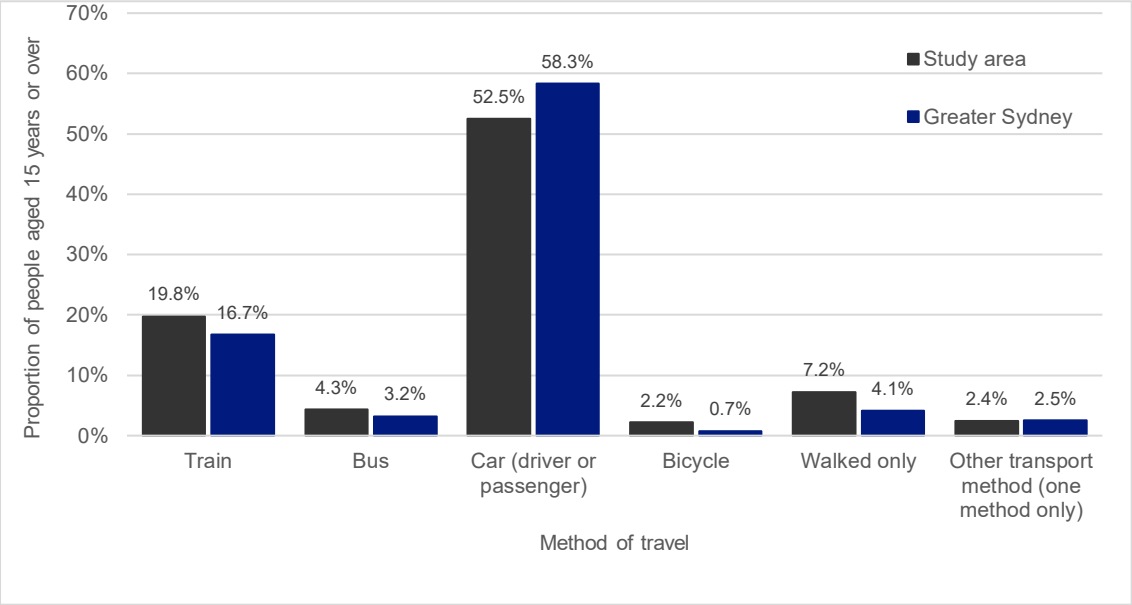

Figure 6-24 Travel to work – working population (ABS, 2016)

Local businesses

There were 6,867 businesses in the study area in 2018, of which about 57.4 per cent were 'non-employing businesses' and a further 37.8 per cent employed between one and 19 people (ABS, 2020). Nearly one in five businesses (19.0 per cent) comprise professional, scientific and technical services (for example, architectural, engineering and technical services, advertising, veterinary services, legal and accounting services, etc), with other key industries also including rental, hiring and real estate, construction related businesses, retail trade and health care and social assistance.

Businesses along the proposal at King Street, Princes Highway and Mitchell Road are shown in Figure 6-25 and include a mix of:

- Cafes, restaurant and takeaway shops
- Service-related businesses such as photographer, financial services, veterinary services, automotive repair, dog grooming, real estate and property management
- Retail businesses, including service station, motorcycle and bicycle stores, pet store, and bottle shop
- Health and medical related businesses, including physiotherapist and dentist
- Postal services, including Australia Post and cargo transport
- Art studio and gallery
- Waste management and recycling services.

Many of these businesses are likely to serve the needs of residents and workers in the study area and surrounding region, although some businesses are likely to also service customers from across Greater Sydney due to their more specialised nature. The reliance of businesses on 'passing trade' is likely to be influenced by the nature of the business, with those businesses that are likely to have a higher reliance on passing trade include the service station, cafes, restaurants and takeaway stores, and bottle shop.

Social infrastructure

The study area accommodates a wide range of community services and facilities to meet the needs of both local and regional communities. These include education facilities; health, medical and emergency services; sport, recreation and leisure facilities; and community and cultural facilities. Social infrastructure located near to the proposal mainly includes open space, recreation and leisure uses, education facilities; and cultural uses, as shown in Figure 6-26.

Sydney Park consists of around 40 hectares of open space, including wetlands, memorial gardens, and formal and informal recreation facilities. A number of recreational and leisure facilities are supported by the parklands including Sydney Park Wetlands, sporting facilities, skate park, playgrounds and dedicated dog park areas. Cycle tracks and walking paths also run throughout the park. King Street and Sydney Park Road form the western and northern boundary of Sydney Park. Existing traffic on these roads creates a perceived barrier to movement between Sydney Park and surrounding residential and commercial areas for some pedestrians and cyclists.

A range of other local and district level open space and recreation areas are located near the proposal that cater for the needs of communities in the study area and surrounding region. These include Camdenville Park, May Street Reserve, Pearl Street Reserve, and Darley Street Playground.

There are a number of education facilities near the proposal. St Peters Public School Is located south of the proposal area and caters for students from Kindergarten to Year 6. Camdenville Public School is located west of the proposal and also provides education for primary school students from Kindergarten to Year 6. A private primary school, St Pius X Catholic Primary school is located nearby at Edgeware Road.

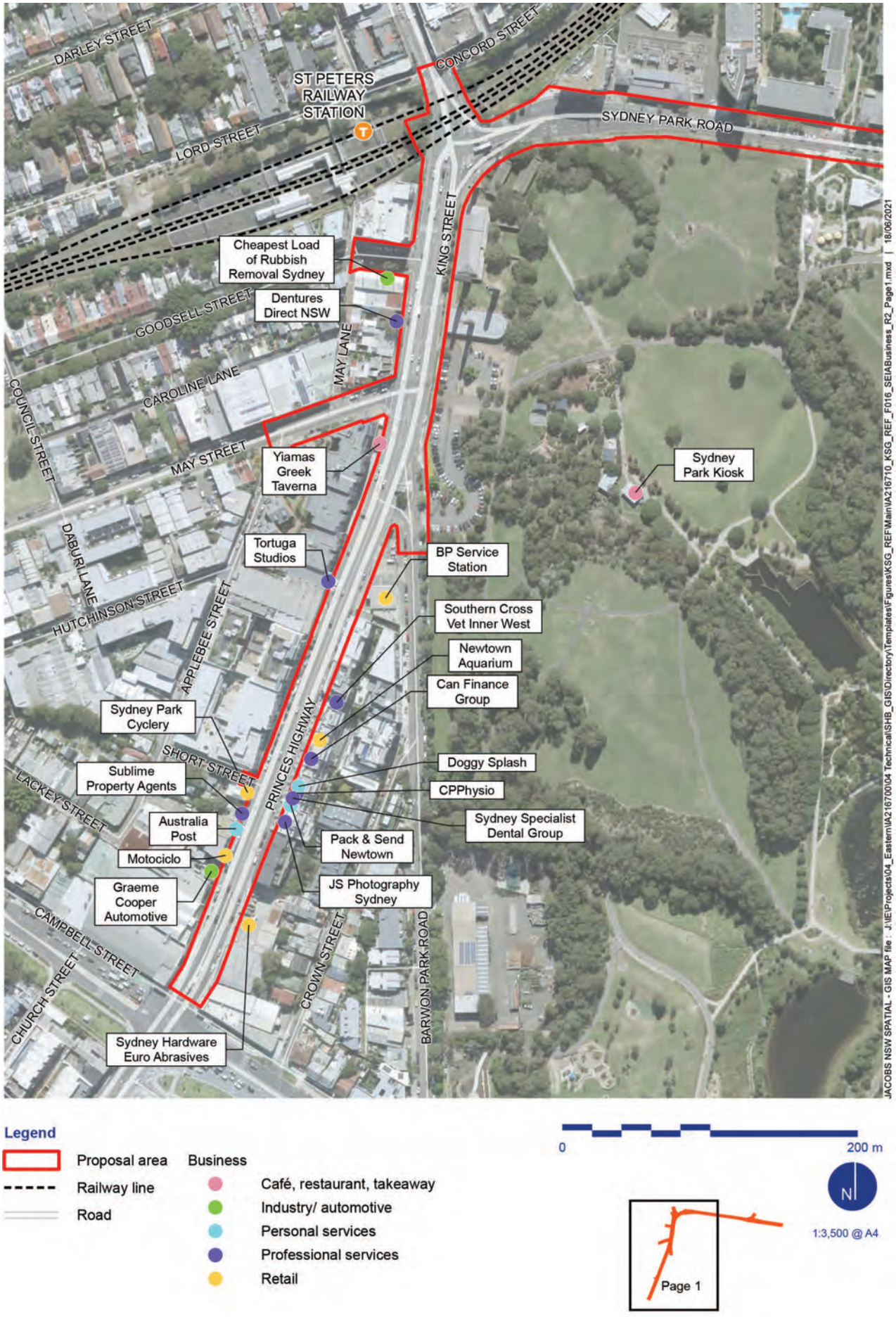

Figure 6-25 Local businesses

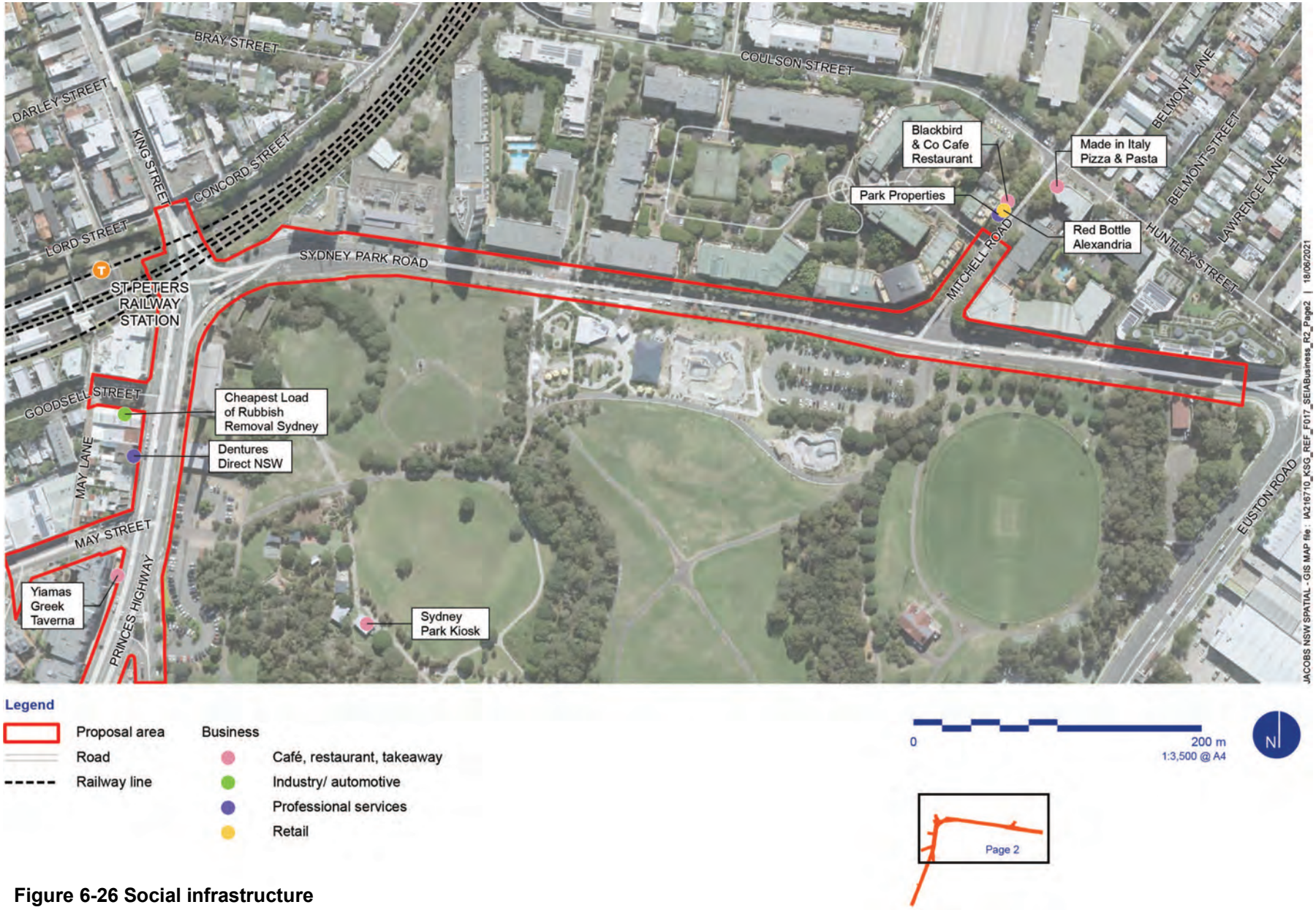

Figure 6-26 Social infrastructure

Figure 6-26b Social infrastructure

Transport and access

The study area is well serviced by transport services and facilities that provide a high level of access and connectivity to destination within the study area, surrounding suburbs and wider Sydney area. Key transport corridors and facilities in the study area include:

- Major road corridors such as King Street, Princes Highway and Sydney Park Road, which provide access for motorists, public transport services between the CBD and key centres, and active transport functions
- Active transport facilities, including footpaths and pedestrian crossings along the major road corridors, off-road shared paths along Sydney Park Road and through Sydney Park
- Public transport facilities, including St Peters train station, which provides passengers access to the Sydney CBD and Liverpool / Lidcombe via T3 Bankstown Line services, and bus routes and bus stops at Princess Highway, Sydney Park Road and King Street.

On-street car parking is currently provided along the Princes Highway, King Street and Sydney Park Road. There are about 77 car park spaces along Princes Highway and King Street, and about 38 car park spaces along Sydney Park Road. Along the Princes Highway and King Street, parking is generally unrestricted outside of the morning weekday peak period clearway restrictions on the western side of the Princes Highway, and outside of the evening weekday peak period clearway restrictions on the eastern side of the Princes Highway. On the western side of King Street parking restrictions are generally in place during the weekday morning peak period and for two hours in the afternoon.

Further detail about existing transport facilities is provided in Section 2.2 (Existing infrastructure) and Section 6.1 (Traffic and transport).

Community values

Community values relate to those things held as important to residents for quality of life and wellbeing. They include physical elements such as parks, landscapes and pedestrian connectivity, and intangible qualities such as sense of place and community cohesion.

Local amenity in the study area is generally characterised by a diversity of land uses including inner-city residential neighbourhoods; community facilities such as open space and parkland; and areas of retail, commercial and industrial uses.

Sydney Park is a historically and culturally significant precinct in the area. Formerly used as a brickmaking site, Sydney Park comprises open space, including wetlands, memorial gardens, and formal and informal recreation facilities. The protection of these cultural heritage values and natural environments is likely to be important to local and regional communities.

Overall, the study area displays high levels of amenity, with good access to transport networks, community facilities of state significance such as universities and hospitals, access to open space and recreation facilities located within Sydney Park, and residential neighbourhoods within easy reach of local services, employment and major centres such as the Sydney CBD.

6.9.3 Potential impacts

Property

Construction and operation of the proposal would take place within the existing road reserve and would not require any property acquisition. Access would be provided to existing properties along King Street, Princes Highway and Sydney Park Road, although minor adjustments may be required to some driveways.

Ancillary facilities would be located at Venice Street, Mascot (Lot 2121, DP 591060) and 12-18 Burrows Road, St Peters (Lot 501, DP1224849). These sites would be used for materials storage and administration purposes. The sites comprise existing industrial uses and use of the sites for the project is consistent with their current use.

The proposal has the potential to generate socio-economic impacts during construction (refer to Section 3.3 for further details). The potential impacts are summarised below.

Local business and industry

During construction, the proposal would have temporary impacts, both beneficial and adverse, on some local businesses closest to proposal area.

Construction of the proposal is likely to have a beneficial impact on some businesses through increased demand for local goods and services. In particular, some local shops and food outlets (e.g. cafes and take-away shops) near the proposal may benefit from increased business in response to the day-to-day needs of construction workers. Businesses supplying goods and services to construction works may also experience benefits from increased construction activity.

Without mitigation, construction noise, dust and construction traffic may have temporary adverse impacts on amenity for some businesses near the proposed works along Princes Highway and King Street. Activities likely to cause the highest noise levels mainly relate to works for utilities relocation, road works and pavement works. The effect of this impact would depend on such things as the nature and type of business, but could include changes to general business ambience. Local amenity changes would likely have the greatest impact on businesses that have outdoor dining or open customer areas such as cafes and restaurants at King Street, Princes Highway and Mitchell Road. Increased noise and dust from construction activities may impact on the use and enjoyment of these outdoor areas for some customers. Other businesses that may experience disruptions to business amenity due to noise, vibration and dust from construction activities include:

- Personal and professional services on the eastern side of Princes Highway at St Peters, including photography studio, dentist, physiotherapist, veterinary clinic, and commercial offices
- Motorcycle and bicycle retailers on the western side of Princes Highway at St Peters
- Tortuga Studios at Princes Highway, St Peters, which includes a gallery and studio space for artists, designers, musicians, and film, television and theatre artisans
- Denture clinic on the western side of Princes Highway at St Peters
- Retail, takeaway and commercial uses at Mitchell Road.

Access to businesses near the proposal would be maintained during construction, although temporary changes to local roads and footpaths (e.g. lane closures, changes to on-street parking zones and pedestrian and cyclist access) could temporarily impact access to some businesses for workers, customers and service vehicles.

The proposal would result in the loss of on-street parking along some sections of the Princes Highway, with potential temporary impacts likely on remaining on-street parking. A reduction in on-street parking would particularly impact customers, staff and delivery drivers of businesses with no or limited on-site parking. This may make finding a convenient car park more difficult for some customers, staff and delivery drivers of businesses near the proposal and potentially require some people to walk further to access businesses. The need to walk further or take longer to search for a convenient car park may deter some people from accessing some businesses, particularly where visits are for a short duration or where goods or services are readily available from other nearby locations with easier and more convenient parking access.

Employment

During construction, the proposal would impact positively on employment through the creation of direct construction related employment opportunities and indirect employment opportunities in businesses and industries that support the construction work. The construction workforce would vary depending on the stage of construction and associated activities, although is expected to be between about 35 personnel and 40 personnel at any given time. Increased employment opportunities locally may assist in supporting improved social and economic outcomes for some individuals.

Social infrastructure

During construction, potential impacts on social infrastructure would mainly relate to temporary access changes and amenity impacts on Sydney Park associated with construction noise and dust.

Access would be maintained to social infrastructure near the proposal, although traffic disruptions and changes to local roads may temporarily change accessibility to some social infrastructure near the proposal and in the broader study area. Any impacts are expected to be minor and are not expected to impact on the overall use of social infrastructure.

Noise and dust from construction activities has potential to impact on the use and enjoyment of some recreation facilities and other spaces within Sydney Park, particularly those located near Sydney Park Road and the Princes Highway / King Street intersection. Any impacts on amenity are generally expected to be minor and occur for a short period, that is, only while construction is taking place.

Further discussion of potential amenity impacts is provided in Section 6.2 (Noise and vibration) and Section 6.8 (Landscape character and visual impacts), while changes to local access are discussed in detail in Section 6.1 (Traffic and transport).

Community values

Temporary changes to local amenity may be experienced by residents, staff and customers of local businesses, and users of social infrastructure near the proposal due to construction noise, vibration and dust, out of hours' construction work and the presence of construction work sites and activities.

Reduced amenity may temporarily impact on the use and enjoyment of some residential properties, businesses and community facilities closed to the proposed works, particularly within outdoor areas. A number of high-density residential units and apartments are located near to the proposal.

Construction works would mainly be undertaken during standard daytime work hours, although some construction activities associated with works in the road median and to support temporary traffic changes, would need to be undertaken outside of these hours, for example at night and weekends, to minimise traffic impacts. Noise and lighting from night works may temporarily impact on night- time amenity or disrupt sleeping patterns for some residents closest to the construction works.

Ancillary facilities would be located at Venice Street, Mascot and Burrows Road, St Peters, which would be used for materials storage and administration purposes. The sites are surrounded by industrial land uses and potential impacts from the use of these sites are expected to be negligible.

During construction, there is the potential for unintended impacts on heritage buildings and structures next to the proposal area due to the use of construction machinery and vehicles nearby. These impacts would generally be managed with the implementation of safeguards and management measures.

Access and connectivity

As discussed in Section 6.1, potential impacts on access and connectivity would generally relate to:

- Traffic delays and disruptions for motorists, including from lane closures and an increase in construction vehicles
- Minor increases in travel times for bus users
- Changes to road conditions, potentially impacting on perceptions of road safety
- Changes to pedestrian and cycle access near to construction works, including temporary changes to footpaths, resulting in possible disruptions or impacts on safety for some users.

Traffic flow would be maintained through the proposal throughout construction, although construction activities may result in temporary delays and disruptions for some motorists, cyclists and pedestrians. This may cause a level of inconvenience for some motorists although impact on the overall road network is expected to be minor.

Access for pedestrians and cyclists would be maintained near to construction works, although temporary access changes, including diversion of pedestrian and cycle paths, may be required for safety. However, for residents and workers who walk or cycle as part of their journey to work, the temporary access changes

may impact on perceptions of safety or cause delays and disruptions. Management measures would be implemented near to construction works to minimise impacts on pedestrians and cyclists. Minimising the extent and length of pedestrian and cycle path diversions would also be important in minimising potential impacts on pedestrians and cyclists.

As indicated in Section 6.9.2, public transport is an important mode of transport for residents and workers in the study area. Potential impacts on bus users would mainly be associated with minor increases in travel times due to changed road conditions and increased congestion. Any disruptions to bus services during construction are expected to be minimal and are not expected to impact on bus use or the wider bus network. Existing bus stops are expected to remain operational during construction. Changes to public transport services, such as temporary relocation of bus stops, would be carried out in consultation with City of Sydney Council, Inner West Council, Transport for NSW and the local bus operator. Any proposed relocation of bus stops would be located as close as possible to the existing location to minimise potential impacts on local residents and commuters, although some bus users may be required to walk further to access bus services.

Access to private properties near to construction works would be maintained during construction. Where temporary changes are required, suitable access arrangements would be implemented in consultation with affected property and business owners.

A detailed assessment of potential construction traffic impacts on local access and connectivity is provided in Section 6.1(Traffic and transport).

Operation

The proposal would have both wider regional and local benefits through improved safety for all road users and improved access and connectivity for pedestrians and cyclists. However, the proposal would also result in some changes to the existing socio-economic environment for communities and businesses within the study area and the wider region. These impacts are summarised below.

Local business and industry

Operation of the proposal would result in reduced traffic volumes on King Street (south of Lord Street), Princes Highway (north of Campbell Street), Sydney Park Road and Mitchell Street. The reduction in the number of motorists travelling past businesses on these roads would potentially impact on businesses that rely on passing trade for their customers. Businesses along these roads mainly comprise service-related businesses (for example financial services, automotive repairs), specialty retailers (for example, bicycle and pet stores) and cafes and restaurants. The nature of these businesses means that they are likely to have a lower reliance on passing customers for their business and are more likely to attract customers that specifically choose to access these businesses due to factors such as convenience to home or work. Customers of these businesses are likely to benefit from improved access provided by reduced traffic volumes on these roads and enhancements to the overall business amenity.

The main exception to this is the service station at Princes Highway and Barwon Park Road. It is expected that a proportion of customers to this business would be from motorists travelling along Princes Highway. A reduction in traffic volumes on King Street and Princes Highway may impact on the level of passing customers for this business. At the same time, it is likely that this service station would attract customers from surrounding residential and commercial uses, with the nearest alternate service station located on Princes Highway about one kilometre south. A reduction in traffic on King Street and Princes Highway and new traffic signals at the intersection of Barwon Park Road and Princes Highway is likely to make access to this business easier for some residents and workers in the surrounding area.

On-street parking access to local businesses for customers, staff and deliveries would be slightly reduced along King Street, Princes Highway and Sydney Park Road. Parking restrictions would generally be in accordance with current clearway hours restrictions. This has the potential to impact customers, staff and delivery drivers of businesses with no or limited on-site parking and may reduce the convenience of businesses for some customers, particularly where visits are for a short duration. This would be balanced in part by an increase improved access for people who pedestrians and cyclists, which may encourage some people to walk or cycle for some local trips they otherwise would not. On-street parking towards the eastern

section of May Street would also be increased as a result of the proposal, which would provide a sufficient alternative to parking on King Street, Princes Highway or Sydney Park Road.

During operation, businesses near the proposal would benefit from enhanced urban amenity and streetscape improvements, including widened footpaths and additional landscaping. The character of these corridors is currently compromised by high traffic volumes. A reduction in traffic using King Street, Princes Highway and Sydney Park Road and associated road traffic noise and landscape improvements along the proposal would support improved safety and amenity for customers of businesses along these roads. The provision of community spaces along Princes Highway as part of the project would also provide opportunities for temporary commercial uses such as eateries (for example, food trucks) to be established. This would impact positively on the local business environment and surrounding businesses by contributing to the amenity, vitality and vibrancy of the streetscape, particularly outside of the normal trading hours of existing service related businesses. These changes would contribute to the attractiveness of the local business environment and commercial properties near the proposal and support opportunities to revitalise the business environment of this area and attract new businesses and customers.

Social infrastructure

The proposal would improve safety, access and connectivity for pedestrians and cyclists to social infrastructure in the study area, including facilities within Sydney Park. In particular, the proposal would provide safer and more convenient access to Sydney Park for pedestrians and cyclists through the provision of crossing facilities at key intersections along King Street and Princes Highway as well as signalised pedestrian and cycle crossings of King Street, Princes Highway and Sydney Park Road. An increase in on-street parking along Sydney Park Road would also enhance access for motorists to Sydney Park. The importance of pedestrian access into Sydney Park and surrounding areas was identified during stakeholder consultation for the project. Improved connectivity to Sydney Park would enhance access to formal and informal recreation facilities and open space for residents and workers of surrounding suburbs.

Access to the Sydney Park car park along Sydney Park Road would be altered through the provision of right-turn movements from Sydney Park Road into the car park in the eastbound direction and the restriction of right-turn movements from the car park to Sydney Park Road. This would improve access and safety for motorists travelling from suburbs west of the park. Car park users who want to travel east would need to use Mitchell Street and Maddox Street to travel to Euston Road. This may cause an inconvenience for some motorists, but is not expected to deter people using the park.

The proposal would also support enhanced landscape, visual and urban amenity within Sydney Park through the reduction in traffic lanes and traffic volumes on Princes Highway, King Street and Sydney Park Road and landscape improvements along the proposal. This would benefit users of Sydney Park by contributing to the attractiveness of the park for informal recreation and leisure activities and the sense of peacefulness and tranquillity in areas used for reflection and remembrance such as the acquired immune deficiency syndrome (AIDS) memorial grove.

Community values

The proposal would have beneficial impacts on safety and amenity for pedestrian and cyclists in the study area through the reduction in traffic lanes, provision of pedestrian and cycle crossings, and landscaping and streetscape enhancements. This would support opportunities for social interaction, by making some local trips by walking and bicycle more attractive, and opportunities to increase community wellbeing through improved access to recreation and leisure facilities within the study area.

Safer and easier access for pedestrians and cyclists would also help to encourage increased walking and cycling trips which would contribute positively to levels of physical activity in the community and general well-being.

New street trees and landscaping enhancements provided by the proposal would contribute positively to community values relating to landscape, visual and streetscape amenity with the study area, particularly associated with Sydney Park. Sydney Park is an important community facility and landscape feature within the study area. The proposal would visually link new areas of landscaping with the existing Sydney Park parkland and provide opportunities to extend and enhance existing avenues of trees and canopy cover for pedestrians along the proposal area. The provision of community spaces along Princes Highway as part of

the project would also contribute positively to the amenity and vibrancy of the streetscape and provide opportunities for social interaction.

The reduction in traffic on King Street, Princes Highway and Sydney Park Road would help to reduce road traffic noise along the proposal corridor, resulting in beneficial impacts for residents and businesses near the proposal. This would also benefit night-time amenity at residential properties along the proposal, reducing the potential for disrupted sleeping patterns for residents. Reduced traffic along King Street, Princes Highway and Sydney Park Road would also lead to improvements in air quality with a reduction in vehicle emissions, impacting positively on local amenity.

The proposal would reduce the perceived barrier effect of the road corridor and improve connectivity between Sydney Park and surrounding residential and commercial areas for pedestrians and cyclists.

Access and connectivity

Operation of the proposal would have positive impacts on local access and connectivity for residents, workers and visitors in the study area and surrounding region. The proposal would enhance pedestrian and cycle access and connectivity within the study area through the upgrade of existing facilities (such as widening of footpaths and shared paths), provision of new facilities (such as shared paths, signalised/unsignalised pedestrian and cycle crossings and the on-road separated cycleway along Sydney Park Road), and improvements to the pedestrian environment (such as new landscaping). The reduction in traffic lanes and traffic volumes along King Street, Princes Highway and Sydney Park Road would also support a safer and more attractive environment for pedestrians and cyclists.

At a regional level, the proposal would provide connections to the existing regional cycle network, supporting improved connectivity to key destinations within the study area and to employment destinations such as the Sydney CBD. Integration with existing and future cycling networks was identified during stakeholder consultation for the project. Improved connectivity to the regional cycle network and safer and more convenient access for pedestrians and cyclists would encourage residents, workers and visitors to walk and cycle for commuting, recreation and leisure purposes. Improved pedestrian and cycle facilities is likely to encourage a further shift away from private vehicles for some trips and less reliance on private vehicles for commuting, helping to reduce traffic congestion within the study area and surrounding region.

Enhanced pedestrian and cycle facilities provided by the proposal would also support improved access for groups such as young people, students, non-drivers, and households without access or with limited access to a private vehicle. The proposal would improve the safety and convenience of walking and cycling and quality of trips for people that rely on walking and cycling as their primary mode of transport or to access other transport modes such as public transport.

The proposal would restrict right-turn movements at some intersections, requiring some drivers to use alternate routes to access local streets. Reduced lane capacity on Princes Highway, King Street and Sydney Park Road would resulting in impacts on the performance of intersections along these roads during the morning and evening weekday peak periods, impacting on levels of congestion or cause changes such as timing of travel to avoid the peak period (‘peak spreading’), re-routing of trips to avoid congestion, or deciding not to take some trips. Increased congestion on local roads may also encourage some people to use alternate modes for their trips, such as walking, cycling or public transport. However, the opening of the WestConnex M4-M5 Link and Sydney Gateway in 2022 and 2023 would result in improvements to the overall road network. Impacts on motorists from the proposal would be balanced by improvements in local amenity and active transport access, including:

- Enhanced attractiveness of walking and cycling, due to the introduction of new crossings, dedicated cycle paths, widened footpaths and landscaping
- Road user safety improvements, due to the introduction of new crossings, dedicated cycle paths, widened footpaths, and reductions in speed limits
- Environmental improvements such as increased vegetation cover, separation of heavy vehicles and reductions in traffic noise and air pollution
- Changes to the character and form of the streetscape, to improve permeability and scale.

On-street parking would slightly reduce along King Street, Princes Highway and Sydney Park Road, and would generally be in accordance with current clearway restrictions. The proposal would increase on-street parking along the eastern side of May Street, towards King Street. The reduction in overall on-street parking within the proposal area may increase pressure on parking in some surrounding streets, impacting on the availability of parking for surrounding uses, although any potential impacts are likely to be similar to the current situation. The provision of new parallel parking along the eastern section of Sydney Park Road would have beneficial impacts for nearby residents and their visitors.

6.9.4 Evaluation of significance

Once complete, the proposal would enhance pedestrian and cycle access and connectivity within the study area and the wider region. Reducing traffic lanes along King Street, Princes Highway and Sydney Park Road would provide a safer, convenient and more attractive environment for pedestrians and cyclists and allow improved connectivity to the regional cycle network. Safer and easier access for pedestrians and cyclists would contribute to a range of social benefits for local and regional communities, including:

- An increase in walking and cycling for residents, workers and visitors, contributing positively to general levels of physical activity for children and adults and community health outcomes for local and regional communities
- Improved access and quality of trips for groups such as young people, students, non-drivers, and households without access or with limited access to a private vehicle as well as people that rely on walking and cycling as their primary mode of transport
- Opportunities for social interaction, by making some local trips by walking and bicycle more attractive, encouraging people to make trips they may have otherwise avoided, and improving access to meeting and gathering places such as Sydney Park
- Opportunities to increase community wellbeing through improved access to recreation and leisure facilities within the study area

The proposal would also improve access to community facilities such as Sydney Park, supporting enhanced access to formal and informal recreation facilities and open space for residents and workers of surrounding suburbs. New street trees and other landscaping enhancements provided by the proposal would also contribute positively to community values relating to landscape, visual and streetscape amenity with the study area, particularly associated with Sydney Park.

Table 6-41 provides an evaluation of the proposal's negative socio-economic impacts from construction and operation.

Table 6-41 Evaluation of significance

Impact	Summary of impact	Impact significance (without mitigation)			Management measure	Impact significance (with mitigation)		
		Sensitivity	Magnitude	Significance		Sensitivity	Magnitude	Significance
Construction impacts								
Business impacts	Impact on local business amenity for businesses near the proposal	Moderate	Moderate	Moderate	• Implementation of environmental management measures (e.g. noise, vibration, dust measures) • Consultation and communication with local businesses	Moderate	Low	Moderate-low
	Impacts on business access due to temporary changes to roads and footpaths	Moderate	Moderate	Moderate	• Implementation of traffic management measures • Consultation and communication with local businesses	Moderate	Low	Moderate-low
	Impact on on-street parking for customers, staff and deliveries	Moderate	Moderate	Moderate	• Maintain on-street car parking during construction where possible	Moderate	Low	Moderate-low

Impact	Summary of impact	Impact significance (without mitigation)			Management measure	Impact significance (with mitigation)		
		Sensitivity	Magnitude	Significance		Sensitivity	Magnitude	Significance
Social infrastructure	Impacts on access to social infrastructure due to temporary changes to roads and footpaths	Low	Moderate	Moderate-low	• Implementation of traffic management measures • Communication with communities and social infrastructure users	Low	Low	Low
	Amenity impacts due to noise and dust	Low	Low	Low	• Implementation of environmental management measures (e.g. noise, vibration, dust measures) • Communication with local communities and social infrastructure users	Low	Negligible	Negligible
Community values	Temporary reductions in local amenity for residents	Moderate	Low	Moderate-low	• Implementation of environmental management measures (e.g. noise, vibration, dust measures) • Consultation and communication with local residents about proposed works	Moderate	Negligible	Negligible

Impact	Summary of impact	Impact significance (without mitigation)			Management measure	Impact significance (with mitigation)		
		Sensitivity	Magnitude	Significance		Sensitivity	Magnitude	Significance
	Impacts on night-time amenity and sleep disturbance	Moderate	Moderate	Moderate	• Implementation of environmental management measures in the Noise and Vibration Management Plan • Consultation and communication with local residents about proposed works	Moderate	Low	Moderate
Access and connectivity	Temporary delays and disruptions for motorists	Low	Moderate	Moderate-low	• Implementation of traffic management measures • Communication with local communities and transport users	Low	Low	Low
	Impacts on individuals' perceptions of road safety due to the presence of construction works and access changes	Low	Low	Low	• Implementation of traffic management measures • Communication with local communities and transport users	Low	Negligible	Negligible

Impact	Summary of impact	Impact significance (without mitigation)			Management measure	Impact significance (with mitigation)		
		Sensitivity	Magnitude	Significance		Sensitivity	Magnitude	Significance
	Impact on public transport services due to road changes and temporary changes to bus stops	Low	Low	Low	• Implementation of traffic management measures • Communication with local communities and transport users	Low	Negligible	Negligible
	Temporary changes to private property access	Low	Low	Low	• Implementation of traffic management measures • Communication with local communities and transport users	Low	Negligible	Negligible
Operational impacts								
Business impacts	Potential reduction in passing trade due to reduction in traffic volumes	Low	Low	Low		Low	Low	Low
	Reduction in on-street parking	Moderate	Low	Moderate		Moderate	Low	Low-moderate
Social infrastructure	Access changes for motorists using the car park for Sydney Park	Low	Low	Low		Low	Low	Low

Impact	Summary of impact	Impact significance (without mitigation)			Management measure	Impact significance (with mitigation)		
		Sensitivity	Magnitude	Significance		Sensitivity	Magnitude	Significance
Access and connectivity	Reduction in on-street parking increasing pressure on surrounding streets	Low	Low	Low		Low	Low	Low
	Impacts on intersection performance and congestion levels	Low	Moderate	Low-moderate	Undertake ongoing network optimisation by minimising intersection and midblock delays	Low	Low	Low

6.9.5 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Community engagement	Prepare and implement a Communication and Stakeholder Engagement Plan (CSEP) in accordance with the *Community Involvement and Communications Resource Manual* (RTA, 2008) as part of the CEMP to help provide timely and accurate information to the community during construction. The CSEP should include (as a minimum): • Mechanisms to provide details, timing and likely impact of proposed activities to affected residents, businesses and the community, including changed traffic and access conditions and interruptions to utility services • Complaints handling procedure, including the contact name and number for complaints.	Contractor	Pre-construction	Core safeguard SE1 Section 3.7 of QA *G36 Environment Protection*
Community engagement	Notify local residents and potentially affected businesses before the work starts regarding the timing, duration and likely impact of construction activities, including interruptions to utility services.	Contractor	Pre-construction /Construction	Core safeguard SE2 Section 3.7 of QA *G36 Environment Protection*
Business impacts	Maintain pedestrian and vehicle access to businesses near to construction works for the duration of construction. Where temporary changes are required, these will be identified in consultation with the property owner and business owner.	Contractor	Construction	Additional safeguard SE3
Access and connectivity	Consult with bus operators and notify bus commuters about any changes to public transport facilities (for example, bus stops) prior to relocation of any bus stops.	Contractor	Pre-construction	Additional safeguard SE4

Other safeguards and management measures that would address socio-economic impacts are identified in Section 6.1 (Traffic and transport), Section 6.2 (Noise and vibration), Section 6.8 (Landscape character and visual amenity) and Section 6.9 (Other impacts).

6.10 Other impacts

6.10.1 Existing environment and potential impacts

Environmental factor	Existing environment	Potential impacts
Topography, geology and soils	The topography of the study area is gently undulating, with land generally sloping towards the east, west, south and north across the length of the proposal area. Elevations in the proposal area range from 21 metres AHD at the intersection of Sydney Park Road and King Street to eight metres AHD at the eastern end of Sydney Park Road. Along King Street/Princes Highway, the elevations generally grade down towards the south to an elevation of 15.5 metres AHD at the intersection with Campbell Street. The topography in the study area is defined by a natural ridgeline which runs along King Street, Newtown, from the north west to the south east and intersects the corner of King Street, Sydney Park Road and the north western corner of Sydney Park. The topography in Sydney Park is an extension of this ridge, with additional man-made landforms created by former landfilling and reinstatement works. The ridge then runs in a south westerly direction roughly in line with King Street/Princes Highway. Based on the *1:100,000 Sydney Geological Sheet* (Herbert, 1983) the proposal area is mapped as being underlain primarily by Triassic Ashfield shale, consisting of black to dark-grey shale and laminate. In the eastern half of the proposal area, this sequence is overlain by Quaternary aged alluvium consisting of fine to medium grained marine sands known as the Botany Sands. Reference to the *1:100 000 Soil Landscape Series Sheet for Sydney* (9130) (Chapman & Murphy, 1989) indicates that the proposal area is underlain by the Tuggerah landscape (in the east), the Blacktown landscape (in the west) and disturbed terrain (in the south). There is likely to be areas of fill within and adjacent to the proposal area due to the long history of disturbance and development in the locality, as discussed in Section 6.5.	The geology of the site is not anticipated to be impacted by construction of the proposal. During construction, the potential impact on soil from construction activities would be primarily associated with soil loss from erosion of exposed soils and stockpiles and potential sedimentation of surrounding land and waterways. Construction activities would include vehicle movements, stockpiling, excavation, importation of fill material and vegetation removal. Without effective mitigation, these and related construction activities would give rise to potential for erosion of unconsolidated material and entrainment by runoff and subsequent transportation offsite. Soils transported into local drainage channels could lead to degraded water quality, increased sedimentation and reduced hydraulic capacity. Given the minor nature of soil disturbance and vegetation removal required for the proposal, and the implementation of appropriate safeguard and management measures outlined in Section 6.10.2 below, the potential impact to geology and soils from the proposal is considered to be minor. Once the proposal is operational, the potential for soil erosion would be minimal as all areas impacted during construction would be asphalted, paved, landscaped or revegetated to avoid soil erosion from occurring.

Environmental factor	Existing environment	Potential impacts
	No salinity hazard maps are listed in the Marrickville LEP or the Sydney LEP and the DPIE eSPADE database does not identify any saline soils within the study area.	
Air quality and greenhouse gas	Ambient air quality at the proposal area is mainly influenced by local sources, including traffic, commercial activities (e.g. service stations), construction, manufacturing and the release of landfill gases and toxic vapours from historical landfill sites (e.g. Sydney Park and the St Peters Interchange) (refer to Section 6.5.2). Regional influences include Sydney Airport, traffic, commercial activities, construction and manufacturing within the Inner West and Sydney LGAs. The main air pollutants from motor vehicles are carbon monoxide (CO), oxides of nitrogen (including nitrogen dioxide (NO_2)) and fine particles ($PM_{2.5}$ and PM_{10}, i.e. particulate matter with equivalent aerodynamic diameters of less than 2.5 and 10 microns respectively) and Volatile organic compounds (VOCs). Primary pollutants associated with other local and regional influences include carbon monoxide, VOCs, landfill gases (e.g. methane, carbon monoxide, hydrogen sulphide), toxic vapours, inorganic gases like sulphur dioxide and nitrogen oxides, particulate matter and deposited dust.	During construction, air quality impacts would potentially occur in the vicinity of the proposal and would be dependent upon atmospheric conditions. The proposal would have potential to generate short-term dust emissions from earthworks, stockpiles and the use of imported fill. Levels of air borne dust would be expected to be low and unlikely to cause concern to sensitive receivers, provided the safeguards and management measures provided in Section 7.2 are implemented. The use of construction plant and equipment would emit exhaust fumes and contribute to local air quality. In the context of existing air pollution from other local and regional sources, and the short duration of the construction period, these impacts are considered to be minor. Odours may be generated during application of asphalt and line marking and may affect nearby sensitive receivers. These impacts would be short term, limited to a few days when such works occur, and only likely to affect the immediate vicinity of the work area. The excavation and disturbance of contaminated land may potentially generate toxic vapours and release hazardous landfill gases, as described in Section 0. Landfill gases may cause odour impacts at surrounding sensitive receivers. These impacts could continue throughout the operation of the proposal. Impacts from hazardous ground gases or vapours would be managed through safeguards and management measures specified in the OEMP. During operation there would be potential impacts to air quality associated with motor vehicle emissions arising

Environmental factor	Existing environment	Potential impacts
		from changes in volumes of motor vehicles and modes of travel. The potential operational air quality impacts were quantified and assessed using the Transport for NSW *Tool for Roadside Air Quality* (TRAQ) prediction model, with the impact evaluated by comparing predictions against criteria developed using guidance from the EPA *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2016). Near roadside concentrations of key air quality indicators along King Street/Princes Highway (between Sydney Park Road and May Street) and Sydney Park Road (between Mitchell Road and King Street) were predicted under existing (2021) and future (2023 and 2033) scenarios. The results from the TRAQ modelling indicate that near roadside concentrations of all air quality indicators for both road sections are expected to decrease significantly during operation. Concentrations of CO, NO_2 and PM_{10} are predicted to reduce by approximately 10 per cent from 2021 to 2033. A summary of the input parameters and predicted operational air quality impact from the TRAQ model is presented in Appendix L.

Environmental factor	Existing environment	Potential impacts
Waste and resource use	Transport for NSW is committed to the responsible management of unavoidable waste and to promote the reuse of such waste in accordance with the resource management hierarchy principles outlined in the *Waste Avoidance and Resource Recovery Act 2000*. These resource management hierarchy principles, in order of priority are: • Avoidance of unnecessary resource consumption • Resource recovery (including reuse, reprocessing, recycling and energy recovery) • Disposal. By adopting the above principles, Transport for NSW aims to efficiently reduce resource use, reduce costs, and reduce environmental harm in accordance with the principles of ecologically sustainable development. The roads and pedestrian pathways within the proposal area create very little waste. This generally consists of some green waste associated with the maintenance of roadside vegetation, roadside litter from motorists and other road users and, possibly, material from clearing roadside drainage.	Waste streams likely to be generated during construction of the proposal include: • General building materials waste such as excess concrete and asphalt, redundant pieces of pipe-fittings, timber, plastic and metals • Excess spoil from excavations (where spoil is not suitable for backfilling) • Green waste generated during vegetation trimming and removal • Domestic waste including food scraps, aluminium cans, glass bottles, plastic and paper containers, and putrescible waste generated by site construction personnel • Packaging materials from items delivered to site, such as pallets, crates, cartons, plastics and wrapping materials • Contaminated or chemical waste: there is potential for contaminated waste to be uncovered during the works (refer to Section 6.5). If this is exposed, it would be removed to a licensed facility by a licensed contractor • Redundant sediment and erosion controls such as silt fences • Wastewater generated from wash-downs and bunded areas • Waste oils, liquids and fuels from maintenance of construction plant and equipment. All waste would be managed in accordance with Transport for NSW and EPA guidelines and disposed of by a licensed contractor to an appropriately licensed facility. The waste associated with the operation of the proposal is not be expected to change from the existing environment.

Environmental factor	Existing environment	Potential impacts
Hazards and risk management	Existing hazards and risks are associated with operation of the road network and include the risk of crashes.	Hazards and risks associated with construction include: • Environmental hazards and risks, including: – Spills or leakage of contaminants such as fuels, chemicals and hazardous substances entering surface and groundwater or contaminating soils – The excavation and disturbance of contaminated land during construction may potentially release hazardous landfill gases that could represent an explosion risk to construction workers and the general public (as described in Section 0) – Discharge of turbid run-off, resulting in pollution of waterways – Encountering utilities or contaminated material during earthworks – Spread of noxious weed material – Changed traffic conditions leading to incidents, including the movement of heavy vehicles through the proposal area including in potentially reduced lane widths • Health and safety hazards and risks – including any activity or outcome that may affect the health and/or safety of construction personnel or the community, such as the release of toxic vapours and hazardous landfill gases. Impacts from environmental, health and safety hazards would be managed through the safeguards and management measures described in Section 7.2.

6.10.2 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Topography, geology and soils	Prepare and implement a Soil and Water Management Plan (SWMP) as part of the CEMP. The SWMP should identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction.	Contractor	Pre-construction	Additional safeguard O1 Section 2.1 of QA *G38 Soil and Water Management*
Topography, geology and soils	Prepare and implement a site-specific Erosion and Sediment Control Plan (ESCP) in accordance with the *'Blue Book' Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) as part of the SWMP. The ESCP should be updated throughout construction so it remains relevant to the activities. The ESCP measures should be implemented prior to commencement of works and maintained throughout construction.	Contractor	Pre-construction	Additional safeguard O2 Section 2.2 of QA *G38 Soil and Water Management*
Topography, geology and soils	Prepare and implement spoil and fill management measures as part of the CEMP. The CEMP should identify the locations of spoil and fill stockpiles, sources of imported fill, and methods to re-use or dispose of excess or unsuitable spoil material including estimated volumes and disposal sites. Any excess soil or excavated material that cannot be used on site should be classified and managed in accordance with the EPA *Waste Classification Guidelines* (NSW EPA, 2014) and disposed of at an appropriately licensed waste facility.	Contractor	Pre-construction	Additional safeguard O3
Air quality	Prepare and implement an Air Quality Management Plan (AQMP) as part of the CEMP. The AQMP should include, but not be limited to: • a map identifying locations of sensitive receivers • identification of potential risks/impacts due to work/activities • mitigation and suppression measures to be implemented, including a progressive rehabilitation strategy for exposed surfaces. • methods to manage work during strong winds or other adverse weather conditions • a process for altering management measures as required	Contractor	Detailed design / pre-construction	Core standard safeguard O4 Section 4.2 of QA *G36 Environment Protection*

Impact	Environmental safeguards	Responsibility	Timing	Reference
Waste and resource use	Prepare and implement a Waste Management Plan (WMP) as part of the CEMP. The WMP should include, but not be limited to: • measures to avoid and minimise waste associated with the project • classification of wastes and management options (re-use, recycle, stockpile, disposal) • statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions • procedures for storage, transport and disposal • monitoring, record keeping and reporting. The WMP should be prepared taking into account the *Environmental Procedure - Management of Wastes on Roads and Maritime Services Land* (Roads and Maritime Services, 2014b) and Transport for NSW Waste Fact Sheets.	Contractor	Detailed design / pre-construction	Core standard safeguard O5 Section 4.2 of QA *G36 Environment Protection*
Existing condition of ancillary sites	Undertake a pre-construction land assessment prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) to identify the presence of any pre-existing wastes or stored materials. The assessment should be prepared in accordance with the Transport for NSW *Management of road construction and maintenance wastes* (Roads and Maritime Services, 2016).	Contractor	Pre-construction	Core standard safeguard O6 Section 4.15 of QA *G36 Environment Protection*
Waste and resource use	Sample and manage waste materials (such as soils and aggregates) generated during the construction of the proposal that would be exported for use on another construction site or project in accordance with relevant resource recovery orders and exemptions as issued by the NSW EPA.	Contractor	Construction	Core standard safeguard O7 Section 4.11 of QA *G36 Environment Protection*
Utilities	Prior to the commencement of work: • Confirm the location of existing utilities and relocation details in consultation with the affected utility owners • Undertake further assessment if the scope or location of proposed utility relocation work falls outside the assessed proposal scope and footprint	Contractor	Detailed design / pre-construction	Additional safeguard O8

Impact	Environmental safeguards	Responsibility	Timing	Reference
Hazards and risk management	Prepare and implement a Hazard and Risk Management Plan (HRMP) as part of the CEMP in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice, and EPA or NSW Department of Planning, Industry and Environment (DPIE) publications. The HRMP should include, but not be limited to: • Details of hazards and risks associated with the activity • Measures to be implemented during construction to minimise these risks • Record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • A monitoring program to assess performance in managing the identified risks • Contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations.	Contractor	Detailed design / pre-construction	Additional safeguard O9
Hazards and risk management	Manage health and safety risks during construction by implementing standard workplace health and safety requirements. Manage construction sites in accordance with the requirements of the Safe Work Australia, the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011*.	Contractor	Construction	Additional safeguard O10

6.11 Cumulative impacts

Cumulative impacts have the potential to arise from the interaction of individual elements within the proposal and the additive effects of the proposal with other external projects. Transport for NSW is required under clause 228 (2) of the *Environmental Planning and Assessment Regulation 2000*, to take into account potential cumulative impacts as a result of the proposal. The potential cumulative impacts of the proposal are assessed below.

6.11.1 Study area

The study area used for the assessment of cumulative impacts has been defined by identifying other developments or activities that are underway or are likely to commence during the proposal's scheduled construction timeframe within the suburbs of St Peters, Newtown, Erskineville and Alexandria.

Proposed developments with the potential for cumulative impacts with the proposal were identified through:

- A search of the DPIE major projects register on 21 June 2021
- A search of the Independent Planning Commission of NSW's project register for City of Sydney and Inner West LGAs on 21 June 2021
- A search of the Development Application Registers for City of Sydney Council and Inner West Council and projects listed on the Transport for NSW website
- A review of background documents including planning strategies and major facility master plans.

Relevant projects are described in Table 6-42 and sections below.

Table 6-42 Past, present and future projects

Project	Construction impacts	Operational impacts
M4-M5 Link Tunnels, M4-M5 Link, WestConnex (Transport for NSW) The M4-M5 Link Tunnels are currently being constructed as part of M4-M5 Link project of WestConnex and will connect the New M4 at Haberfield with the M8 Motorway (Stage 1) at St Peters. The works involve: • The construction of twin mainline tunnels that will generally accommodate up to 4 lanes of traffic in each direction • The construction of tunnel connection points that will lead to the future Rozelle Interchange and Iron Cove Link • The construction of a Motorway Operations Complex including a ventilation facility at Campbell Road, St Peters • Surface road works to connect to the existing road network. The M4-M5 Link Tunnels team started tunnelling from the Campbell Road civil and tunnel site in May 2019 and continued work into the St Peters area heading towards Newtown during 2020. Construction of the project is expected to be completed by 2023.	The proposed tunnels will pass underneath the Princes Highway just north of its intersection with Short Street. Tunnelling activities are approved to take place 24 hours a day, seven days a week. There is potential for the construction works period to overlap with that of the proposal and as such cumulative construction impacts would be possible. Some residents above the tunnels may notice some temporary additional vibration and noise impacts where activities are directly below or nearby their property. There is also the potential for temporary cumulative traffic and transport impacts due to increased construction traffic on Princes Highway and Campbell Road near the Campbell Road civil and tunnel site. Impacts would be limited to increased congestion and travel times on the road network near the proposal.	Cumulative operational impacts are likely to include a decrease in heavy vehicle traffic on the local road network, reduced congestion, increased road safety and reduced travel times across the region. An increase in traffic volumes are expected on Euston Road and Campbell Road/Campbell Street due to vehicles travelling to and from the St Peters interchange.

Project	Construction impacts	Operational impacts
Sydney Gateway (Transport for NSW and Sydney Airport Corporation Limited) Transport for NSW and Sydney Airport Corporation Limited propose to build new direct high capacity road connections linking the Sydney motorway network at the St Peters interchange with Sydney Airport's domestic and international terminals and beyond. It includes new sections of high capacity road connections linking the Sydney motorway network at the St Peters Interchange with Terminal 1 and Airport Drive in the south, and Qantas Drive and Terminals 2/3 in the east. It also includes new bridges over the Alexandra Canal and active transport connections. It is anticipated that construction would start in 2021 and take about 3.5 years to complete.	The proposed development is located about 570 metres south of the proposal. The construction period could potentially overlap with that of the proposal and as such cumulative construction impacts would be possible. Temporary cumulative construction impacts would include noise and vibration impacts on surrounding receivers, visual amenity impacts, air quality impacts resulting from dust and construction vehicle emissions and increased construction traffic on the local road network near Campbell Road and Princes Highway.	Cumulative operational impacts are likely to include a decrease in heavy vehicle traffic on the local road network, reduced congestion, increased road safety and reduced travel times across the region. An increase in traffic volumes are expected on Euston Road and Campbell Road/Campbell Street due to vehicles travelling to and from the St Peters interchange.
Alexandria to Moore Park (Transport for NSW) Transport for NSW proposes to upgrade major intersections located along the Euston Road, McEvoy Street, Lachlan Street and Dacey Avenue corridor. Stage 1 of the proposal involves the upgrade of four intersections and the introduction of clearways between the Euston Road/Maddox Street intersection in Alexandria and the Anzac Parade/Alison Road/Dacey Avenue intersection in Moore Park. Construction of Stage 1 is expected to commence in 2021 and would take around 36 months to complete.	The proposed development is located about 260 metres north east of the proposal. There is potential for the construction works period for Stage 1 to overlap with that of the proposal and as such cumulative construction impacts would be possible. Temporary cumulative construction impacts would include noise and vibration impacts on surrounding receivers, visual amenity impacts, air quality impacts resulting from dust and construction vehicle emissions and increased construction traffic on the local road network to the north east of the proposal.	Cumulative operational impacts are likely to include improved traffic flow, road safety and trip reliability along Euston Road and the nearby Alexandria to Moore Park road corridor.

Project	Construction impacts	Operational impacts
Visy Dry Recyclables Facility (Visy Industries Australia Pty Ltd) The State Significant Development application for the construction and operation of a waste transfer and materials recovery facility at 112-120 Euston Road, Alexandria was approved in April 2020. The facility would be fully enclosed within an existing industrial building, will all unloading, sorting and processing to be undertaken indoors. Visy Industries is proposing to carry out the development in two stages. Stage 1 would establish a material transfer facility to receive and consolidate recyclable materials from kerbside and commercial collections. Stage 2 would establish a material recovery facility to process the incoming waste materials into separate recyclable material streams. Stage 1 construction will take about three months to complete and was scheduled to commence in the first half of 2020. At the time of writing no information was publicly available about the status of Stage 1 of the construction. Stage 2 construction is anticipated to take about four months. A commencement time for the Stage 2 construction is not yet determined. Once built, the facility will operate 24 hours per day, seven days per week.	The proposed development is located about 250 metres south of the proposal. There is potential for the construction works period to overlap with that of the proposal and as such cumulative construction impacts would be possible. Construction of the proposed development would result in temporary cumulative noise and vibration impacts on surrounding receivers and a minor increase in construction traffic along Euston Road.	Cumulative operational impacts are likely to include a minor increase in road traffic along Euston Road.

Project	Construction impacts	Operational impacts
Woolworths Warehouse and Customer Fulfilment Centre, Marrickville The State Significant Development for the construction and operation of a warehouse and distribution facility for Woolworths located at 74 Edinburgh Road, Marrickville, has been proposed. The proposed development would involve the construction of a two storey warehouse, associated office spaces, a two storey car park and a two storey hardstand loading and delivery area. Construction is expected to commence to 2021. The duration of works was not publicly available during the time of writing.	The proposed development is located approximately 930 metres west of the proposal. There is potential for the construction works period to overlap with that of the proposal and as such cumulative construction impacts would be possible. Temporary cumulative construction impacts would include noise and vibration impacts for sensitive receivers located in between the proposed development and proposal. Air quality impacts resulting from dust and construction vehicle emissions and increased construction traffic would also impact areas located between the proposed development and proposal.	Cumulative operational impacts are likely to include a minor increase in road traffic along Campbell Street.

6.11.2 Broader program of work

As outlined in Section 2.1.2, the proposal is being developed in accordance with approval conditions B44, B50 and B51 of the M8 Motorway (Stage 1) project that forms part of Stage 2 of the WestConnex project.

The closest projects as part of this programme of work is at the intersection of Euston Road and Sydney Park Road at the eastern end of the proposal and at the intersection of Campbell Street with Princes Highway and the western end of the proposal. The design ties into the existing lane configurations at the upgraded intersections and the intersections would remain unchanged.

6.11.3 Other projects and developments

The City of Sydney and Inner West LGAs are undergoing a period of substantial urban renewal, with a range of urban renewal initiatives located near the proposal. A number of other transport projects are also currently under construction or planned in the study area to support this urban renewal and population growth. These are described below.

Ashmore Precinct

The Ashmore Precinct is located in Erskineville and next to Alexandria, bounded by Ashmore Street, Mitchell Road, Coulson Street and the Illawarra Railway line. This project would redevelop an industrial site into a sustainable neighbourhood consisting of about 3,785 homes, a commercial/retail centre, a central park (McPherson Park) and bike links. The development is likely to be completed by 2025.

There is potential for some of the construction works to overlap with that of the proposal and as such cumulative construction impacts such as increased congestion and travel times on the local road network would be possible. Cumulative operation impacts are expected to include additional demand for travel for all customer groups on roads in and near the proposal area, particularly near developments to the north of the proposal.

St Peters Station Upgrade

Planning is currently underway to upgrade St Peters Station as part of the Transport for NSW's Transport Access Program. The aim is to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams and customers with luggage. The project is expected to be completed in 2023. No further details are currently available regarding expected construction dates.

The proposed upgrade of St Peters Station would be carried out immediately adjacent to the proposal. There is potential for the construction works period to overlap with that of the proposal and as such cumulative construction impacts such as noise and vibration, visual amenity, air quality and traffic and access impacts would be possible. Once operational, the proposal would support the proposed accessibility upgrade by improving pedestrian and cyclist access to St Peters Station.

Princes Highway and Railway Road Intersection improvements, Sydenham

Transport for NSW has recently completed improvements to the intersection of Princes Highway and Railway Road at Sydenham as part of the NSW Government's South Pinch Points Program. Construction of the project was completed in April 2020.

Cumulative operational impacts are likely to include improved traffic flow and road safety, as well as reduced travel times across the region.

Mascot Intersections upgrade

Transport for NSW is upgrading five key intersections across Mascot to help reduce congestion and improve road safety. The project is to be delivered in three stages and involves works at the following intersections:

- Bourke Street and Coward Street (Stage One)
- Gardeners Road and Botany Road; Kent Road and Ricketty Street; Kent Road and Coward Street (Stage Two)
- Gardeners Road and O'Riordan Street (Stage Three).

The construction of Stage One is expected to be completed in 2020. Works on Stage Two are currently underway, whereas works on Stage Three will start in late 2020.

The proposed development is located about 1.1 kilometre south east of the proposal. Even if some construction does occur at the same time, there is unlikely to be any noticeable cumulative construction impacts. Cumulative operational impacts once the proposal is operational are likely to include improved traffic flow and road safety, as well as reduced travel times across the region.

Other local development projects

A search of the DA tracking databases for the City of Sydney and Inner West councils was carried out on 1 September 2020. Applications in the study area relate mainly to residential modifications and a number of multi-story residential developments. Many of the developments would be constructed concurrently with the proposal.

6.11.4 Potential impacts

Construction

Construction specific cumulative effects would most likely occur where construction works overlap in terms of timing and/or location. Cumulative effects from construction activities usually relate to noise and vibration, traffic and access, visual amenity and air quality impacts. The scale of the impacts largely depends on the type of work, its duration, and the sensitivity of surrounding land uses.

Projects do not have to overlap in terms of construction timing to have cumulative impacts. If various projects follow progressively and are concentrated in a general locality, there may also be a cumulative effect associated with an overall increased duration of disturbance on sensitive receivers, particularly residents and businesses. This effect is often termed 'construction fatigue'. This is potentially a key issue for the proposal due to the length of the construction program and the concentration of a number of current and planned major development projects in close proximity, particularly the M4-M5 Link, Sydney Gateway and Alexandria to Moore Park projects within one kilometre of the proposal.

It is recognised that the works for the proposal are smaller in scale relative to many other major transport and urban development projects occurring in or near the study area. As such, the contribution of the proposal to potential cumulative impacts relating to such things as construction vehicle traffic, changes to land use and visual amenity are expected to be relatively minor compared to other developments recently completed, under construction or proposed in the study area.

During construction, community concerns about impacts on road changes, loss of establish street trees and reduced local amenity from construction activities may be intensified when considered with impacts of other projects under construction or planned to be concurrently constructed in the study area. There may be particular concern about these effects extending over a number of years.

Operation

During operation, the proposal and adjoining road upgrades would have a positive cumulative impact on road safety and traffic flows within the area, by supporting nearby transport projects such as the M8

Motorway (Stage 1), M4-M5 Link, Sydney Gateway and the Alexandria to Moore Park project. This would allow for the anticipated increase in traffic volumes as a result of future population growth in the area. The proposal would also support urban renewal projects such as the Ashmore Precinct by providing safe pedestrian and bicycle access to recreational and sporting facilities (within Sydney Park), public transport (e.g. St Peters Station and bus stops along Sydney Park Road) and the King Street commercial precinct.

Landscaping improvements undertaken for the proposal and each of the projects mentioned above would have a positive cumulative impact on urban amenity within the area. Over the long term, the proposal and other developments being planned are expected to deliver social and economic benefits to the region through improvements in active transport connections, traffic flows, road safety, urban amenity and employment and business opportunities.

Operation of the proposal would result in a decrease in traffic noise levels along Princes Highway, King Street and Sydney Park Road and a minor increase (up to 0.5 dB) in traffic noise levels along Euston Road and Campbell Street/Campbell Road once the proposal is operational. The RNP notes that an increase of up to 2 dB represents a minor impact that is considered to be barely perceptible to the average person.

The likely cumulative impacts of the proposal, other projects and developments during construction and operation are summarised in Table 6-43.

Table 6-43 Potential cumulative impacts

Environmental factor	Construction	Operation
Traffic and transport	Since multiple other construction projects may be carried out near the proposal within a similar time period, there is potential for impacts on traffic and transport to be greater than those that were identified for the proposal in isolation. Impacts would primarily be a result of an increase in construction related traffic and road and lane closures. The potential cumulative impacts would include: • Increases in construction vehicle traffic causing noise/vibration and air quality impacts on sensitive receivers • Increased traffic volumes on alternative routes, resulting in congestion • Increased travelling time on the road network • Reduced traffic speeds on the road network • Extended construction zones.	The proposal would have a positive cumulative impact on road safety and help manage traffic flow in the region, together with other projects such as the M8 Motorway (Stage 1), the M4-M5 Link, Sydney Gateway and Alexandria to Moore Park Connectivity Upgrade.
Noise and vibration	There is potential for cumulative noise and vibration impacts during construction for sensitive receivers located in areas that overlap with construction of adjoining projects such as the M4-M5 Link, Sydney Gateway, Alexandria to Moore Park and other urban renewal projects such as the Ashmore Precinct.	Although the proposal would result in a decrease in noise levels along King Street, Princes Highway and Sydney Park during operation of the proposal, it would also result in a slight increase (up to 0.5 dB) in noise levels along Euston Road and Campbell Street/Campbell Road. The RNP notes that an increase of up to 2 dB represents a minor impact that is considered to be barely perceptible to the average person.

Environmental factor	Construction	Operation
Visual amenity and landscape character	Multiple construction activities could have a cumulative impact on visual amenity. Earthworks, construction compounds, stockpile sites, and construction machinery would be highly visible.	The Greater Sydney region is experiencing substantial changes in land use due to transport infrastructure upgrades and urban renewal initiatives. The proposal would remove a total of three mature planted trees. In the short term, there would be a visual amenity impact resulting from the cumulative loss of trees in the proposal area while the planted trees mature. Over the long term, the proposal would enhance the visual amenity of the proposal area through improved street layout, paving, lighting and additional street tree plantings and planted/turfed verge treatments.
Social impacts	Cumulative impacts would mainly be associated with changes to road conditions during construction across multiple projects resulting in temporary delays and disruptions, and subsequent impacts on people's access to employment, services and facilities, and movement of freight. Multiple construction activities over an extended period would likely result in 'construction fatigue' and amenity impacts (such as air quality, noise and visual) for local residents and businesses located near the construction areas. There would also be a cumulative impact on resource use, demand for construction materials and waste management.	Over the long term, the proposal and other developments being planned are expected to deliver social and economic benefits to the region through improvements in active transport connections, traffic flows, road safety, urban amenity and employment and business opportunities.

6.11.5 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Cumulative impacts from construction of multiple projects	Update the CEMP as required to address cumulative impacts as other projects/activities begin. This should include a process to review and update safeguards and management measures as new work begins or if complaints are received.	Contractor	Pre-construction/ Construction	Additional Safeguard C1
Cumulative traffic and access impacts	Prepare the Traffic Management Plan in consultation with Transport for NSW and the City of Sydney and Inner West councils.	Contractor	Pre-construction/ Construction	Additional Safeguard C2
Cumulative construction impacts	Include consultation with proponents of projects in the vicinity of the proposal in the Communication and Stakeholder Engagement Plan to: • Increase awareness of construction timeframes and impacts • Coordinate impact mitigation and management (e.g. respite periods).	Transport for NSW	Pre-construction/ Construction	Additional Safeguard C3

Other safeguards and management measures that would address cumulative impacts are presented in Sections 6.1 (Traffic and transport), Section 6.2 (Noise and vibration), Section 6.8 (Landscape character and visual impacts) and Section 6.9 (Socio-economic, land use and property).

7. Environmental management

This chapter describes how the proposal will be managed to reduce potential environmental impacts throughout detailed design, construction and operation. A framework for managing the potential impacts is provided. A summary of site-specific environmental safeguards is provided and the licence and/or approval requirements required prior to construction are also listed.

7.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in the REF in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these safeguards and management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Construction Environmental Management Plan (CEMP) will be prepared to describe the safeguards and management measures identified. The CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by the Transport for NSW Environment Officer, Greater Sydney Project Office, prior to the commencement of any on-site work. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in the QA Specification *G36 – Environmental Protection (Management System)*, QA Specification *G38 – Soil and Water Management (Soil and Water Plan)*, QA Specification *G10 – Traffic Management* and QA *Specification R179 – Landscape Planting.*

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures outlined in this REF will be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed work on the surrounding environment. The safeguards and management measures are summarised in Table 7-1.

Table 7-1 Summary of safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
General					
GEN1	General - minimise environmental impacts during construction	A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following: • any requirements associated with statutory approvals • details of how the project will implement the identified safeguards outlined in the REF • issue-specific environmental management plans • roles and responsibilities • communication requirements • induction and training requirements • procedures for monitoring and evaluating environmental performance, and for corrective action • reporting requirements and record-keeping • procedures for emergency and incident management • procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.	Contractor / Transport for NSW project manager	Pre-construction/detailed design	Core standard safeguard GEN1 Section 3.1 of QA *G36 Environment Protection*
GEN2	General - notification	All businesses, residential properties and other key stakeholders (e.g. schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.	Contractor / Transport for NSW project manager	Pre-construction	Additional standard safeguard GEN2

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
GEN3	General – environmental awareness	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular 'toolbox' style briefings. Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include: • areas of non-Aboriginal heritage sensitivity (including the St Peters Railway Station Group, the Former brickworks Group and adjacent areas of archaeological potential, the former tramways area of archaeological potential, Electricity Substation No. 549, Goodsell Estate Heritage Conservation Area, St Peters Hotel, King Street and Enmore Road Heritage Conservation Area, Former St Peters Theatre Façade, King Street Heritage Conservation Area and Sydney Park AIDS Memorial Groves) and heritage management including unexpected finds • potential contamination (including acid sulfate soils, potential AEI's identified in this REF) • adjoining residential areas requiring particular noise and vibration management measures • adjoining structures and buildings, including heritage structures and buildings, requiring vibration management measures • dust and air quality management	Contractor / Transport for NSW project manager	Pre-construction/detailed design	Core standard safeguard GEN3 Section 3.5 of QA *G36 Environment Protection*
GEN4	Utilities	Prior to the commencement of works: • The location of existing utilities and relocation details will be confirmed following consultation with the affected utility owners • If the scope or location of proposed utility relocation works falls outside of the assessed proposal scope and footprint, further assessment will be carried out.	Contractor	Detailed Design / pre-construction	Additional standard safeguard U1

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
Traffic and transport					
TT1	Traffic and transport	Prepare and implement a Traffic Management Plan (TMP) in accordance with the Transport for NSW *Traffic Control at Work Sites Manual* (RTA, 2010) and *QA Specification G10 Traffic Management* (Transport for NSW, 2020) as part of the CEMP. The TMP should include: • Confirmation of haulage routes • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic Monitoring, review and amendment mechanisms.	Contractor	Detailed design / Pre-construction	Core standard safeguard TT1 Section 2.2 of QA *G10 Traffic Management*
TT2	Local community notification	Undertake consultation with potentially affected residences prior to the commencement of and during works in accordance with the Transport for NSW's Community Involvement and Communications Resource Manual. Consultation should include but not be limited to door knocks, newsletters or letter box drops providing information on the proposal, working hours and a contact name and number for more information or to register complaints.	Transport for NSW	Pre-construction/construction	Core standard safeguard TT2 Section 2.2 of QA *G10 Traffic Management*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
TT3	Access	Maintain access to properties during construction. Where that is not possible or necessary, provide temporary alternative access arrangements in consultation with affected landowners and the relevant local road authority.	Contractor	Pre-construction/construction	Additional standard safeguard TT3
TT4	Impacts to pedestrians and cyclists	Maintain pedestrian and cyclist access throughout construction. Where that is not possible or necessary, provide temporary alternative access arrangements in consultation with affected landowners and the local road authority.	Contractor	Construction	Additional standard safeguard TT4
TT5	Community information	Provide road users and local communities with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.	Contractor	Construction	Additional standard safeguard TT5
TT6	Public transport network changes during construction	Maintain access for public transport services. Consult with bus operators, Transport for NSW, the City of Sydney Council and Inner West Council (as relevant), and inform the community of any temporary changes to bus stop operation.	Contractor	Construction	Additional standard safeguard TT6
TT7	General traffic and freight performance during construction	Undertake ongoing consultation with Transport Coordination, City of Sydney Council, Inner West Council, emergency services and bus operators to minimise transport and traffic impacts during construction.	Contractor	Construction	Additional standard safeguard TT7
TT8	General traffic and freight performance during construction	Implement a variable message sign strategy to encourage through and regional traffic to use Euston Road and Campbell Street / Campbell Road instead of Princes Highway and Sydney Park Road.	Contractor	Construction	Additional standard safeguard TT8
TT9	General traffic and freight performance during construction	Minimise construction vehicle movements during peak periods.	Contractor	Construction	Additional standard safeguard TT9
TT10	Safety around construction site accesses	Manage vehicle access to and from construction sites to ensure pedestrian, cyclist and driver safety. This may require manual supervision, physical barriers and / or temporary traffic control.	Contractor	Construction	Additional standard safeguard TT10
TT11	Construction personnel parking	Provide construction personnel parking at compound sites and not on local streets.	Contractor	Construction	Additional standard safeguard TT11

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
TT12	General traffic and freight performance during operation	Undertake an operational traffic review to confirm the operational traffic impacts of the proposal on the surrounding road network. This review would be undertaken as part of the ongoing post-opening operational traffic review that has been committed to as part of the WestConnex Stage 2 project.	Transport for NSW	Operation	Additional standard safeguard TT12
Noise and vibration					
NV1	Noise	Undertake further noise monitoring to confirm existing noise levels within the area of the proposal, to inform the Noise and Vibration Management Plan.	Transport for NSW	Detailed design	Additional safeguard NV1
NV2	Noise and vibration	A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the Interim *Construction Noise Guideline* (ICNG) (DECC, 2009) and identify: • all potential significant noise and vibration generating activities associated with the activity • feasible and reasonable safeguards and management measures to be implemented, taking into account *Beyond the Pavement: urban design policy, process and principles* (Roads and Maritime, 2014). • a monitoring program to assess performance against relevant noise and vibration criteria • arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Contractor	Detailed design/pre-construction	Core safeguard NV2 Section 4.6 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV3	Noise and vibration	All sensitive receivers (e.g. schools, local residents) likely to be affected would be notified at least five days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The notification would provide details of: • The project • The construction period and construction hours • Contact information for project management staff • Complaint and incident reporting • How to obtain further information.	Contractor	Detailed design/pre-construction	Additional safeguard NV3
NV4	Construction hours and scheduling	Where feasible and reasonable, construction will be carried out during the standard daytime working hours and work generating high noise levels will be scheduled during less sensitive time periods.	Contractor	Construction	Additional safeguard NV4
NV5	Construction respite period during normal hours and out of hours	The duration and respite of high noise generating activities will be carried out in accordance with the CNVG, and in consultation with the community. As a guide, high noise generating activities near receivers will be carried out in blocks that do not exceed three hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite will be flexible to accommodate the usage and amenity at nearby receivers.	Contractor	Detailed design/pre-construction/construction	Additional safeguard NV5
NV6	Plant noise levels	The noise levels of plant and equipment will have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix F of the CNVG. A noise monitoring audit program will be implemented to ensure equipment remains within the more stringent of the manufacturer's specifications or Appendix F of the CNVG. Only the necessary size and power of equipment will be used.	Contractor	Detailed design/pre-construction	Additional safeguard NV6
NV7	Equipment selection	Use quieter and less noise emitting construction methods where feasible and reasonable. Ensure plant, including the silencer, is well maintained.	Contractor	Detailed design/pre-construction	Additional safeguard NV7

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV8	Use and siting of plant	The offset distance between noisy plant and adjacent sensitive receivers will be maximised. Plant used intermittently will be throttled down or shut down. Noise-emitting plant will be directed away from sensitive receivers. Only have necessary equipment on site.	Contractor	Detailed design/pre-construction	Additional safeguard NV8
NV9	Plan work sites and activities to minimise noise	Locate compounds away from sensitive receivers and discourage access from local roads where possible. Parking and loading/unloading areas will be planned to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noisy activities will be scheduled for normal working hours. If the work cannot be undertaken during the day, it should be completed before 11:00pm where possible.	Contractor	Detailed design/pre-construction	Additional safeguard NV9
NV10	Non-tonal and ambient sensitive reversing alarms	Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site and for out of hours work. The use of ambient sensitive alarms that adjust output relative to the ambient noise level will be considered.	Contractor	Detailed design/pre-construction	Additional safeguard NV10
NV11	Additional noise mitigation measures	Where the NML at a receiver is exceeded after the standard mitigation measures listed in Appendix B of the Noise and Vibration Assessment (Appendix D) have been implemented, additional noise mitigation measures as per Appendix C of the CNVG will be considered.	Contractor	Detailed design/pre-construction	Additional safeguard NV11

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV12	Vibration	Dilapidation surveys should be conducted at all residential and other sensitive receivers (including heritage buildings) identified to be impacted by vibration from the construction site to identify any existing damage and damage due to the construction works.	Contractor	Pre-Construction	Core safeguard NV12 Section 4.7 of QA *G36 Environment Protection*
NV13	Construction vibration	Consider including the following measures into the CVMP to limit construction vibration levels: • Use lower vibration generating items of excavation plant and equipment where feasible • Suitably program the hours of operation of major vibration generating plant and equipment • Minimise consecutive work in the same locality • Use dampened rock breakers and/or “city” rock breakers • Undertake attended vibration monitoring where vibration-intensive work is required to be undertaken within the safe working distances • Complete building condition surveys before and after vibration-intensive work to identify existing damage and any damage due to the works schedule and localised geotechnical conditions are known.	Contractor	Detailed design/pre-construction	Core safeguard NV13 Section 4.7 of QA *G36 Environment Protection*
Non-Aboriginal heritage					
NAH1	Non-Aboriginal heritage	Prepare and implement a Non-Aboriginal Heritage Management Plan (NAHMP) as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to non-Aboriginal heritage.	Contractor	Detailed design/pre-construction	Core safeguard NAH1 Section 4.10 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NAH2	St Peters Railway Station Group	Submit a Section 57 Exemption Notification to the Heritage Council of NSW for approval prior to construction for temporary construction activities within the curtilage of the SHR listed 'St Peters Railway Station Group'.	Transport for NSW	Detailed design/pre-construction	Additional standard safeguard NAH2
NAH3	Areas of archaeological potential associated with the Former Brickworks Group	• Apply for a Section 140 Excavation Permit prior to construction for any subsurface disturbances or excavations deeper than 200 millimetres within the footpath area of archaeological potential next to the Former Brickworks Group.	Contractor	Detailed design/pre-construction	Additional standard safeguard NAH3
NAH4	Areas of archaeological potential associated with the Former Brickworks Group	• For any subsurface disturbances or excavations deeper than 200 millimetres within the footpath area of archaeological potential, undertake archaeological monitoring by an appropriately qualified historical archaeologist in accordance with the Excavation Permit, under the supervision of an historical archaeologist who meets the NSW Heritage Council's Excavation Director criteria. • For any ground-disturbance works occurring within the roadway area of archaeological potential associated with the brickworks, ensure that an appropriately qualified historical archaeologist is on call in the advent that any unexpected historical archaeological sites or items are found. The *Transport for NSW Standard Management Procedure: Unexpected Heritage Items* (Roads and Maritime 2015) should be implemented if any relics are uncovered. • The archaeologist that will take undertake archaeological monitoring during the works should prepare a detailed research design and methodology in accordance with Archaeological Assessments: Archaeological Assessment Guidelines (NSW Heritage Office 1996) to support the proposed safeguards and management measures for archaeological investigation. During works, they will monitor, investigate and record all archaeological features and deposits.	Contractor	Construction	Additional standard safeguard NAH4

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NAH5	Tramways area of archaeological potential	• For any works within the tramways area of archaeological potential, undertake archaeological monitoring by an appropriately qualified historical archaeologist, under the supervision of an historical archaeologist who meets the NSW Heritage Council's Excavation Director criteria. • Non-Aboriginal heritage Further, if sandstone kerb and gutters are impacted within the proposal area during construction, they must be properly recorded and reinstated to the original condition post construction. Contractor Construction Additional safeguard NA11.	Contractor	Construction	Additional standard safeguard NAH5
NAH6	Non-Aboriginal heritage	Follow the *Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) in during construction in the event that any unexpected heritage items, archaeological remains, human remains or potential relics of Non-Aboriginal origin are encountered. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design/pre-construction	Core safeguard NAH6 Section 4.10 of QA *G36 Environment Protection*
NAH7	Site induction	Train all personnel working on site to ensure they are aware of the requirements of the NAHMP and relevant statutory responsibilities. Provide site-specific training to personnel when working in the vicinity of identified non-Aboriginal heritage items.	Contractor	Pre-construction	Additional safeguard NAH7
NAH8	Non-Aboriginal heritage	Consult City of Sydney Council, Inner West Council and Ausgrid prior to construction to ensure any requirements about their heritage assets are identified and incorporated into the proposal.	Transport for NSW	Detailed design/pre-construction	Additional safeguard NAH8

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NAH9	Non-Aboriginal heritage	To prevent inadvertent impacts to significant heritage listed buildings and fabric during construction, implement temporary protection measures such as fencing, delineation of 'no-go' areas or placing visual bunting tape around the following heritage items: • Brick walls on either side of rail overbridge of St Peters Railway Station Group • Kilns and chimneys of the Former Brickworks Group • Electricity Substation No. 549 • Awnings and building of St Peters Hotel • Awnings and buildings of King Street and Enmore Road Heritage Conservation Area • Awnings and building of Former St Peters Theatre Façade • Awnings and buildings of King Street Heritage Conservation Area • Sydney Park AIDS Memorial Groves	Contractor	Pre-construction	Additional safeguard NAH9
NAH10	Non-Aboriginal heritage	Choose materials for signage, kerbs, and other road infrastructure that are compatible and complimentary to the surrounding heritage character of the study area. Landscaping elements along King Street and Sydney Park Road should be in keeping with the current industrial landscape of the area. They should not block the following elements of Exceptional heritage significance of the Former Bedford Brickworks Group: • the views and vistas along King Street and Sydney Park Road • the views and vistas to and from Sydney Park.	Transport for NSW	Detailed design/pre-construction	Additional safeguard NAH10
NA11	Non-Aboriginal heritage	Further, if sandstone kerb and gutters are impacted within the proposal area during construction, they must be properly recorded and reinstated to the original condition post construction.	Contractor	Construction	Additional safeguard NA11

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
Aboriginal heritage					
AH1	Aboriginal heritage	*The Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport for NSW does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design/pre-construction	Core safeguard AH1 Section 4.9 of QA *G36 Environment Protection*
Contaminated land					
CL1	Contaminated land – moderate/high risk areas	For areas that have been identified as having a moderate or high contamination impact potential (within and adjacent to Sydney Park at the Service Station at 2 Princes Highway), undertake a further data review. If the additional data review confirms that contamination is likely to have a very low or low impact potential, manage these areas in accordance with the Soil and Water Management Plan. This would typically occur where there is minor, isolated contamination that can be readily remediated through standard construction practices such as excavation and off-site disposal.	Transport for NSW	Detailed design/Pre-construction	Additional safeguard CL1
CL2	Contaminated land	Where data from the additional review (CL1) is insufficient to understand the contamination impacts, undertake a Detailed Site Investigation (Stage 2 assessment) (DSI) in accordance with the NEPM (2013) and other EPA guidelines. The areas requiring Detailed Site Investigation would be confirmed by the additional data review (CL1).	Transport for NSW	Detailed design/Pre-construction	Additional safeguard CL2

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
CL3	Contaminated land	Develop a Contamination Management Plan (CMP) for the area of the construction footprint if data from the additional data review (CL1) or the Detailed Site Investigation (CL2) confirms a moderate to very high potential for contamination impacts. The CMP would detail the management works required to mitigate impacts from contamination throughout and following completion of construction. The CMP would be prepared in accordance with relevant NSW EPA guidelines and where applicable, detail management methodologies in accordance with Australian Standards and other relevant government guidelines and codes of practice. Management would be performed as an integrated component of construction and to a standard commensurate with the proposed end use of the land. The requirements for a CMP would be confirmed following the additional data review (CL1) and Detailed Site Investigation (CL2).	Transport for NSW	Detailed design/Pre-construction	Core standard safeguard CL3 Section 4.2 of QA *G36 Environment Protection*
CL4	Contaminated land	Further investigations for waste classification are recommended to obtain thorough data	Contractor	Detailed design/Pre-construction	Additional safeguard CL4

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
CL5	Contaminated land	The Contamination Management Plan (CMP) should be prepared in accordance with the *Guideline for the Management of Contamination* (Roads and Maritime, 2013) and implemented as part of the CEMP. The plan should include, but not be limited to: • Capture and management of any surface runoff contaminated by exposure to the contaminated land • Further investigations required to determine the extent, concentration and type of contamination, as identified in the Detailed Site Investigation (CL2) • Management of the remediation and subsequent validation of the contaminated land, including any certification required • Measures to ensure the safety of site personnel and local communities during construction Ongoing monitoring measures during construction.	Contractor	Detailed design/Pre-construction	Core standard safeguard CL5 Section 4.2 of QA *G36 Environment Protection*
CL6	Unexpected finds	If contaminated areas (not previously identified) are encountered during construction, implement appropriate control measures to manage the immediate risks of contamination. Cease all other work that may impact on the contaminated area until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport for NSW Environment Manager and/or EPA.	Contractor	Construction	Core standard safeguard CL6 Section 4.2 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
CL7	Accidental spills	Develop spill management measures in accordance with the *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines and include the measures in the Soil and Water Management Plan. Measures should include, but not be limited to: • Store chemicals and fuels within an impervious bunded area • Protect downstream drains prior to refuelling taking place • Ensure all operators and delivery drivers undertaking refuelling are trained in the site refuelling procedure • All refuelling of vehicles and equipment would be undertaken off site or within an impervious bunded area at the compound site at least 40 metres from drainage lines. Where this cannot occur, mobile fuel trucks should be equipped with a self-bunded tank, spill prevention equipment and spill kits • Requirement for an emergency spill kit to be kept on site at all times and be easily accessible and staff awareness and training in its use Removal of contaminated material (soils, water, clean up materials) offsite by a licensed contractor and disposed of at an appropriately licensed facility.	Contractor	Detailed design/Pre-construction	Core standard safeguard CL7 Section 4.3 of QA *G36 Environment Protection*
CL8	Removal of excavated material	Classify all waste material excavated and removed from the proposal area in accordance with the NSW *Waste Classification Guidelines* (EPA, 2004)	Contractor	Construction	Additional safeguard CL8

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
CL9	Acid Sulfate Soils	Prepare and implement an ASS Management Plan in accordance with the Roads and Maritime Services Guidelines for the Management of Acid Sulfate Materials (RTA, 2005) a nd the ASSMAC *Acid Sulfate Soils Manual* (Stone, Ahern & Blunden, 1998) as part of the CEMP for the following works within the eastern portion of Sydney Park Road: • any works which extend beyond one metre below the natural ground surface or that could lower the water table beyond one metre below the natural ground surface • any works which could lower the water table below one metre AHD on adjacent Class 3 areas.	Contractor	Pre-construction	Additional safeguard CL9
CL10	Remaining contamination during operation	Information about any areas where contamination remains after construction should be documented in an appropriate form and provided to the relevant council for potential inclusion into the OEMP. This would include areas where the potential for vapour and ground gas emissions remains.	Transport for NSW	Construction	Additional safeguard CL10
Flooding and hydrology					
GW1	Groundwater	Establish dewatering requirements and formulate groundwater protection measures (e.g. protect water quality, minimise aquifer extraction volumes, determine if a licence is required under the *Water Management Act 2000*) prior to construction. Obtain any dewatering or aquifer interference permits required if the construction groundwater dewatering volume exceeds three megalitres per year.	Contractor	Pre-construction	Additional safeguard GW1
GW2	Groundwater	Prepare a Groundwater Management Plan, which would include information on the groundwater levels, excavation dimensions, the treatment of potentially contaminated groundwater, as well as a Dewatering Sub-plan. The Dewatering Sub-plan would quantify the amount of dewatering required and the method of disposal of dewatered groundwater.	Contractor	Pre-construction	Additional safeguard GW2

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
GW3	Flooding	Ancillary facility sites should: • Include provision of appropriate site drainage requirements to convey overland flows around the sites • Be graded (or facilities erected)to a minimum ground level of 2.7m AHD, which includes an appropriate freeboard (0.5m).	Contractor	Construction	Additional safeguard GW3
Biodiversity					
B1	Protect native flora and fauna, minimise edge effects and avoid inadvertent impacts	Site-specific training will be given to personnel when working in the vicinity of areas of identified biodiversity value that are to be protected.	Contractor	Construction	Core standard safeguard B1 Section 4.8 of QA *G36 Environment Protection*
B2	Minimise risks to native flora and fauna during construction	Consult with an arborist to confirm the depth and extent of existing tree root systems in the vicinity of the works and to advise if the proposed works would cause any harm to the tree roots.	Contractor	Detailed design/pre-construction	Additional safeguard B2
B3	Minimise risks to native flora and fauna during construction	Protect trees nominated for retention in line with Australian Standard *AS 4970-2009 Protection of Trees on Development Sites* (Standards Australia, 2010). Exclusion zones will be established in area of construction and ancillary sites and identified in CEMP. Vehicle parking, machinery, construction compounds and material stockpiles will be located in cleared or disturbed areas.	Contractor	Construction	Additional safeguard B3

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B4	Fauna handling	Consistent with the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects*, and any specific requirements of the approved Flora and Fauna Management Plan, Implement management arrangements consistent with the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects*, will be implemented to ensure safe fauna handling. As a minimum that will include: • Fauna handling being carried out by appropriately licenced ecologists or wildlife carers • Liaison with local animal rescue agency, wildlife carer group or vet to establish agreed arrangements for fauna rescue or injured animal assistance Induction information for construction staff.	Contractor	Construction	Additional safeguard B4
B5	Minimise weed, pest species and pathogen risks	Manage Wweed, pest species and pathogen are to be managed in accordance with the *Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects*, and any specific requirements of the approved Flora and Fauna Management Plan, will be implemented to manage environmental risks associated with weeds, pest species and pathogens. As a minimum that will include: • Implementation of appropriate weed control methods and weed disposal Implementation of appropriate hygiene protocols where there are potential or known pathogen risks.	Contractor	Construction	Additional safeguard B5
Landscape character and visual impact					
L1	Existing trees	Keep tree removal to a minimum.	Contractor	Detailed design/pre-construction	Core standard safeguard L1 Section 3.3 of QA *Specification R179*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
L2	Tree planting	Proposed tree planting should reference the City of Sydney's Street Tree Masterplan and the Marrickville Street Tree Masterplan. City of Sydney's Street Tree Masterplan identifies the proposal site within the Southern Industrial precinct and proposes the planting of: • *Lophostemon confertus* (Brush Box) • *Banksia integrifolia* (Coast Banksia) • *Angophora costata* (Smooth Barked Apple) • *Corymbia maculata* (Spotted Gum) • *Platanus acerifolia* (London Plane) • *Robinia pseudocacia "Frisia"* (Golden Robinia) • *Backhousia citriodora* (Lemon Scented Myrtle) • *Fraxinus pennsylvanica* (Green Ash) • *Jacaranda mimosifolia* (Jacaranda) • *Melaleuca quinquenervia* (Broad Leaf Paperbark) • *Eucalyptus microcorys* (Tallowwood) • *Eucalyptus sideroxylon* (Red Ironbark) The Marrickville Street Tree Masterplan identifies the proposal site within the Sydenham & St Peters precinct and proposes the planting of *Lophostemon confertus* (Brush Box) along the Princes Highway between Belmore Street and Goodsell Street.	Contractor	Detailed design/pre-construction	Additional safeguard L2

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
Socio-economic, land use and property					
SE1	Community engagement	Prepare and implement a Communication and Stakeholder Engagement Plan (CSEP) in accordance with the *Community Involvement and Communications Resource Manual* (RTA, 2008)as part of the CEMP to help provide timely and accurate information to the community during construction. The CSEP should include (as a minimum): • Mechanisms to provide details, timing and likely impact of proposed activities to affected residents, businesses and the community, including changed traffic and access conditions and interruptions to utility services • Complaints handling procedure, including the contact name and number for complaints.	Contractor	Pre-construction	Core safeguard SE1 Section 3.7 of QA *G36 Environment Protection*
SE2	Community engagement	Notify local residents and potentially affected businesses before the work starts regarding the timing, duration and likely impact of construction activities., including interruptions to utility services.	Contractor	Pre-construction/Construction	Core safeguard SE2 Section 3.7 of QA *G36 Environment Protection*
SE3	Business impacts	Maintain pedestrian and vehicle access to businesses near to construction works for the duration of construction. Where temporary changes are required, these will be identified in consultation with the property owner and business owner.	Contractor	Construction	Additional safeguard SE3
Other impacts					
O1	Topography, geology and soils	Prepare and implement a Soil and Water Management Plan (SWMP) as part of the CEMP. The SWMP should identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction.	Contractor	Pre-construction	Additional safeguard O1 Section 2.1 of QA *G38 Soil and Water Management*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
O2	Topography, geology and soils	Prepare and implement a site-specific Erosion and Sediment Control Plan (ESCP) in accordance with the *'Blue Book' Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) as part of the SWMP. The ESCP should be updated throughout construction so it remains relevant to the activities. The ESCP measures should be implemented prior to commencement of works and maintained throughout construction.	Contractor	Pre-construction	Additional safeguard O2 Section 2.2 of QA *G38 Soil and Water Management*
O3	Topography, geology and soils	Prepare and implement spoil and fill management measures as part of the CEMP. The CEMP should identify the locations of spoil and fill stockpiles, sources of imported fill, and methods to re-use or dispose of excess or unsuitable spoil material including estimated volumes and disposal sites. Any excess soil or excavated material that cannot be used on site should be classified and managed in accordance with the EPA *Waste Classification Guidelines* (NSW EPA, 2014) and disposed of at an appropriately licensed waste facility.	Contractor	Pre-construction	Additional safeguard O3
O4	Air quality	Prepare and implement an Air Quality Management Plan (AQMP) as part of the CEMP. The AQMP should include, but not be limited to: • a map identifying locations of sensitive receivers • identification of potential risks/impacts due to work/activities • mitigation and suppression measures to be implemented, including a progressive rehabilitation strategy for exposed surfaces. • methods to manage work during strong winds or other adverse weather conditions a process for altering management measures as required	Contractor	Detailed design / pre-construction	Core standard safeguard O4 Section 4.2 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
O5	Waste and resource use	Prepare and implement a Waste Management Plan (WMP) as part of the CEMP. The WMP should include, but not be limited to: • measures to avoid and minimise waste associated with the project • classification of wastes and management options (re-use, recycle, stockpile, disposal) • statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions • procedures for storage, transport and disposal • monitoring, record keeping and reporting. The WMP should be prepared taking into account the *Environmental Procedure - Management of Wastes on Roads and Maritime Services Land* (Roads and Maritime Services, 2014b) and Transport for NSW Waste Fact Sheets.	Contractor	Detailed design / pre-construction	Core standard safeguard O5 Section 4.2 of QA *G36 Environment Protection*
O6	Existing condition of ancillary sites	Undertake a pre-construction land assessment prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) to identify the presence of any pre-existing wastes or stored materials. The assessment should be prepared in accordance with the Transport for NSW *Management of road construction and maintenance wastes* (Roads and Maritime Services, 2016).	Contractor	Pre-construction	Core standard safeguard O6 Section 4.15 of QA *G36 Environment Protection*
O7	Waste and resource use	Sample and manage waste materials (such as soils and aggregates) generated during the construction of the proposal that would be exported for use on another construction site or project in accordance with relevant resource recovery orders and exemptions as issued by the NSW EPA.	Contractor	Construction	Core standard safeguard O7 Section 4.11 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
O8	Utilities	Prior to the commencement of work: • Confirm the location of existing utilities and relocation details in consultation with the affected utility owners Undertake further assessment if the scope or location of proposed utility relocation work falls outside the assessed proposal scope and footprint	Contractor	Detailed design / pre-construction	Additional safeguard O8
O9	Hazards and risk management	Prepare and implement a Hazard and Risk Management Plan (HRMP) as part of the CEMP in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice, and EPA or NSW Department of Planning, Industry and Environment (DPIE) publications. The HRMP should include, but not be limited to: • Details of hazards and risks associated with the activity • Measures to be implemented during construction to minimise these risks • Record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • A monitoring program to assess performance in managing the identified risks • Contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations.	Contractor	Detailed design / pre-construction	Additional safeguard O9
O10	Hazards and risk management	Manage health and safety risks during construction by implementing standard workplace health and safety requirements. Manage construction sites in accordance with the requirements of the Safe Work Australia, the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011*.	Contractor	Construction	Additional safeguard O10

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
Cumulative impacts					
C1	Cumulative impacts from construction of multiple projects	Update the CEMP as required to address cumulative impacts as other projects/activities begin. This should include a process to review and update safeguards and management measures as new work begins or if complaints are received.	Contractor	Pre-construction/ Construction	Additional Safeguard C1
C2	Cumulative traffic and access impacts	Prepare the Traffic Management Plan in consultation with Transport for NSW and the City of Sydney and Inner West councils.	Contractor	Pre-construction/ Construction	Additional Safeguard C2
C3	Cumulative construction impacts	Include consultation with proponents of projects in the vicinity of the proposal in the Communication and Stakeholder Engagement Plan to: • Increase awareness of construction timeframes and impacts Coordinate impact mitigation and management (e.g. respite periods).	Transport for NSW	Pre-construction/ Construction	Additional Safeguard C3

7.3 Licensing and approvals

Before the proposal can proceed, additional licences and/or approvals would be required to be obtained from the relevant authorities, as listed in Table 7-2 below.

Table 7-2 Summary of licensing and approvals required

Instrument	Requirement	Timing
Roads Act 1993 (Section 138)	A road occupancy licence (ROL) would need to be obtained to dig up, erect a structure or carry out work in, on or over a road.	Prior to start of the activity.
Heritage Act 1977 (Section 57)	As the proposal would involve temporary construction activities within the curtilage of the SHR listed 'St Peters Station Railway Group', a Section 57 Exemption Notification would be submitted to, and approved by, the Heritage Council of NSW prior to construction of the proposal commencing.	Prior to start of the activity.
Heritage Act 1977 (Section 140)	For any subsurface disturbances or excavations deeper than 200 millimetres within the footpath area of archaeological potential next to the Former Brickworks Group, a Section140 Excavation Permit would be obtained from the Heritage Council of NSW.	Prior to start of the activity.

8. Conclusion

This chapter provides the justification for the proposal taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

8.1 Justification

The proposal is needed to improve pedestrian and cyclist access, intersection performance and road safety along the road corridor where the proposal is located. The proposal would also support nearby urban renewal and transport projects by improving urban amenity and managing traffic flows within the locality.

The proposal responds to the NSW Government's vision to create a well-connected Greater Sydney with centres that are connected by safe and convenient walking and cycling routes. The focus of the proposal is to improve pedestrian and cyclist access and road safety along the proposal and interface with other transport projects nearby such as the M8 Motorway (Stage 1) and the Alexandria to Moore Park projects. The proposal would also support local urban renewal initiatives in the area such as the Ashmore Precinct and St Peters Triangle developments by improving urban amenity and pedestrian and cyclist along the King Street/Princes Highway and Sydney Park Road corridors.

The proposal, as described in this REF, best meets the proposal objectives. However, it would still result in some potential impacts during construction and operation including construction noise and vibration, changes to access and traffic delays during construction, visual and landscape changes, loss of street parking and established street trees and heritage impacts. These impacts would be managed and minimised by safeguards and management measures during construction and operation of the proposal.

8.1.1 Social factors

The proposal would have some negative social impacts as a result of the disturbance and change that would occur during construction. The combined effect of construction noise and vibration, dust, pedestrian diversions and general disturbance caused by construction activity, construction traffic and machinery movements would result in a general loss of amenity for residents, motorists, workers and others who live near the proposal area and those who visit the proposal area on a regular basis.

Communities in the study area have been subject to construction impacts from other transport and urban development projects in the study area, including the new skate park in Sydney Park, the M8 Motorway (Stage 1) and urban redevelopment, such as the multi-storey residential apartments along Princes Highway and the Ashmore Precinct.

Operation of the proposal decrease in on-street parking on Sydney Park Road and Princes Highway/King Street of approximately 15 car park spaces, and an increase in May Street of approximately 9 car park spaces. Local side streets have limited capacity to accommodate the loss of on-street parking. An assessment of the impacts on businesses due to the loss of on-street and off-street parking determined that overall, there is expected to be a moderate impact to businesses located along Princes Highway from proposed changes in parking conditions.

During operation, the proposal and adjoining road upgrades would have a positive cumulative impact on access within the study area by improving road safety, pedestrian and cyclist access and connectivity and by supporting nearby urban renewal and transport projects such as the Ashmore Precinct and the M8 Motorway (Stage 1). The proposal would also reduce traffic volumes in the King Street./Princes Highway and Sydney Park Road corridors, which would result in an associated improvement in air quality and a reduction in noise levels in the locality.

8.1.2 Biophysical factors

The proposal involves narrowing the existing main road corridor. The proposal would therefore minimise the amount of land required for its development and the consequential impact on adjoining land uses, watercourses and ecosystems. The proposal would generally follow the existing topography and would thereby minimise the need for earthworks.

The proposal would remove three planted mature native trees. These trees (small-leaved fig trees (*Ficus obliqua*)) are considered to provide potential foraging habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Superb Fruit-Dove (*Ptilinopus superbus*), Little Lorikeet (*Glossopsitta pusilla*) and the Powerful Owl (*Ninox strenua*).

Assessments of Significance (refer to Appendix I) have been carried out for threatened species impacted by the proposal and found that the proposal is unlikely to have a significant impact.

The proposal would replace cleared trees with a much larger number (over 50) of new trees and landscaping which is expected to improve the habitat value of the area significantly over the long term.

The proposal would require excavation, removal of vegetation, disturbance of soils and the construction of road surfaces and drains, which may lead to exposed soils, sediment entering waterways and the degradation of water quality. These potential impacts would be minimised through the implementation of standard sediment and erosion control measures.

A Stage 1 contamination assessment was completed for the proposal. The investigation identified 10 potential AEIs within or in near to the proposal area that may present a low to high contamination risk to the proposed construction activities. The Stage 1 contamination assessment recommended that a further data review be undertaken for areas with a medium to high contamination risk prior to construction. Where data from the additional review is insufficient to understand the contamination impacts, a Detailed Site Investigation (Stage 2 contamination assessment) would be undertaken to understand the nature and extent of potential contamination on site.

Any potential short-term negative biophysical impacts of the proposal would be managed by safeguards and management measures proposed in Section 7.2 and would be outweighed by the long-term benefits of the proposal.

8.1.3 Economic factors

The proposal would be constructed largely within the existing road corridor, with no land acquisition required. The upgrade of an existing road corridor would minimise long-term disruption and economic impacts on residents, businesses and motorists.

The proposal would deliver long-term economic benefits on its own and as part of a number of strategic plans for infrastructure investment in Sydney's CBD, including the *State Infrastructure Strategy 2018–2038* (Infrastructure NSW, 2018), the *Future Transport Strategy 2056* (Transport for NSW, 2018a), *Sustainable Sydney 2030 – Community Strategic Plan 2017-2021* (City of Sydney Council, 2016) and *City Plan 2036* (City of Sydney Council, 2019).

The proposal would improve safety for all road users through lane reconfiguration and traffic signal changes at intersections and by enhancing pedestrian and cycle facilities within the proposal area. The proposal would support local urban renewal initiatives planned in the area including such developments as Ashmore Precinct and the St Peters Triangle developments by improved urban amenity and pedestrian and cyclist infrastructure.

8.1.4 Public interest

The public interest is best served through the equitable distribution of resources, and investment in public infrastructure that fulfils the needs of the majority. The proposal represents a cost-efficient investment in public infrastructure that would maximise the long-term social and economic benefits, while minimising the long-term negative impacts on communities and the environment. By improving local transport infrastructure, the proposal would better enable the movement of people, goods and services.

The proposal would result in some short-term impacts on amenity, accessibility and transport efficiency during construction. These impacts have been minimised wherever possible through design and site-specific safeguards.

There are a number of State strategic plans that specifically refer to the significance of improving safety and access for pedestrians and cyclists in Greater Sydney. The proposal is consistent with these strategic plans including the *Greater Sydney Regional Plan*, *State Infrastructure Strategy 2018–2038, Future Transport Strategy 2056*, *Greater Sydney Services and Infrastructure Plan*, *Greater Sydney Green Grid* and the *Road Safety Plan 2021*, among others.

Consequently, the impacts of the proposal would be outweighed by the long-term benefits once the proposal is operational. As a result, the proposal is considered to be in the public interest.

8.2 Objects of the EP&A Act

The objects of the EP&A Act, and how these are addressed in the proposal, are presented in Table 8-1.

Table 8-1 How the proposal addresses the objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposal would improve the social and economic welfare of the community by improving road safety and pedestrian and cyclist access and enhancing urban amenity within the proposal area. The proposal would also reduce traffic volumes in the King Street/Princes Highway and Sydney Park Road corridors, which would result in an associated improvement in air quality and a reduction in noise levels in the locality. However, during construction, the community and businesses in the area would be likely to experience temporary traffic delays, noise, vibration, air quality and visual amenity impacts. The proposal would remove about three planted street trees that may have community value, but these trees would be replaced by a large number (over 50) of new trees. Operation of the proposal would result in an decrease in on-street parking on Sydney Park Road and Princes Highway/King Street of approximately 15 car park spaces, and an increase in May Street of approximately 9 car park spaces. The loss of on-street parking would result in a moderate impact to businesses located on Princes Highway. The proposal design, impact, safeguards and management measures detailed in this REF allow for the proper management, development and conservation of natural and artificial resources.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	Ecologically sustainable development is considered in Section 8.2.1 below. Section 6 of this REF has considered relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.
1.3(c) To promote the orderly and economic use and development of land.	The proposal would maximise the use of an existing road corridor and improve road safety for all road users along the corridor. The proposal has also considered anticipated growth within the area, including urban renewal initiatives within the study area such as the Ashmore Precinct and the St Peters Triangle developments, as well as other transport

Object	Comment
	projects, such as the M8 Motorway (Stage 1), St Peters interchange and the Alexandria to Moore Park road upgrades.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the proposal.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	The proposal would be located on land which has been heavily disturbed due to the construction of the existing road and other nearby development. The proposal would remove three planted mature street trees. These trees are native trees and could potentially provide foraging habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Superb Fruit-Dove (*Ptilinopus superbus*), Little Lorikeet (*Glossopsitta pusilla*) and the Powerful Owl (*Ninox strenua*). Assessments of Significance (refer to Appendix I) have been carried out for threatened species potentially impacted by the proposal and found that the proposal is unlikely to have a significant impact. The proposal would replace cleared trees with a large number (over 50) of new trees and landscaping which is expected to improve the habitat value of the area significantly over the long term.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	An assessment of impacts to Aboriginal heritage has been undertaken in accordance with the requirements of the PACHCI, refer to Section 6.4. The assessment concluded that the proposal would not impact any registered AHIMS sites. The proposal would only impact areas that have been assessed as having very low to low Aboriginal archaeological sensitivity, therefore impacts to Aboriginal objects are considered unlikely.
1.3(g) To promote good design and amenity of the built environment.	Urban design principles from *Beyond the Pavement 2020* have been incorporated into the design. Landscaping to be installed during the construction of the proposal would seek to be consistent with the surrounding areas. Proposed tree planting would be in accordance with the City of Sydney's Street Tree Masterplan and the Marrickville Street Tree Masterplan.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the proposal.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposal.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Consultation with Inner West Council and City of Sydney Council was carried out during the development of the proposal. Details of this consultation can be found in Section 5. There would be opportunities for the public to comment on the proposal during the exhibition of the REF.

8.2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the proposal.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are discussed below.

The precautionary principle

This principle states: "if there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation".

Evaluation and assessment of alternatives and options have aimed to reduce the risk of serious and irreversible impacts on the environment. Stakeholder consultation considered issues raised by stakeholders and a range of specialist studies were carried out for key issues to provide accurate and impartial information during the design development process.

The detailed design has sought to minimise impacts on the amenity of the proposal area while maintaining engineering feasibility and safety for all road users. A number of safeguards are proposed to minimise potential impacts. These safeguards would be implemented during construction and operation of the proposal. No safeguards have been postponed out of any lack of scientific certainty.

A CEMP would be prepared prior to construction starts to ensure the proposal achieves a high level of environmental performance. No safeguards and management measures would be postponed because of a lack of information.

Intergenerational equity

Intergenerational equity refers to the principle that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The proposal would not result in any impacts that are likely to adversely impact on the health, diversity or productivity of the environment for future generations.

The proposal would benefit future generations by improving road safety and air quality along King Street, Princes Highway and Sydney Park Road and encouraging the use of active modes of transport that would improve future generations' physical well-being and health.

Should the proposal not proceed, the principle of intergenerational equity may be compromised, as public safety may be affected by future traffic incidents within the King Street/Princes Highway and Sydney Park corridors. The local community may also be subject to increased noise levels and air quality impacts as traffic volumes increase along the road corridors.

It is acknowledged that the proposal may have some adverse impact on the current generation, generally through temporary construction impacts. However, these are not considered to be of a nature or extent that would disadvantage future generations.

Conservation of biological diversity and ecological integrity

This principle states: "the diversity of genes, species, populations and communities, as well as the ecosystems and habitats to which they belong, must be maintained and improved to ensure their survival".

An assessment of the existing local environment has been carried out to identify and manage any potential impact of the proposal on local biodiversity. The proposal is located in an area that has previously been modified or disturbed as a result of urban development.

The detailed design has been developed to minimise, wherever possible, direct impacts on biodiversity. Vegetation clearance has been minimised where possible. The proposal would remove about three planted mature street trees. These trees are native trees and are considered to provide potential foraging habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Superb Fruit-Dove (*Ptilinopus superbus*), Little Lorikeet (*Glossopsitta pusilla*) and the Powerful Owl (*Ninox strenua*). The Assessments of Significance (refer to Appendix I) carried out for

threatened species impacted by the proposal found that the proposal is unlikely to have a significant impact on these species. The proposal would replace the cleared trees with a large number (over 50) new trees and landscaping which is expected to improve the habitat value of the area significantly over the long term.

The proposal would not significantly fragment or isolate any existing large patches of vegetation and would not compromise biological diversity or ecological integrity. The landscape design was developed and implemented which reflected the structure and species of locally endemic flora to ensure that biological diversity in the local area is maintained.

Improved valuation, pricing and incentive mechanisms

This principle is defined as:

"Improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems."

Environmental and social issues were considered in the strategic planning and establishment of the need for the proposal, and in consideration of various proposal options. The value placed on environmental resources is evident in the extent of the planning and environmental investigations, and in the design of the proposed safeguards and management measures.

Implementation of these safeguards and management measures would result in an economic cost to Transport for NSW, which would be included in both the capital and maintenance cost of the proposal.

8.3 Conclusion

The proposed works to improve the southern 'gateway' to King Street at Newtown is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration (as relevant) of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the EPBC Act.

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal as described in the REF best meets the proposal objectives but would still result in some impacts during construction and operation including construction noise and vibration, changes to access and traffic delays during construction, visual and landscape changes and loss of street parking and established street trees with community value. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts.

The proposal would improve road safety and active transport infrastructure within the King Street/Princes Highway and Sydney Park corridors as well as support substantial nearby urban renewal and transport projects with better amenity and safety for customers. On balance the proposal is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposal is subject to assessment under Division 5.1 of the EP&A Act. Consent from Inner West Council and City of Sydney Council is not required.

Significance of impact under Australian legislation

The proposal is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of the Environment and Energy is not required.

9. Certification

This review of environmental factors provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal.

Damien Wagner

Principal Environmental Manager

Jacobs

Date: 14/07/2021

I have examined this review of environmental factors and accept it on behalf of Transport for NSW.

Panduka Manamperi

Acting Senior Project Manager

Transport for NSW

Date: 14/07/21

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Terms and acronyms used in this REF

<table>
<tr><th>Term/ Acronym</th><th>Description</th></tr>
<tr><td>ABS</td><td>Australian Bureau of Statistics</td></tr>
<tr><td>ACHAR</td><td>Aboriginal Cultural Heritage Assessment Report</td></tr>
<tr><td>AEI</td><td>Areas of Environmental Interest</td></tr>
<tr><td>AEP</td><td>Annual Exceedance Probability. The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. In this study AEP has been used consistently to define the probability of occurrence of flooding. It is to be noted that design rainfalls used in the estimation of design floods up to and including 100 year ARI (i.e. 1% AEP) events was derived from 1987 Australian Rainfall and Runoff (ARR).
The following relationships between AEP and ARI applies to this study (ARR, 2019):
<table>
<tr><th>Frequency Descriptor</th><th>EY</th><th>AEP (%)</th><th>AEP (1 in x)</th><th>ARI</th></tr>
<tr><td rowspan="5">Very frequent</td><td>12</td><td></td><td></td><td></td></tr>
<tr><td>6</td><td>99.75</td><td>1.002</td><td>0.17</td></tr>
<tr><td>4</td><td>98.17</td><td>1.02</td><td>0.25</td></tr>
<tr><td>3</td><td>95.02</td><td>1.05</td><td>0.33</td></tr>
<tr><td>2</td><td>86.47</td><td>1.16</td><td>0.50</td></tr>
<tr><td rowspan="5">Frequent</td><td>1</td><td>63.2</td><td>1.58</td><td>1.00</td></tr>
<tr><td>0.69</td><td>50.00</td><td>2</td><td>1.44</td></tr>
<tr><td>0.5</td><td>39.35</td><td>2.54</td><td>2.00</td></tr>
<tr><td>0.22</td><td>20.00</td><td>5</td><td>4.48</td></tr>
<tr><td>0.2</td><td>18.13</td><td>5.52</td><td>5.00</td></tr>
<tr><td rowspan="3">Infrequent</td><td>0.11</td><td>10.00</td><td>10.00</td><td>9.49</td></tr>
<tr><td>0.05</td><td>5.00</td><td>20</td><td>20.0</td></tr>
<tr><td>0.02</td><td>2.00</td><td>50</td><td>50.0</td></tr>
<tr><td rowspan="4">Rare</td><td>0.01</td><td>1.00</td><td>100</td><td>100</td></tr>
<tr><td>0.005</td><td>0.50</td><td>200</td><td>200</td></tr>
<tr><td>0.002</td><td>0.20</td><td>500</td><td>500</td></tr>
<tr><td>0.001</td><td>0.10</td><td>1000</td><td>1000</td></tr>
<tr><td rowspan="5">Extremely Rare</td><td>0.0005</td><td>0.05</td><td>2000</td><td>2000</td></tr>
<tr><td>0.0002</td><td>0.02</td><td>5000</td><td>5000</td></tr>
<tr><td></td><td></td><td rowspan="4">↓</td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Extreme</td><td></td><td></td><td>PMP</td><td></td></tr>
</table>
</td></tr>
<tr><td>AHD</td><td>Australian Height Datum</td></tr>
<tr><td>AHIMS</td><td>Aboriginal Heritage Information Management system</td></tr>
<tr><td>AHIP</td><td>Aboriginal heritage impact permit</td></tr>
</table>

Term/ Acronym	Description
Alignment	The vertical and horizontal location of the road
ANZECC	Australian and New Zealand Environment and Conservation Council
AQMP	Air Quality Management Plan
ASRIS	Australian Soil Resource Information System
ASS	Acid sulfate soils
ASSMAC	Acid Sulfate Soil Management Advisory Committee
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BTEX	Benzene, toluene, ethylbenzene and xylene
Capacity	Maximum number of vehicles which has a reasonable expectation of passing over a given section of a lane or a road in one direction during a given time period under prevailing road and traffic conditions.
CBD	Central business district
CCTV	Closed Circuit Television
CEMP	Construction environmental management plan
Clearway	A kerbside lane in which vehicles may only stop at certain times of the day.
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CMP	Conservation Management Plan
CM SEPP	State Environmental Planning Policy (Coastal Management) 2018
CSEP	Communication and Stakeholder Engagement Plan
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment
DSI	Detailed Site Investigation
DUAP	Department of Urban Affairs and Planning
EIA	Environmental impact assessment
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)Provides the legislative framework for land use planning and development assessment in NSW
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
HRMP	Hazard and Risk Management Plan
ICNG	Interim Construction Noise Guideline
ISEPP	State Environmental Planning Policy (Infrastructure) 2007

Term/ Acronym	Description
ITS	Intelligent Transport Systems
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LGA	Local Government Area
LHD	Local Heath District
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
L_{eq}	Equivalent sound pressure level – the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring. The sound weighting of the noise measurement is commonly added, for example LA_{eq} or LC_{eq}.
mbgl	Metres below ground level
MNES	Matters of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
NAHMP	Non-Aboriginal Heritage Management Plan
NEPM	National Environment Protection Measure
NHL	National Heritage List
NML	Noise Management Level
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
OEMP	Operational environmental management plan
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PFAS	Per- and poly-fluoroalkyl substances
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
POM	Plan of Management
RAP	Remedial Action Plan
PMF	Probable Maximum Flood
REF	Review of Environmental Factors
ROL	Road Occupancy Licence
SAR	Site Audit Report
SAS	Site Audit Statement
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SES	State Emergency Service
SHR	State Heritage Register
SOHI	Statement of Heritage Impact
SWMP	Soil and Water Management Plan
TMP	Traffic Management Plan
TRH	Total Recoverable Hydrocarbons

Term/ Acronym	Description
VOC	Volatile Organic Compounds
VMS	Variable Message Sign
WMP	Waste Management Plan
WSUD	Water Sensitive Urban Design

Appendix A

Consideration of clause 228(2) factors and matters of national environmental significance and Commonwealth land

Clause 228(2) Checklist

In addition to the requirements of the *Is an EIS required?* guideline (DUAP, 1995/1996) and the *Roads and Related Facilities EIS Guideline* (DUAP, 1996) as detailed in the REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposal on the natural and built environment.

Factor	Impact
a) Any environmental impact on a community?	
The proposal involves some impact on a community during construction including noise and vibration impacts, generation of airborne dust, temporary changes to traffic and access, and visual amenity and landscape impacts.	Short term, minor negative
Although the proposal would result in an approximately 40 metre increase in on-street parking space along Sydney Park Road, it would also result in a loss of approximately 105 metres of on-street parking space along Princes Highway, which would have a moderate impact on businesses located along Princes Highway.	
Overall, the proposal would significantly improve road safety, urban amenity and air quality along the road corridor. Section 6 of this REF describes the likely temporary and permanent impacts of the proposal, and lists recommended measures to mitigate impacts during construction and operation. The CEMP would incorporate all of the proposed safeguards for implementation throughout the proposal's construction phase.	Long term, positive
b) Any transformation of a locality?	
The proposal area currently consists of developed urban arterial roads carrying high volumes of traffic. The proposal area would undergo temporary transformation during construction due to removal of about three planted street trees and earthworks required to widen the footpaths and narrow the road corridor. These impacts would be mitigated with the implementation of recommended safeguards and management measures identified in Section 6.	Short term, minor negative
The proposed changes will significantly improve the visual amenity of the King Street, Princes Highway and Sydney Park corridors by reducing the road width and widening the public domain with paving, planting and landscaping.	Long term, positive
c) Any environmental impact on the ecosystems of the locality?	
The proposal would result in the removal of about three planted street trees that provide potential foraging habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Superb Fruit-Dove (*Ptilinopus superbus*), Little Lorikeet (*Glossopsitta pusilla*) and the Powerful Owl (*Ninox strenua*). All of these species are listed as vulnerable under the BC Act and the Grey-headed Flying-fox is also listed as vulnerable under the EPBC Act. Assessments of Significance (refer to Appendix I) have been carried out for threatened species impacted by the proposal and found that the proposal is unlikely to have a significant impact.	Short term, minor negative
The proposal would replace cleared trees with a large number (over 50) new trees and landscaping which is expected to improve the habitat value of the area significantly over the long term.	Long term, positive

Factor	Impact
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	
There would be a minor reduction in the aesthetic and recreational qualities of the locality during construction due to the use and movement of equipment near sensitive receivers and Sydney Park and the introduction of traffic management controls and construction traffic in the locality. These impacts would be mitigated with the implementation of recommended safeguards and management measures identified in Section 6.	Short term, minor negative
Although traffic modelling indicates that the reduction in lane capacity would result in increased delays at intersections along Princes Highway/King Street and Sydney Park Road, the reorganisation of traffic along Euston Road and Campbell Street/Campbell Road, as well as the projected increased use of active and public transport and other behavioural changes, are expected to reduce these impacts. The proposal would decrease on-street parking on Sydney Park Road and Princes Highway/King Street of approximately 15 car park spaces, and an increase in May Street of approximately 9 car park spaces which would have a moderate impact on businesses along princess highway..	Long-term, minor negative
Traffic modelling indicates that traffic volumes on Princes Highway/King Street, Sydney Park Road and Mitchell Road would reduce once the proposal is operational. This would lead to an improvement in air quality due to the reduction in vehicle emissions in the locality.	

Factor	Impact
e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?	
During construction there may be temporary impacts to the aesthetic and social significance of Sydney Park due to noise, vibration and dust generation, traffic delays and the visual impact of construction activities along the northern and western borders of Sydney Park. These impacts would be mitigated with the implementation of recommended safeguards and management measures identified in Section 6.	Short term, minor negative
The construction of the proposal may result in the following potential impacts to heritage listed items: • Minor direct/indirect impacts to 'St Peters Railway Station Group', listed on the State Heritage Register, State Rail Authority S170 Register and the Marrickville LEP • Minor direct/indirect impacts to 'Electricity Substation No. 549', listed on the Ausgrid S170 Register and under the Marrickville LEP • Minor direct/indirect impacts to, 'Goodsell Estate Heritage Conservation Area', 'Former Brickworks Group', 'St Peters Hotel', 'King Street and Enmore Road Heritage Conservation Area', 'Former St Peters Theatre Façade' and the 'King Street Heritage Conservation Area' listed under the Sydney LEP and Marrickville LEP • Moderate direct impacts to the former tramways area of archaeological potential along Princes Highway, King Street and Sydney Park Road and the areas of archaeological potential associated with the 'Former Brickworks Group' (beneath the footpath and the adjacent roadway on King Street and Sydney Park Road)	Long-term, minor, negative
Potential minor impacts would reduce to negligible impacts and potential moderate impacts would reduce to minor impacts with the implementation of safeguards and management measures specified in Section 6.	
Transport for NSW would apply for a Section 57 Exemption from the Heritage Council of NSW prior to construction for temporary construction activities within the curtilage of the State heritage listed 'St Peters Railway Station Group'. A Section 140 Excavation Permit would also be obtained from the NSW Heritage Division for subsurface disturbances or excavations within the area of archaeological potential in the footpath next to the 'Former Brickworks Group'. Archaeological monitoring would be undertaken by an appropriately qualified historical archaeologist during ground disturbance works within areas of archaeological potential where there is a high likelihood of archaeological remains to be found.	
There are no known sites of Aboriginal significance recorded within the study area and the Stage 1 PACHCI assessment concluded that the proposal is unlikely to harm an Aboriginal object or place of cultural heritage significance.	

Factor	Impact
f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974)?* The proposal would result in the removal of about three planted street trees that provide potential foraging habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Superb Fruit-Dove (*Ptilinopus superbus*), Little Lorikeet (*Glossopsitta pusilla*) and the Powerful Owl (*Ninox strenua*). All of these species are listed as vulnerable under the BC Act and the Grey-headed Flying-fox is also listed as vulnerable under the EPBC Act. Assessments of Significance (refer to Appendix I) have been carried out for threatened species impacted by the proposal and found that the proposal is unlikely to have a significant impact. The proposal would replace cleared trees with a large number (over 50) new trees and landscaping which is expected to improve the habitat value of the area significantly over the long term.	Short term, minor negative Long term, positive
g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposal would result in the removal of about three planted street trees that provide potential foraging habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Superb Fruit-Dove (*Ptilinopus superbus*), Little Lorikeet (*Glossopsitta pusilla*) and the Powerful Owl (*Ninox strenua*). All of these species are listed as vulnerable under the BC Act and the Grey-headed Flying-fox is also listed as vulnerable under the EPBC Act. Assessments of Significance (refer to Appendix I) have been carried out for threatened species impacted by the proposal and found that the proposal is unlikely to have a significant impact. The proposal would replace cleared trees with a large number (over 50) new trees and landscaping which is expected to improve the habitat value of the area significantly over the long term.	Short term, minor negative Long term, positive
h) Any long-term effects on the environment? Long-term adverse impacts of the proposal on the environment include loss of on-street parking space and increased delays at intersections along the road corridors of the proposal. Long-term beneficial impacts of the proposal on the environment include improvements in road safety for all road users, fauna habitat, visual and urban amenity and air quality. The proposal would also result in a decrease in noise levels along King Street, Princes Highway and Sydney Park Road.	Long term, positive
i) Any degradation of the quality of the environment? The proposal would potentially result in short-term degradation of the environment as a result of temporary noise and vibration generation, water quality and visual impacts, dust emissions and traffic disruptions and delays during construction.	Short-term, minor, negative

Factor	Impact
j) Any risk to the safety of the environment?	
During construction, the proposal may require the transportation and storage of hazardous or contaminated materials in limited quantities. These materials would be managed in accordance with the safeguards and management measures proposed in this REF.	Short-term, minor, negative
There is also the potential for road safety to be affected as a result of changed traffic conditions. Traffic management safeguards listed in Section 6.2.3 would be implemented, including preparation of a traffic management plan, to address safety risks.	
There is the potential for contamination (soil, groundwater, hazardous vapours and gas) to remain on site after construction. Accumulation of hazardous ground gases or toxic vapours within below ground structures (e.g. service trenches and pit) during operation could lead to potential explosion and/or asphyxiation risks and exposure to contaminated soils or groundwater could have adverse impacts to human health and the environment. Information about any areas where contamination remains should be documented in an appropriate form after construction and provided to the relevant council for potential inclusion into the Operational Environmental Management Plan (OEMP). The OEMP would include a number of ongoing management requirements including (but not limited to) procedures for excavation works, inspections and audits.	Long term, negative
The proposal would improve safety for road users during operation through traffic signal and lane reconfiguration works and improved pedestrian/cyclist facilities.	Long term, positive
k) Any reduction in the range of beneficial uses of the environment?	
During construction, the proposal may affect amenity in Sydney Park due to noise, vibration and dust generation and the visual impact of construction activities along the northern and western borders of the park. These impacts would be mitigated with the implementation of recommended safeguards and management measures identified in Section 6.	Short-term, minor, negative
The proposal would not change the range of beneficial uses of the environment during operation.	Long term, nil

Factor	Impact
l) Any pollution of the environment?	
The proposal would result in short-term pollution impacts as a result of noise generation and air and dust emissions from machinery and construction vehicles. Water quality may be impacted during the proposal as a result of erosion and sedimentation and potential fuel or chemical spills. In addition, groundwater hydraulically down gradient of the proposal could be impacted by contamination (if present) mobilised during construction. Safeguards and management measures listed in Section 6 would be implemented to minimise these impacts.	Short-term, minor, negative
The predicted reduction in traffic volumes during operation of the proposal would reduce the concentration of air pollutants emitted by vehicle exhausts (such as CO, NO_2 and PM_{10}) in the air by approximately 40 – 60 per cent. Reduced traffic volumes would also lead to a reduction in noise levels along King Street, Princes Highway and Sydney Park Road.	Long term, positive
m) Any environmental problems associated with the disposal of waste?	
During construction, a number of waste streams would be produced by the proposal. Where possible, excavated materials would be used on site. Where this is not possible, waste would be classified to identify suitable recycling and safe disposal methods in accordance with Transport for NSW *Environmental Procedure – Management of Wastes on Roads and Maritime Services Land* and the requirements of the EPA *Waste Classification Guidelines*.	Short-term, minor, negative
During operation, waste generation is expected to be minimal and consistent with the current use.	Long term, neutral
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	
It is predicted that about 6 000 tonnes of imported fill would be required for construction of the proposal. It is unlikely this, or any other resources required for the proposal would be in short supply.	Nil
o) Any cumulative environmental effect with other existing or likely future activities?	
Temporary potential cumulative impacts may occur as a result of construction activities occurring simultaneously with other projects around the proposal, such as the Ashmore Precinct urban renewal project and other transport projects such as the M8 Motorway (Stage 1), M4-M5 Link Tunnels, Sydney Gateway and Alexandria to Moore Park upgrades. Cumulative impacts would relate to noise and vibration, traffic and access, visual amenity and air quality impacts. These impacts would be mitigated with the implementation of recommended safeguards and management measures identified in Section 6.	Short-term, negative
Over the long-term, the proposal would have a positive cumulative impact on road safety and traffic flows within the study area by supporting nearby urban renewal and transport projects such as the M8 Motorway (Stage 1).	Long-term, positive

Factor	Impact
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposal is not located within a coastal area and would not result in any impact on coastal processes and coastal hazards.	Nil

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on the Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of the Environment and Energy.

A referral is not required for proposed actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. Impacts on these matters are still assessed as part of the REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
a) Any impact on a World Heritage property?	Nil
b) Any impact on a National Heritage place?	Nil
c) Any impact on a wetland of international importance?	Nil
d) Any impact on a listed threatened species or communities? The proposal would result in the removal of about three planted street trees that provide potential foraging habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Superb Fruit-Dove (*Ptilinopus superbus*), Little Lorikeet (*Glossopsitta pusilla*) and the Powerful Owl (*Ninox strenua*). All of these species are listed as vulnerable under the BC Act and the Grey-headed Flying-fox is also listed as vulnerable under the EPBC Act. The proposal would replace cleared trees with a large number (over 50) of new trees and landscaping which is expected to improve the habitat value of the area significantly over the long term. The Assessments of Significance (refer to Appendix I) found that the proposal would not be likely to significantly impact threatened species. Refer to Section 6.7.	Short term, minor negative Long term, positive
e) Any impacts on listed migratory species?	Nil
f) Any impact on a Commonwealth marine area?	Nil
g) Does the proposal involve a nuclear action (including uranium mining)?	Nil
h) Additionally, any impact (direct or indirect) on the environment of Commonwealth land?	Nil

Appendix B

Statutory consultation checklists and IESP consultantation

Infrastructure SEPP

Certain development types

Development type	Description	Yes/No	If 'yes' consult with	ISEPP clause
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No		ISEPP cl. 95A
Bus Depots	Does the project propose a bus depot?	No, but the proposal involves the relocation of bus stops	City of Sydney Council and Inner West Council notified about the proposed relocations	ISEPP cl. 95A
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No		ISEPP cl. 95A

Development within the Coastal Zone

Issue	Description	Yes/No/NA	If 'yes' consult with	ISEPP clause
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No		ISEPP cl. 15A

Council related infrastructure or services

Issue	Potential impact	Yes/No	If 'yes' consult with	ISEPP clause
Stormwater	Is the work likely to have a *substantial* impact on the stormwater management services which are provided by council?	No		ISEPP cl.13(1)(a)
Traffic	Is the work likely to generate traffic to an extent that will *strain* the capacity of the existing road system in a local government area?	Yes	City of Sydney Council and Inner West Council	ISEPP cl.13(1)(b)
Sewerage system	Will the work involve connection to a council owned sewerage system? If so, will this connection have a *substantial* impact on the capacity of any part of the system?	No		ISEPP cl.13(1)(c)
Water usage	Would the work involve connection to a council owned water supply system? If so, would this require the use of a *substantial* volume of water?	No		ISEPP cl.13(1)(d)
Temporary structures	Would the work involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, would this cause more than a *minor* or *inconsequential* disruption to pedestrian or vehicular flow?	Yes	City of Sydney Council and Inner West Council	ISEPP cl.13(1)(e)
Road & footpath excavation	Would the work involve more than *minor* or *inconsequential* excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	City of Sydney Council and Inner West Council	ISEPP cl.13(1)(f)

Local heritage items

Issue	Potential impact	Yes/No	If 'yes' consult with	ISEPP clause
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the work? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than *minor* or *inconsequential?*	Yes	City of Sydney Council	ISEPP cl.14

Flood liable land

Issue	Potential impact	Yes/No	If 'yes' consult with	ISEPP clause
Flood liable land	Is the work located on flood liable land? If so, would the work change flood patterns to more than a *minor* extent?	No	City of Sydney Council	ISEPP cl.15
Flood liable land	Is the work located on flood liable land? (to any extent). If so, does the work comprise anything other than minor alterations or additions to, or the demolition of, a building, emergency work or routine maintenance	Yes	State Emergency Services Email: erm@ses.nsw.gov.au	ISEPP cl.15AA

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled *Floodplain Development Manual: the management of flood liable* land published by the New South Wales Government.

Public authorities other than councils

Issue	Potential impact	Yes/No	If 'yes' consult with	ISEPP clause
National parks and reserves	Is the work adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act*?*	No		ISEPP cl.16(2)(a)
National parks and reserves	Is the work on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No		ISEPP cl. 16(2)(b)
Aquatic reserves	Is the work adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014*?	No		ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Is the work in the Sydney Harbour Foreshore Area as defined by the *Place Management NSW Act 1998?*	No		ISEPP cl.16(2)(d)
Bush fire prone land	Is the work for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No		ISEPP cl.16(2)(f)
Artificial light	Would the work increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No		ISEPP cl.16(2)(g)

Issue	Potential impact	Yes/No	If 'yes' consult with	ISEPP clause
Defence communications buffer land	Is the work on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011.	No		ISEPP cl. 16(2)(h)
Mine subsidence land	Is the work on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	No		ISEPP cl. 16(2)(i)

5 May 2021

Reference number: A37333079
File number: fA10152295

General Manager

City of Sydney Council
Town Hall House
Level 2, 456 Kent Street
Sydney 2000

Dear Sir/Madam

Consultation regarding the proposed King Street Gateway project in St Peters, Newtown, Erskineville and Alexandria

Transport for NSW is proposing to undertake works for the King Street Gateway project.

Under the State Environmental Planning Policy (Infrastructure) 2007, Transport for NSW is required to consult with City of Sydney Council under clause 13 – 15, due to the potential impacts on council infrastructure, flood liable lands, and impacts on local heritage. The proposal:

- May involve temporary works, excavation and disruption to local roads (for which City of Sydney Council is the roads authority under the Roads Act 1993) that is not minor or inconsequential. Stormwater drainage along the southern side of Sydney Park Road would be installed as part of the proposal.
- May involve installation of a temporary structure on, or the enclosing of, a public place that is under City of Sydney Council management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential.
- May result in development on flood liable land that is susceptible to flooding.
- May have a minor impact on the Former Brickworks Group listed as a Local heritage item (I27), and a moderate impact on areas of archaeological potential associated with the brickworks.
- May have a minor impact on the Former St Peters Theatre Façade listed as a Local heritage item (I614).
- May have a minor impact on the King Street Conservation Area listed as a Local heritage Conservation Area (c47).

Transport for NSW
71-79 Pyrmont Bridge Road, Pyrmont NSW 2009 NSW
W roads-maritime.transport.nsw.gov.au | ABN 18 804 239 602

The following have been attached to this letter.

Attachment A –	Proposal description
Attachment B –	Proposal overview figures
Attachment C –	A draft copy of the Statement of Heritage Impact (SOHI) that has been prepared to determine the possible heritage impacts.

It would be appreciated if you could provide any comments about this proposal by 28 May 2021.

Transport for NSW would be pleased to provide further information if required. In this regard, I may be contacted on [redacted] or by email Panduka.MANAMPERI@transport.nsw.gov.au.

Yours faithfully

Panduka Manamperi
A/Senior Project Manager

Transport for NSW
71-79 Pyrmont Bridge Road, Pyrmont NSW 2009 NSW
W roads-maritime.transport.nsw.gov.au | ABN 18 804 239 602

Attachment A: Proposal description

The key features of the proposal include:

- Reducing the Princes Highway/King Street carriageway from six lanes to four lanes from Campbell Street to Sydney Park Road (two lanes in each direction)
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- A new 2-way on-road segregated cycleway along the northern side of Sydney Park Road
- A new 2-way on-road segregated cycleway on King Street northbound carriageway, between May Street and Sydney Park Road
- A new mid-block pedestrian shared crossing on Princes Highway at Short Street
- A new mid-block separated crossing (pedestrian and cyclists) on Princes Highway between May Street and Goodsell Street (this will provide a new entrance to Sydney Park)
- Traffic signal and lane configuration works:
    - New traffic signals with new pedestrian crossings at the Barwon Park Road and Princes Highway intersection
    - Removing traffic signals at the Princes Highway/King Street and May Street intersection and re-configuring May Street to left in and left out only movements
    - Relocating existing traffic signals at the Princes Highway / King Street intersection
    - At the Princes Highway and Sydney Park Road intersection, removing a left turn and right turn lane from the Sydney Park Road eastern approach, removing one through lane from the Sydney Park eastbound departure, removing one left slip lane from the King Street northern approach, removing one through lane on the King Street southbound approach and removing one through lane on the King Street northern and southern departures. Replacing existing signalised pedestrian crossings with shared crossings on all approaches and relocating existing traffic signals
    - At the Sydney Park Road and Mitchell Road intersection, removing the dedicated right turn from the Sydney Park Road eastern approach; removing the right turn restriction to Sydney Park car park from the western approach; adding a no right turn restriction for Mitchell Road (bus excepted) and the Sydney Park car park exit and installing a new signalised shared crossing on the Sydney Park Road western leg.

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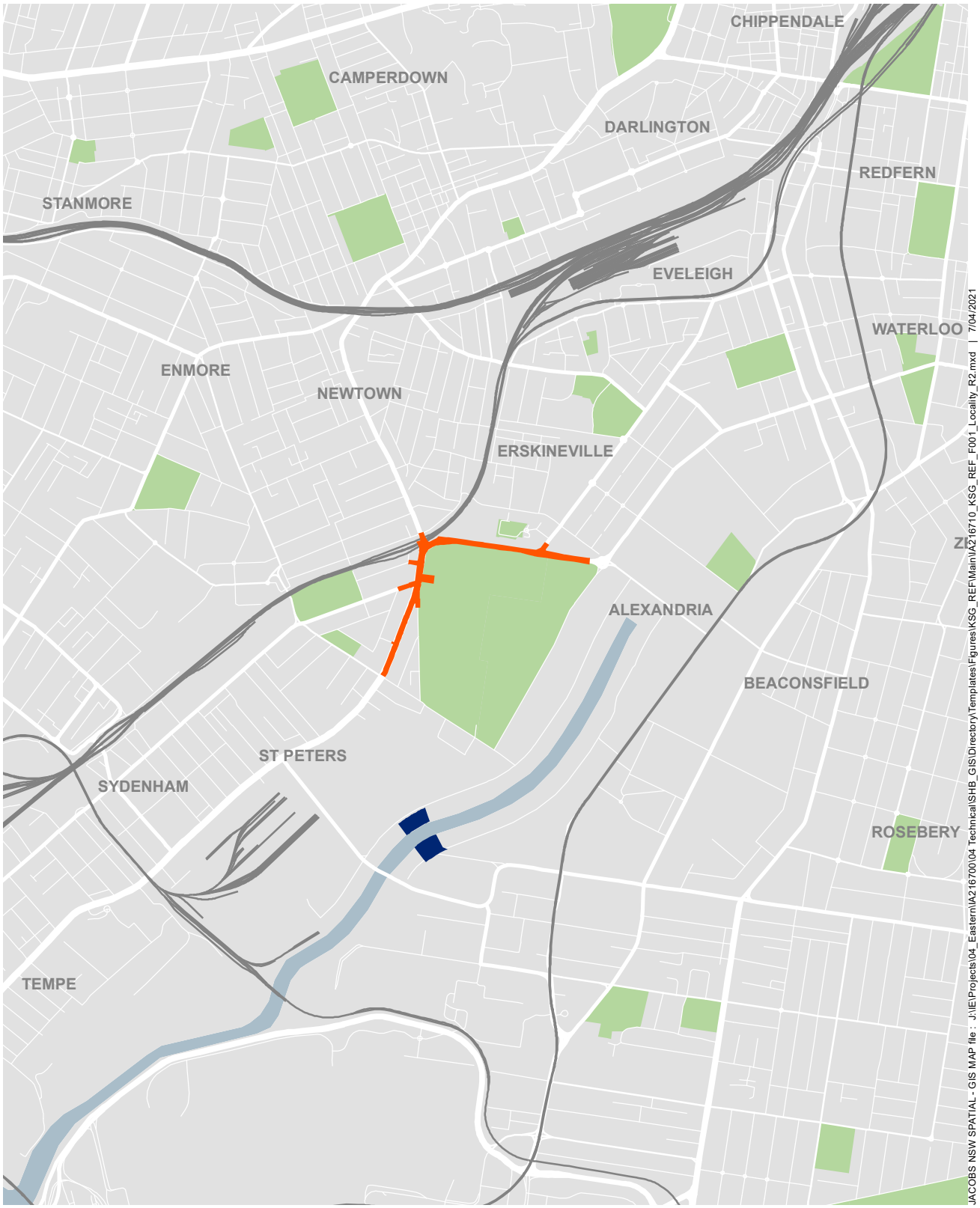
- New permanent parking on the southern side of Sydney Park Road
- Road re-surfacing at signalised intersections and along road corridor where required
- Kerb adjustments
- Removing the redundant bus stop in the westbound lane of Sydney Park Road, east of its intersection with Mitchell Road, and relocating the bus shelter to the existing bus stop to the west of the intersection
- Relocating utilities and adjustment of streetlights
- New landscaping along Princes Highway, King Street and Sydney Park Road
- Temporary construction facilities, including site compounds and ancillary facilities located at Burrows Road and Venice Street, Mascot located on Transport for NSW owned land.

Attachment B: Proposal overview figures



Legend

- Proposal area
- Compound locations
- Road
- Railway line

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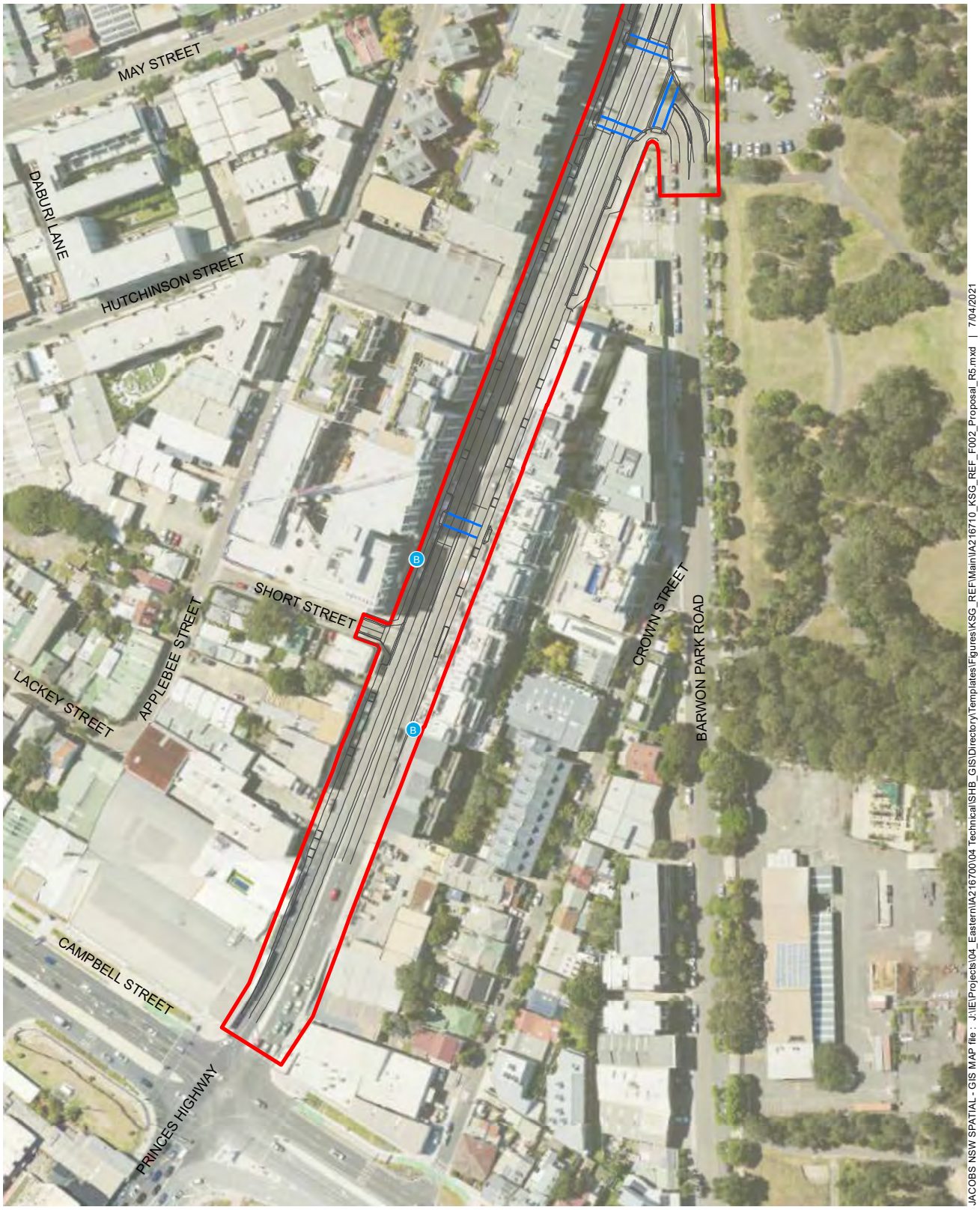
Figure 1-1 | The locality
Sydney Park Junction



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Legend

- Construction footprint
- Railway line
- Road
- Relocated bus stops
- Detail design
- Pedestrian/shared crossings
- Cycleway

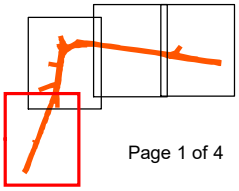

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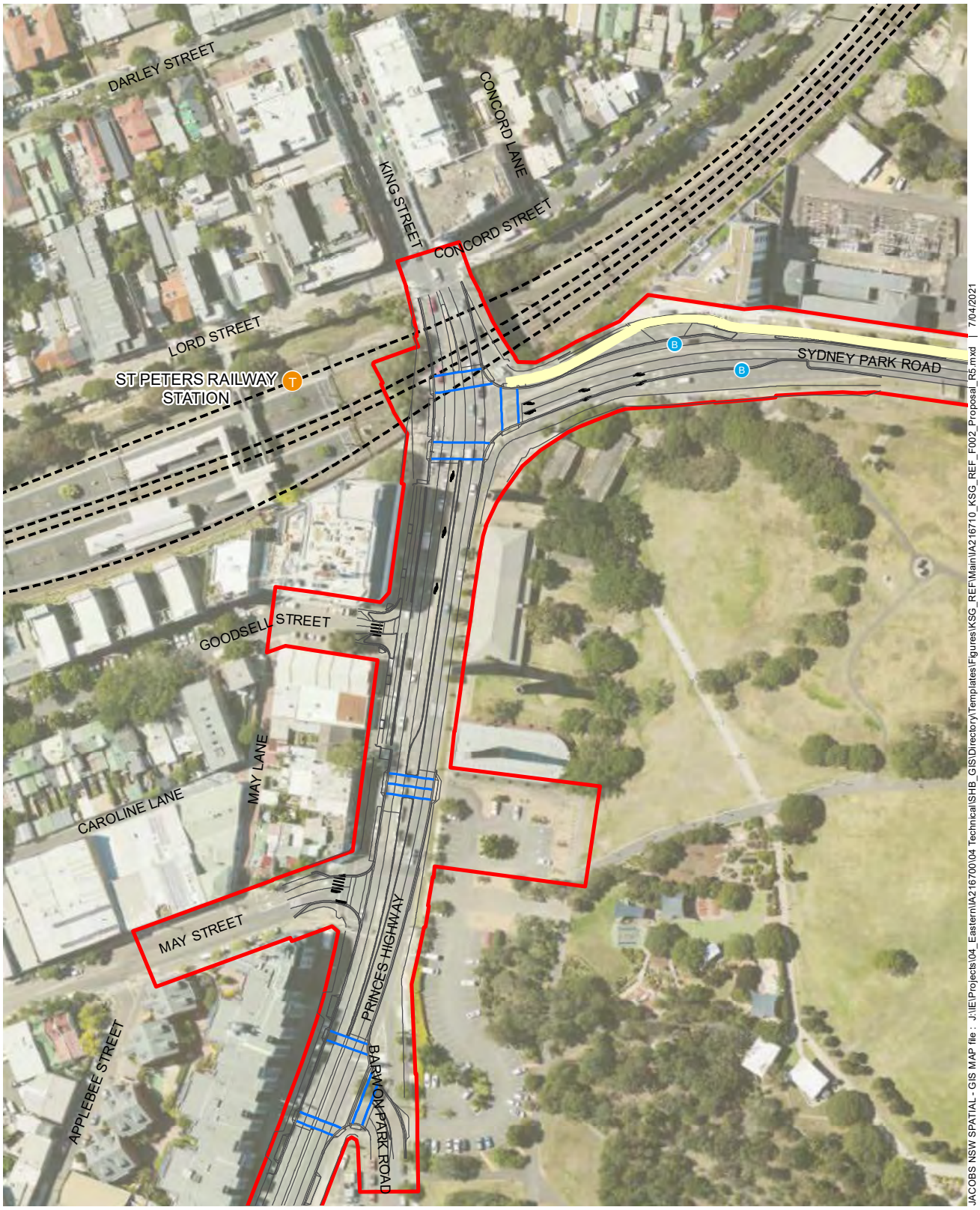
Figure 1-2 | The proposal

Sydney Park Junction



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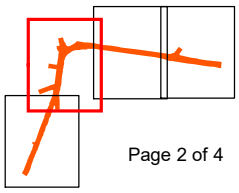

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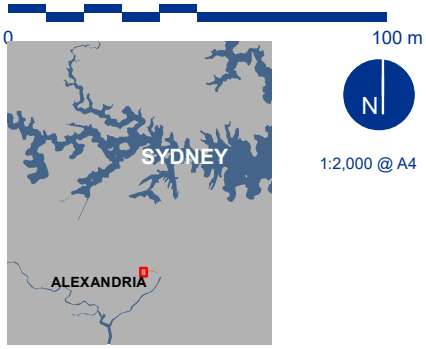

Figure 1-2 | The proposal

Sydney Park Junction

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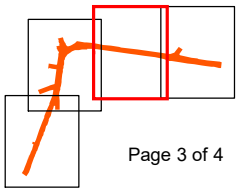

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Figure 1-2 | The proposal

Sydney Park Junction

Legend

- Construction footprint
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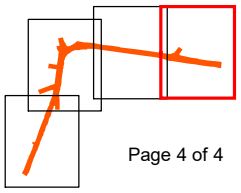

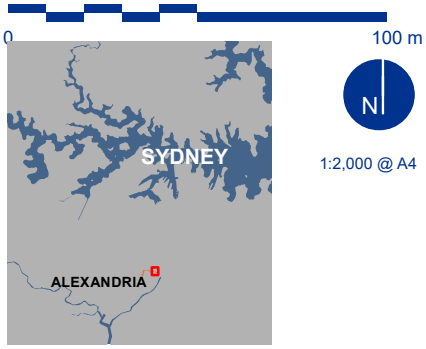

Figure 1-2 | The proposal
Sydney Park Junction

Wagner, Damien

From: Asad Rajbhoy <ARajbhoy@cityofsydney.nsw.gov.au>
Sent: Friday, 28 May 2021 10:23 AM
To: Wagner, Damien
Cc: Elise Webster; Panduka Manamperi
Subject: [EXTERNAL] RE: Transport for NSW King Street Gateway_ISEPP Letter Notification

Hi Damien,

We have reviewed the Review of Statement of Heritage Impacts for the King Street Gateway project and our comments are as follows:

There are ten separate heritage items intersecting with the study area and five of them are within City of Sydney LGA. Additionally, there are areas of archaeological potential in the study area including the former brickworks to the southeast of the intersection of King Street and Sydney Park Road (Bedford and Austral Brickworks), and two metres surrounding the extant subsurface tramways that formerly ran along King Street, Princes Highway, and Sydney Park Road.

Item	Address	Heritage ID
Former Brickworks Group	Sydney Park Road, St Peters	Sydney LEP, I27
Former St Peters Theatre Façade	672 King Street, Erskineville	Sydney LEP 2012, I614
King Street Heritage Conservation Area	North of Illawarra railway line, east of King Street	Sydney LEP 2012, C47
Sydney Park AIDS Memorial Groves	Barwon Park Road, St Peters	NHL 106068 - Nomination now ineligible for proposed priority assessment list (PPAL)
Alexandra Canal	Alexandria	SHR 01621

The proposal generally includes roadworks and footpath works for more cycle paths, pedestrian areas, public areas and additional landscaping. This would include some excavation resulting in potential archaeological disturbance and construction vibration impacts due to use of machinery in close vicinity of heritage items.

Review of assessment heritage impacts

Former Brickworks Group
There is potential impact on the Exceptional heritage significance view lines to and from the former Brickworks from the proposed landscaping. While the landscaping will occur outside the heritage item, the new landscaping has potential to obscure or obfuscate the views and vistas along King Street and Sydney Park Road and the views and vistas to and from Sydney Park. The landscaping elements along King Street and Sydney Park Road should be in keeping with the current industrial landscape of the area. They should not block the significant views and vistas of the former Brickworks.
There is potential visual impact from temporary construction facilities. This can be mitigated by using proposed fencing/hoarding to provide heritage interpretation.

Works are occurring within the carpark immediately adjacent to the Hoffman Patent Kiln. This heritage building is situated immediately adjacent to proposal area, and as such, may be subject to the risk of incidental impacts from the use of construction machinery and vehicles during the proposed works. The proposed detailed design should consider

the heritage kiln to avoid direct physical impacts. A dilapidation survey should be carried out to confirm the sensitivity of the item to vibration induced damage prior to commencing any works.

The two areas of archaeological potential associated with the brickworks are beneath the footpath and the adjacent roadway on King Street and Sydney Park Road, outside the LEP heritage boundary. Proposed works will occur within these areas of archaeological potential, including surface roadworks and landscape treatments. While the proposed works are not likely to require a great depth of sub-surface excavation there is still the potential for works to disturb archaeological remains. The report provides adequate measures in place for archaeological management; however, it is not clear what is proposed if the extant tram lines are encountered during excavation. It is therefore recommended that they should be adequately recorded and then left in the locations they were found to maintain these historic elements on site, with new road surfaces installed over them.

Former St Peters Theatre Façade
The proposal area is immediately adjacent to this heritage item. The footpath is situated between the heritage item, including the awning of the Former St Peters Theatre Façade, and the construction footprint. The awning of the Former St Peters Theatre Façade may be subject to the risk of incidental impacts from the use of construction machinery and vehicles during the proposed works. The proposed detailed design should consider the awnings to avoid direct physical impacts.
A dilapidation survey of the façade could be undertaken prior to commencement of excavation and construction works to ascertain the sensitivity of the façade.

King Street Heritage Conservation Area
The proposal has potential to physically impact the public features within the HCA that are of heritage significance, like footpath awnings, any significant lights and fixtures, historic light poles, drain covers, post boxes and street and laneway sandstone kerb and gutters. "String of Pearl" under awning pendant lighting should also be adequately protected and retained. The awnings associated with this heritage item should be specified as a risk in the Work Method Statements and during heritage induction training. I have made relevant recommendations below to adequately address the concerns above.
King Street HCA is also significant for not having any historic landscaping and to maintain that significance no landscaping within the area should be proposed as it would be contrary to the recommended management.

Sydney Park AIDS Memorial Groves
The proposal area intersects with the heritage item, at the northern pathway into the memorial groves. The footpath is immediately adjacent to this entry pathway. The closest grove of trees within the memorial are approximately 20 metres from the proposal area. As such, works situated along Barwon Park Road are unlikely to impact upon this heritage item.
However, any proposed landscaping in this context should take into consideration the existing landscaping of the grove and be sympathetic to it.

Alexandra Canal
Alexandra Canal is located adjacent to the temporary construction facilities at Venice Street, Mascot and Burrows Road, St Peters. No construction activities will be undertaken at these locations and use of these sites will be temporary. As such, no heritage impacts are likely to occur.

Potential archaeological items - tramway
The proposal area includes the subsurface remains of the former tram tracks and related infrastructure along Princes Highway, King Street and Sydney Park Road. As such, works occurring along the roadways may impact upon any remaining archaeological features of these two areas during excavation.

For works within the footpath area of archaeological potential with any subsurface disturbances or excavations deeper than 200 mm, archaeological monitoring would be undertaken in association with the Excavation Permit.

For works occurring within the roadway area of archaeological potential, archaeological monitoring is not required due to the greater potential depth of archaeological remains and the low likelihood of disturbance from the proposed works. Instead, an appropriately qualified historical archaeologist should be on call during any ground-disturbing works in the roadway area of archaeological in the advent that any unexpected historical archaeological sites are found.

It is likely that during excavation, the subsurface tramlines could be encountered, and it is unclear what the protocol is for if they are. Accordingly, I have made recommendations below.

The heritage impacts arising from the proposed works can be acceptable subject to following recommendations.

Recommendations:

1. **Dilapidation Survey**
   There is potential risk of vibration impacts to the Hoffman Patent Kiln and former St Peters Theatre Façade. The proposed detailed design should consider the heritage buildings to avoid direct impacts. A dilapidation survey should be undertaken prior to commencement of excavation and construction works.

2. **Archaeology**
   There is risk of impact to the potential archaeology of the former tramways and related infrastructure along Princes Highway, King Street and Sydney Park Road. It is unclear what happens in the event tramlines are discovered. It is recommended that they be left in the locations they were found.

3. **Protection of Public Features in Conservation Areas**
   The proposed work must take measures to protect existing street furniture and features on the public land including footpath awnings, any significant lights and fixtures, historic light poles, drain covers, post boxes and street and laneway sandstone kerb and gutters. If the sandstone kerb and gutter need to be interrupted during process of construction, they must be properly recorded and reinstated to the original condition.

4. **Sites in the vicinity of a heritage item**
   The proposed works are to ensure that St Peters Theatre Façade and the Hoffman Kiln are suitably protected during the construction process. The contractor or developer must conduct consultations with the stockholders of the neighbouring heritage site, record and monitor the conditions of the heritage building and take suitable measures to control and minimize any risks to the heritage fabric during construction. The protection measures should be incorporated into the construction management plan.

5. **Heritage induction training**
   Non-Aboriginal heritage awareness training must be provided for contractors prior to commencement of construction works to ensure understanding of potential heritage items that may be impacted during works, and the procedure required to be carried out in the event of discovery of historical heritage materials, features or deposits, or the discovery of human remains.

6. **Discovery of historical heritage materials, features or deposits**
   If at any time during works, historical heritage materials, features and/or deposits are found the Transport for NSW *Standard Management Procedure: Unexpected Heritage Items* (Roads and Maritime Services 2015) must be implemented.

7. **Discovery of human remains**
   In the event that works reveals possible human skeletal material (remains), the Transport for NSW *Standard Management Procedure: Unexpected Heritage Items* (Roads and Maritime Services 2015) must be implemented.

Please let me know if you need any clarification.

Regards,

Asad Rajbhoy
Traffic & Transport Planner Major Projects
City Access & Transport

CITY OF SYDNEY

5 May 2021

Reference number: A37333081
File number: fA10152295

General Manager

Inner West Council
PO Box 14,
Petersham NSW 2049

Dear Sir/Madam

Consultation regarding the proposed King Street Gateway project in St Peters, Newtown, Erskineville and Alexandria

Transport for NSW is proposing to undertake works for the King Street Gateway project.

Under the State Environmental Planning Policy (Infrastructure) 2007, Transport for NSW is required to consult with Inner West Council under clause 13 – 15, due to the potential impacts on council infrastructure, flood liable lands, and impacts on local heritage. The proposal:

- May involve temporary works, excavation and disruption to local roads (for which Inner West Council is the roads authority under the Roads Act 1993) that is not minor or inconsequential.
- May involve installation of a temporary structure on, or the enclosing of, a public place that is under Inner West Council management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential
- May result in development on flood liable land that is susceptible to flooding
- May have a minor impact on the Electricity Substation No. 549, listed as a Local heritage item (I369)
- May have a minor impact on the St Peters Hotel, listed as a Local heritage item (I159)
- May have a minor impact on the King Street and Enmore Road Heritage Conservation Area listed as a Local heritage Conservation Area (C2)
- May have a minor impact on the Goodsell Estate Heritage Conservation Area listed as a Local heritage Conservation Area (C16).

Transport for NSW
71-79 Pyrmont Bridge Road, Pyrmont NSW 2009 NSW
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The following have been attached to this letter.

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Transport for NSW would be pleased to provide further information if required. In this regard, I may be contacted on [redacted] or by email Panduka.MANAMPERI@transport.nsw.gov.au.

Yours faithfully

Panduka Manamperi
A/Senior Project Manager

Transport for NSW
71-79 Pyrmont Bridge Road, Pyrmont NSW 2009 NSW
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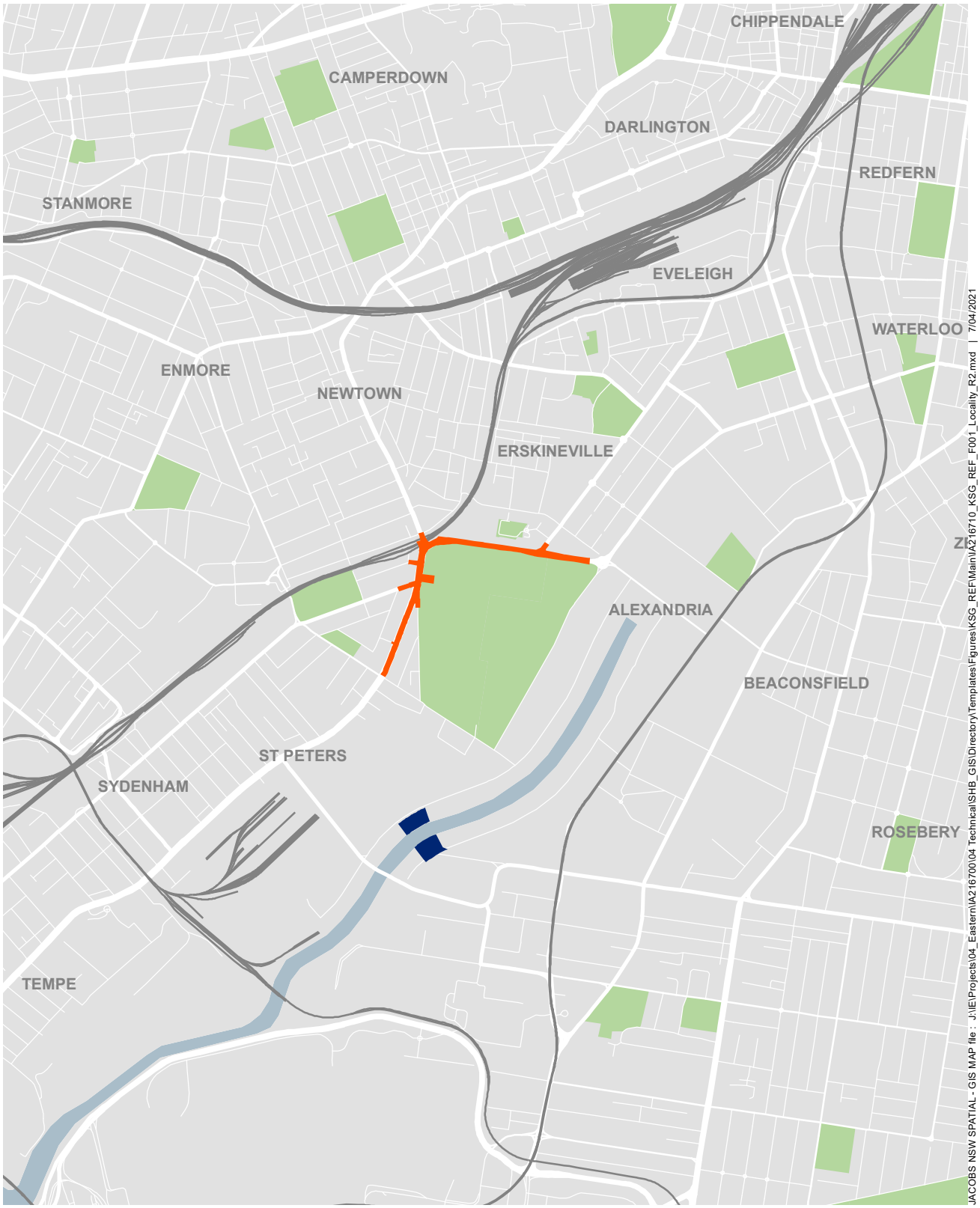

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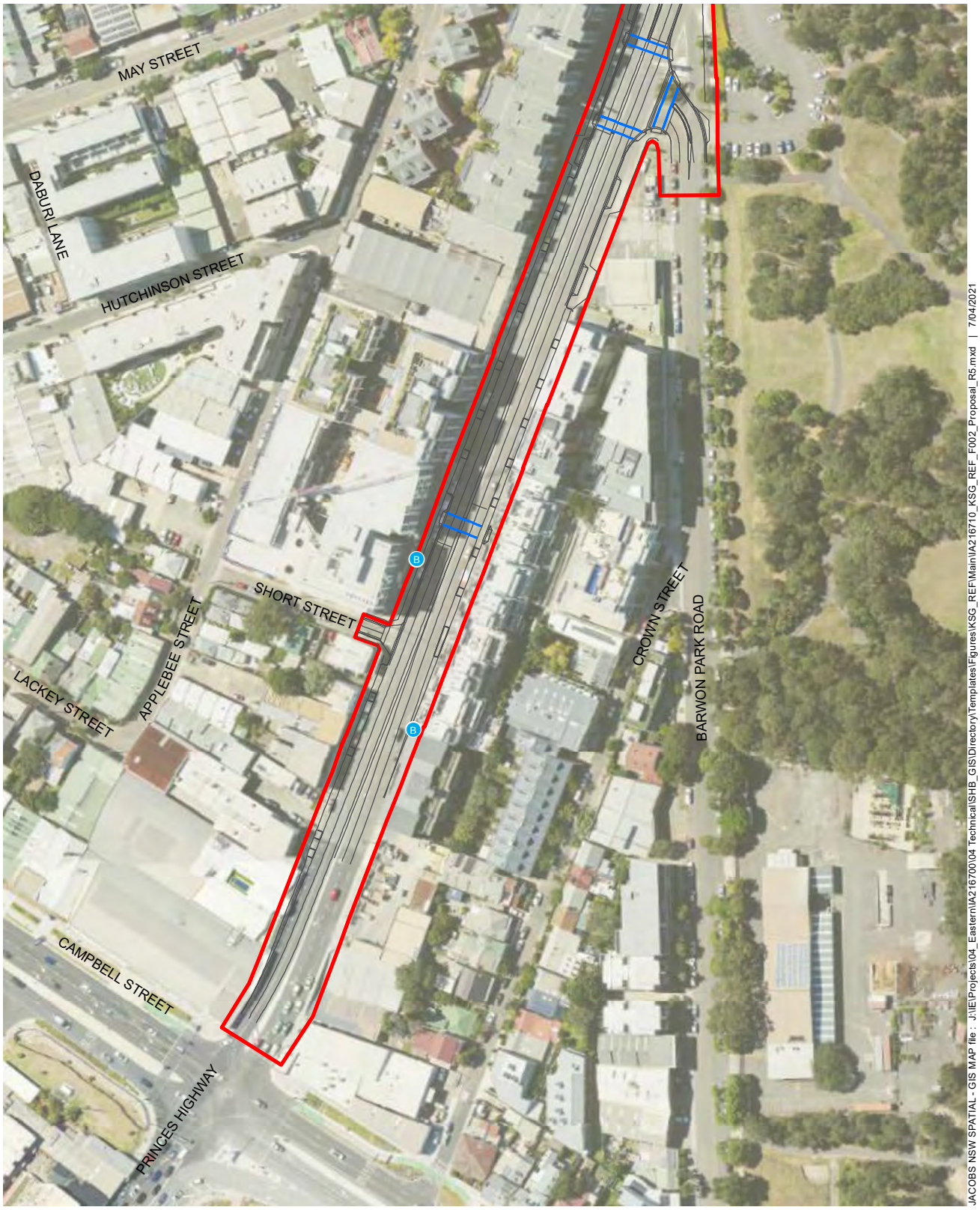

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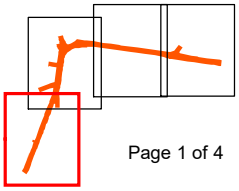

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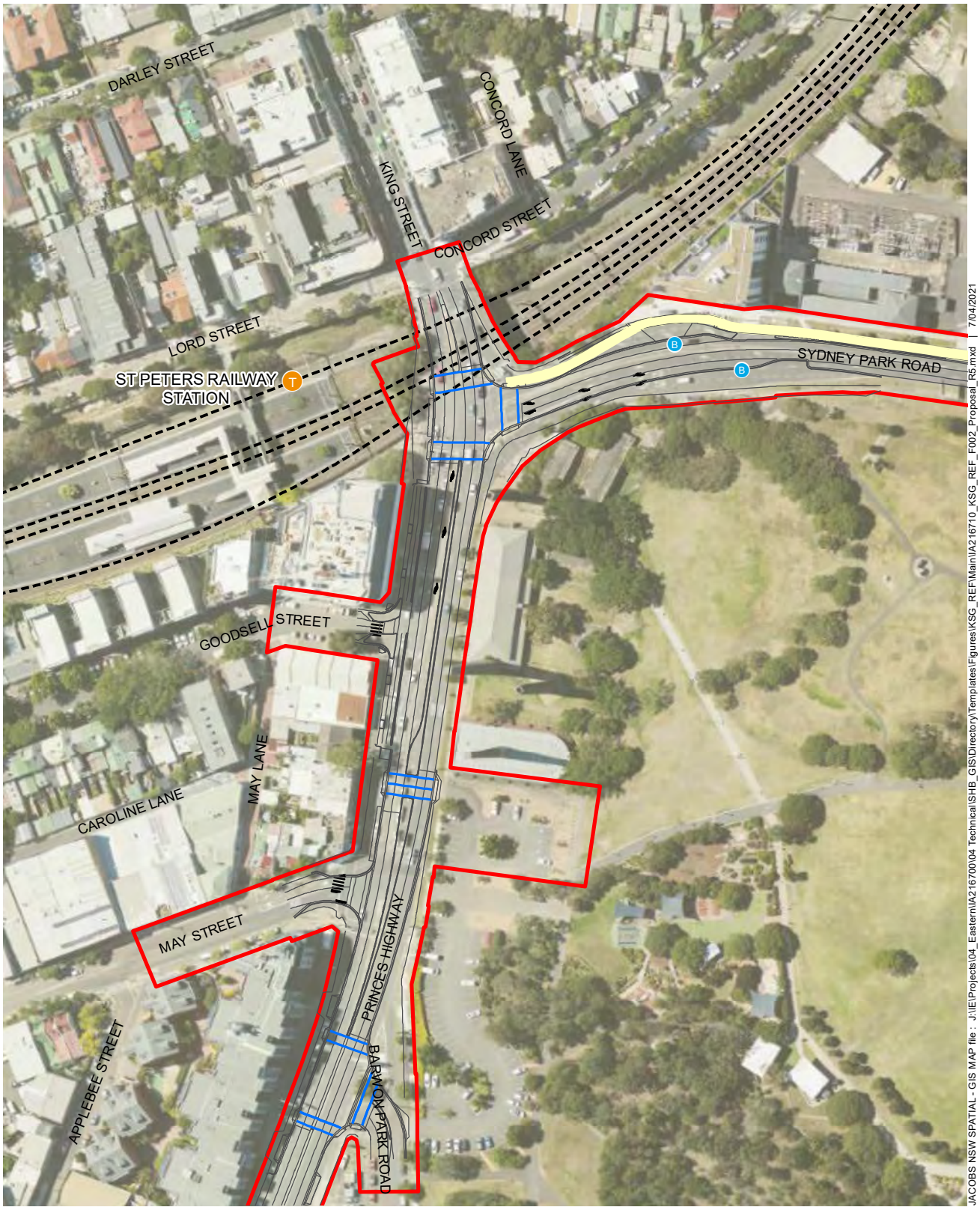
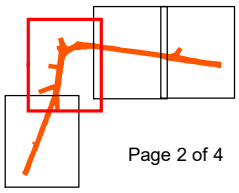
Figure 1-2 | The proposal

Sydney Park Junction



Legend

- Construction footprint
- Railway line
- Road
- Relocated bus stops
- Detail design
- Pedestrian/shared crossings
- Cycleway



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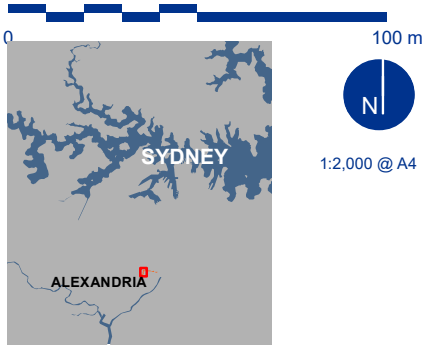

Figure 1-2 | The proposal

Sydney Park Junction

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Legend

- Construction footprint
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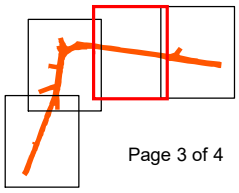

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Figure 1-2 | The proposal

Sydney Park Junction

Legend

- Construction footprint
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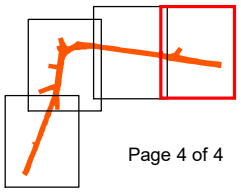


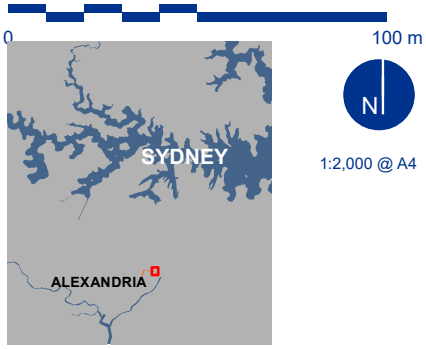


Figure 1-2 | The proposal
Sydney Park Junction

INNER WEST

28 May 2021

Panduka Manamperi
A/Senior Project Manager
Transport for NSW
71-79 Pyrmont Bridge Road
PYRMONT NSW 2009

Dear Mr Manmperi

KING STREET GATEWAY CONSULTATION:
CLAUSE 13 STATE ENVIRONMENTAL PLANNING POLICY (INFRASTRUCTURE) 2007

I refer to your letter to Council of 5 May 2021 in relation to the above. Council supports the King Street Gateway project and appreciates the opportunity to comment on the potential impacts on council infrastructure, flood liable lands and impacts on local heritage.

Relevant Council staff have reviewed the information you have supplied and have not raised concerns. As you would be aware, Council staff have been working with the Transport for NSW project team for some time to assess and resolve potential traffic,flooding and heritage issues as they arise. This process will continue as designs are further refined.

Regarding the draft Heritage Statement by Jacobs, specialist staff have not raised concerns subject to the implementation of the general and site-specific management measures as set out in Section 7 of the statement. Staff have noted that the statement did not identify that any stone kerbs & gutters would be affected by the work. If such stonework is to be affected, consideration should be given to retaining it in-situ in the locations where footways are to be widened. This is would allow for an interpretation of the historic road alignment.

I trust this advice is of assistance. Should your administration have any queries, please contact Council's Senior Transport Planner Kendall Banfield on [redacted]

Yours sincerely

Manod Wickramasinghe
Traffic & Transport Planning Manager

5 May 2021

Reference number: A37333080
File number: fA10152295

Zone Commander
State Emergency Services
4 Murray Rose Avenue
Sydney Olympic Park NSW 2127
soc@ses.nsw.gov.au

Dear Sir/Madam

Consultation regarding the proposed King Street Gateway project in St Peters, Newtown, Erskineville and Alexandria

Transport for NSW is proposing to undertake works for the King Street Gateway project.

It has been determined that this proposal may impact flood liable land, and as such, under the State Environmental Planning Policy (Infrastructure) 2007 clause 15AA, consultation with State Emergency Services (SES) in addition to the City of Sydney Council, and Inner West Council is required.

The following have been attached to this letter.

Attachment A – Proposal description
Attachment B – Proposal overview figures
Attachment C – The existing flood depths for the probable maximum flood (PMF) event within the proposal area

It would be appreciated if you could provide any comments about this proposal by 28 May 2021.

Transport for NSW would be pleased to provide further information if required. In this regard, I may be contacted on [redacted] or by email Panduka.MANAMPERI@transport.nsw.gov.au.

Yours faithfully

Panduka Manamperi
A/Senior Project Manager

Transport for NSW
71-79 Pyrmont Bridge Road, Pyrmont NSW 2009 NSW
W roads-maritime.transport.nsw.gov.au | ABN 18 804 239 602

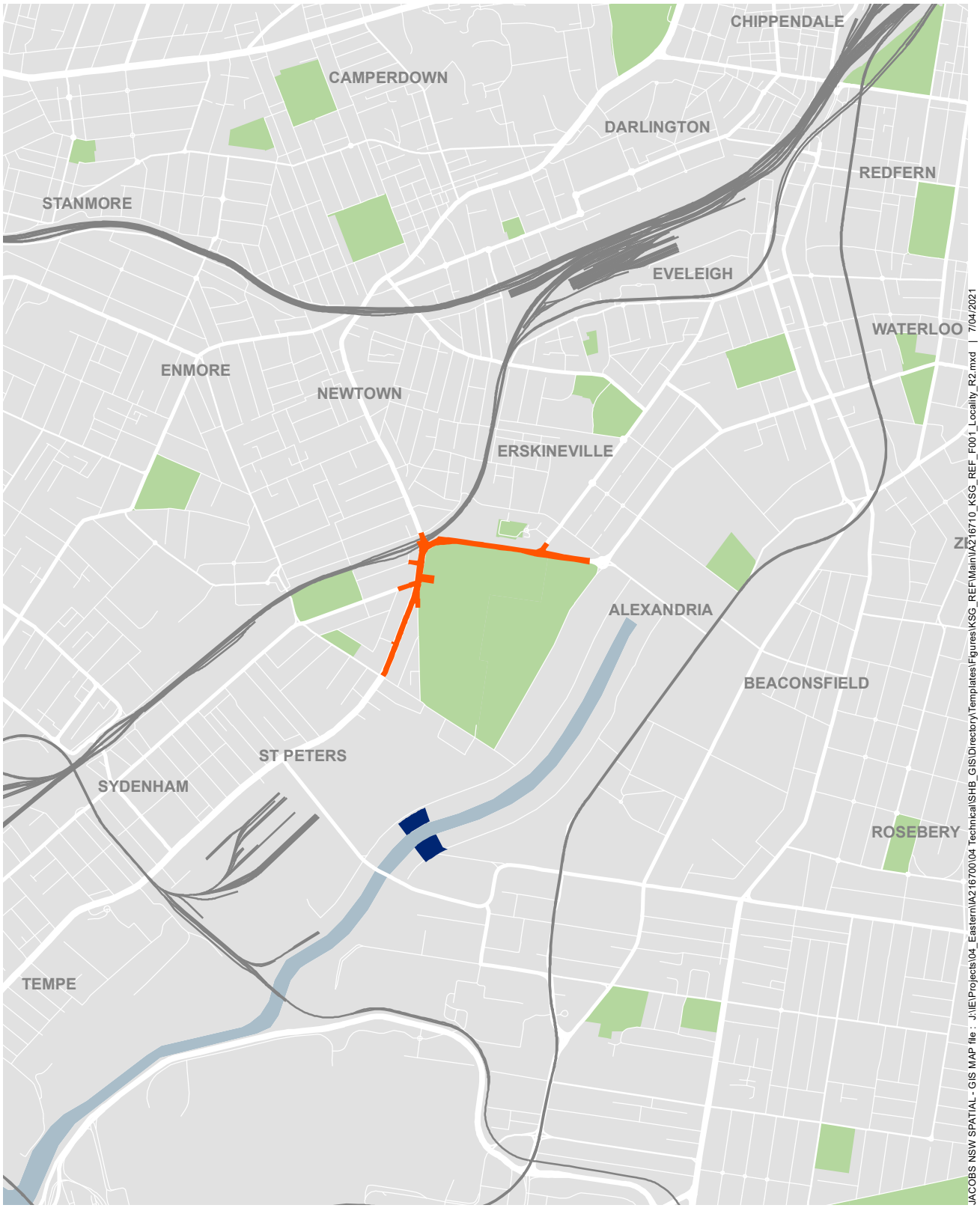
Attachment A: Proposal description

The key features of the proposal include:

- Reducing the Princes Highway/King Street carriageway from six lanes to four lanes from Campbell Street to Sydney Park Road (two lanes in each direction)
- Reducing the Sydney Park Road carriageway from four lanes to two lanes (one lane in each direction)
- Retaining the existing kerb line on Princes Highway, northbound and southbound verge.
- Providing dynamic community space for parklets and mixed-use footpath on both sides of Princes Highway.
- Providing parking bays for food trucks south of May Street.
- Providing landscaped buildouts on Sydney Park Road and Princes Highway.
- A new 2-way on-road segregated cycleway along the northern side of Sydney Park Road.
- A new 2-way on-road segregated cycleway on King Street northbound carriageway, between May Street and Sydney Park Road
- A new mid-block pedestrian shared crossing on Princes Highway at Short Street.
- A new mid-block separated crossing (pedestrian and cyclists) on Princes Highway between May Street and Goodsell Street (this will provide a new entrance to Sydney Park).
- Traffic signal and lane configuration works:
    - New traffic signals with new pedestrian crossings at the Barwon Park Road and Princes Highway intersection
    - Removing traffic signals at the Princes Highway/King Street and May Street intersection and re-configuring May Street to left in and left out only movements
    - Relocating existing traffic signals at the Princes Highway / King Street intersection
    - At the Princes Highway and Sydney Park Road intersection, removing a left turn and right turn lane from the Sydney Park Road eastern approach, removing one through lane from the Sydney Park eastbound departure, removing one left slip lane from the King Street northern approach, removing one through lane on the King Street southbound approach and removing one through lane on the King Street northern and southern departures. Replacing existing signalised pedestrian crossings with shared crossings on all approaches and relocating existing traffic signals
    - At the Sydney Park Road and Mitchell Road intersection, removing the dedicated right turn from the Sydney Park Road eastern approach; removing the right turn restriction to Sydney Park car park from the western approach; adding a no right turn restriction for Mitchell Road (bus excepted) and the Sydney Park car park exit and installing a new signalised shared crossing on the Sydney Park Road western leg.
- Reducing the posted speed limit of Princes Highway from 60 kilometres per hour to 50 kilometres per hour and Sydney Park Road from 50 kilometres per hour to 40 kilometres per hour
- New permanent parking on the southern side of Sydney Park Road

- Road re-surfacing at signalised intersections and along road corridor where required
- Kerb adjustments
- Removing the redundant bus stop in the westbound lane of Sydney Park Road, east of its intersection with Mitchell Road, and relocating the bus shelter to the existing bus stop to the west of the intersection
- Relocating utilities and adjustment of streetlights
- New landscaping along Princes Highway, King Street and Sydney Park Road
- Temporary construction facilities, including site compounds and ancillary facilities located at Burrows Road and Venice Street, Mascot located on Transport for NSW owned land.

Attachment B: Proposal overview figures



Legend

- Proposal area
- Compound locations
- Road
- Railway line

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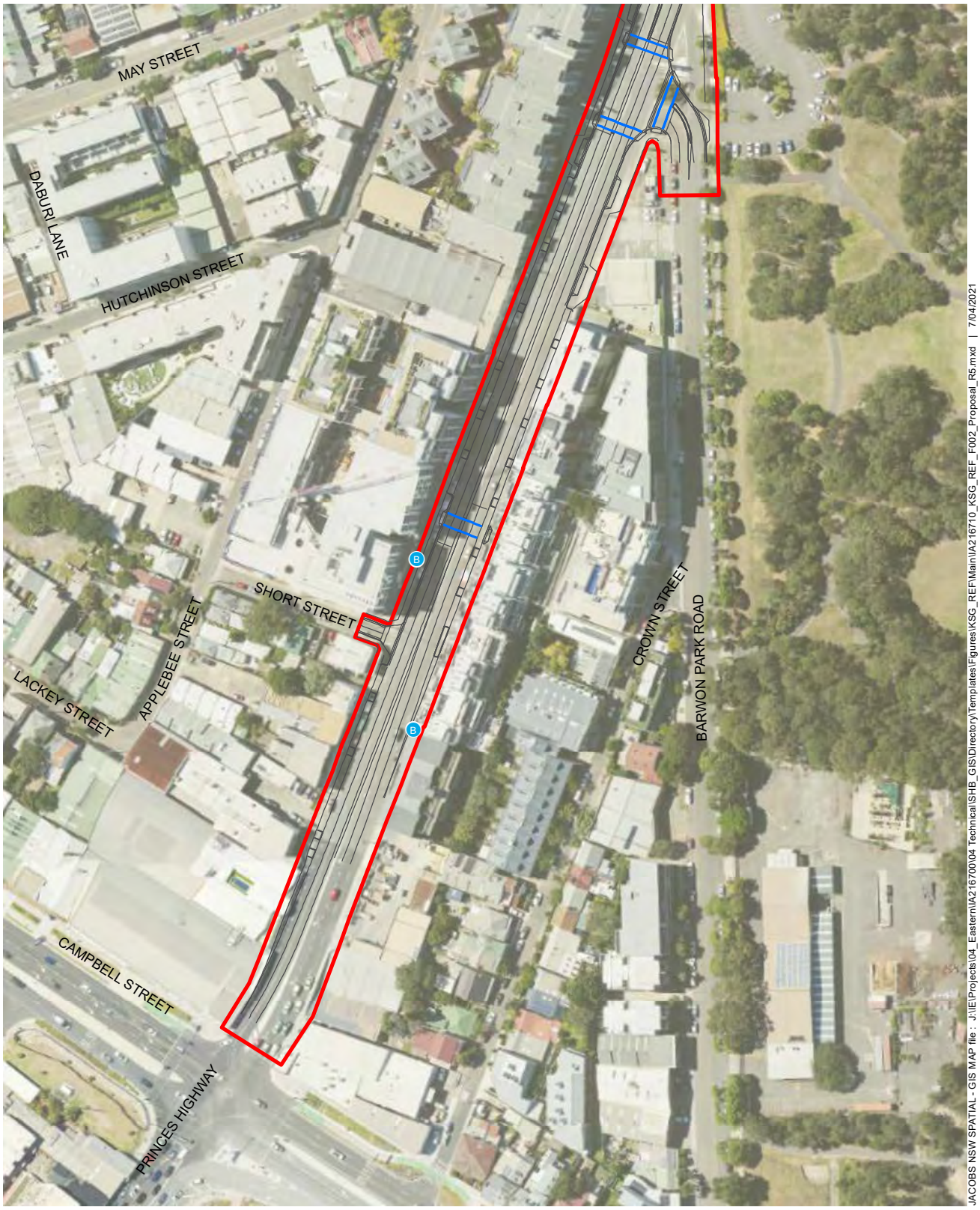
Figure 1-1 | The locality
Sydney Park Junction



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Legend

- Construction footprint
- Railway line
- Road
- Relocated bus stops
- Detail design
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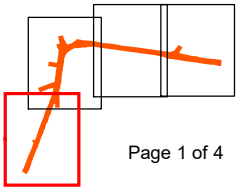

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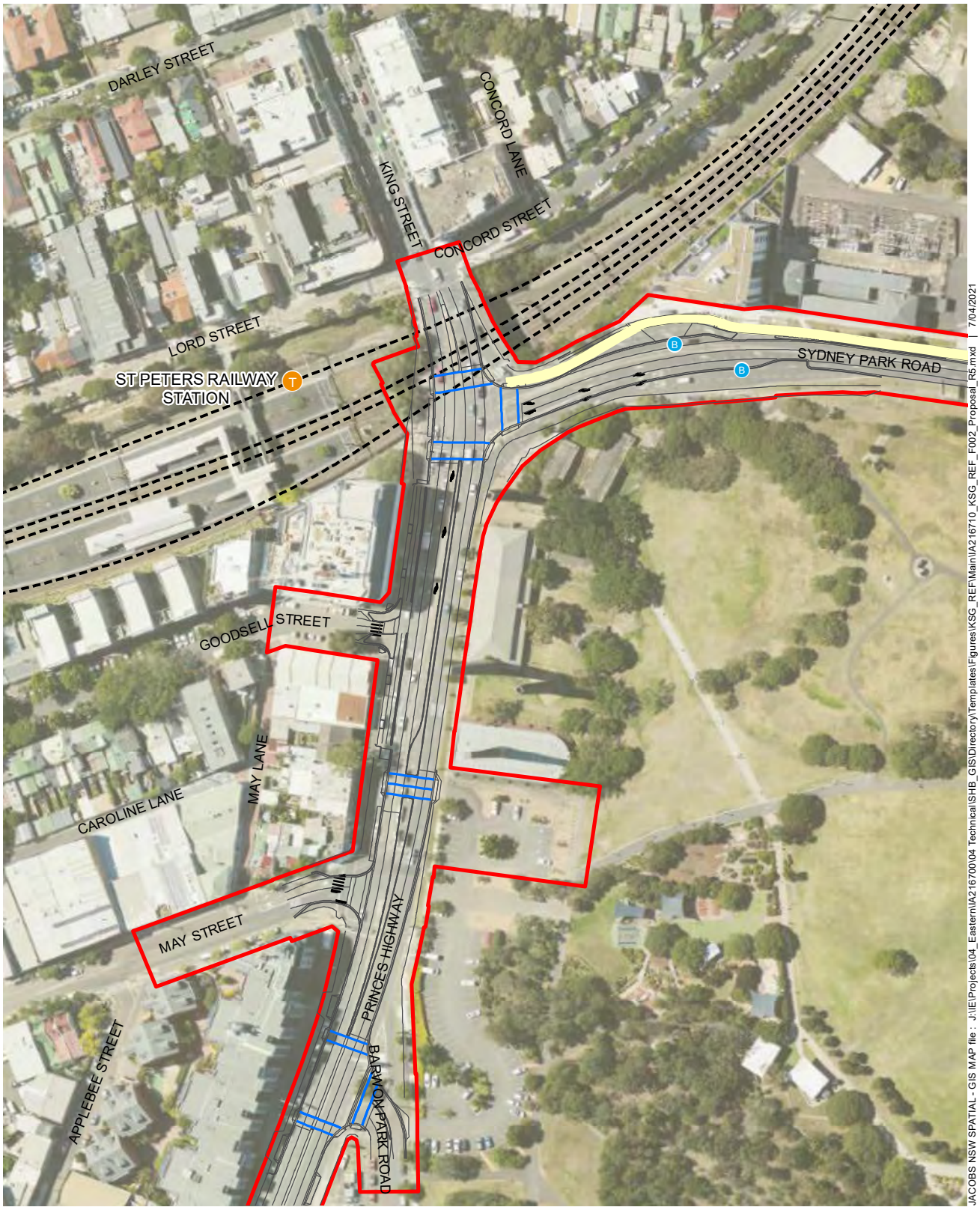
Figure 1-2 | The proposal

Sydney Park Junction



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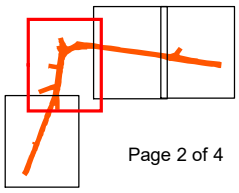

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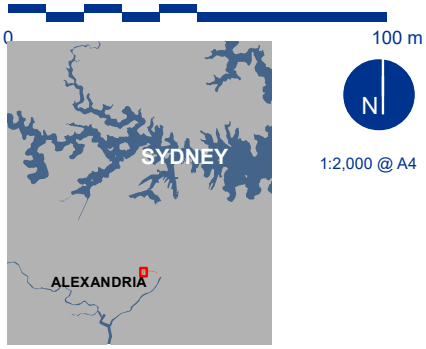

Figure 1-2 | The proposal

Sydney Park Junction

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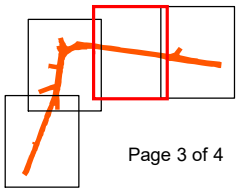

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Figure 1-2 | The proposal

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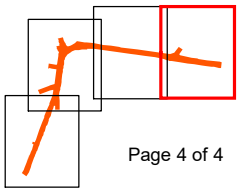

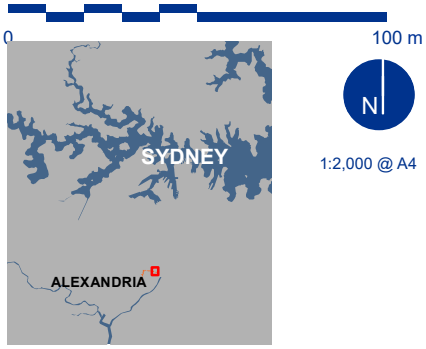

Figure 1-2 | The proposal
Sydney Park Junction

Attachment C: Existing flood depths for the PMF flood event

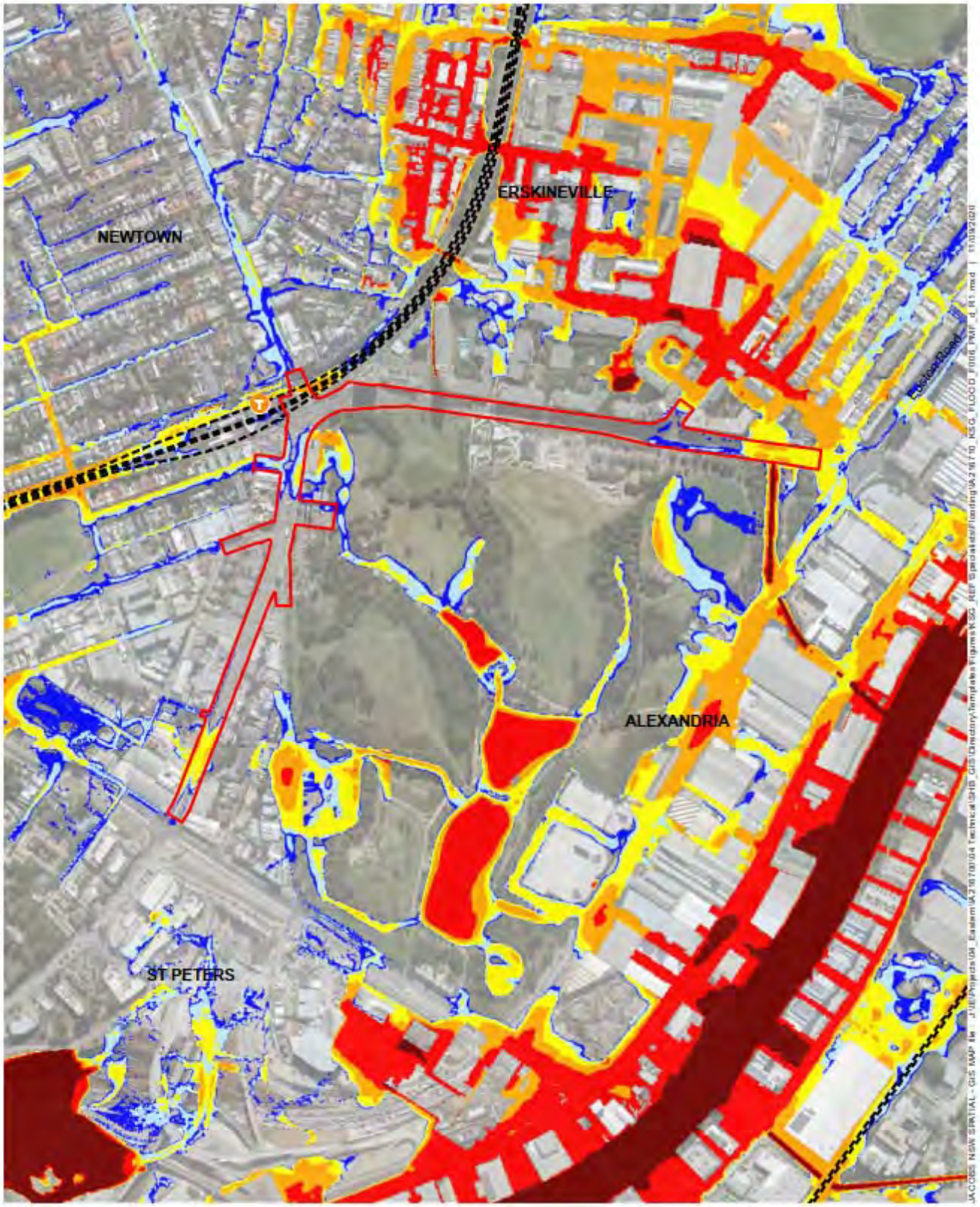

Figure 4-4 | Existing flood depth – Probable maximum flood event

Sydney Park Junction

Our Ref: ID 1377
Your Ref: A37333080

10th May 2021

Panduka Manamperi
Transport for NSW
71-79 Pyrmont Bridge Road
Pyrmont NSW 2009

Via email: Panduka.MANAMPERI@transport.nsw.gov.au

Dear Panduka,

Notification under clause 15AA of the State Environmental Planning Policy (Infrastructure) 2007 in relation to the proposed King Street Gateway Project

Thank you for the notification under clause 15AA of the *State Environmental Planning Policy (Infrastructure) 2007* in relation to the proposed King Street Gateway Project , St Peters, Newtown, Erskineville and Alexandria.

The NSW State Emergency Service (NSW SES) has reviewed the proposed upgrade using the information provided with the proposal and the flood risk information (e.g. local flood Plan, flood studies etc.) available to the NSW SES. Based on this review the proposed works appear to have minimal risk to NSW SES response operations.

Please feel free to contact me on [redacted] or via email at maria.frazer1@one.ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence.

Yours sincerely,

Maria Frazer
Coordinator Planning
NSW State Emergency Service

STATE HEADQUARTERS
93 - 99 Burelli Street, Wollongong 2500
PO Box 6126, Wollongong NSW 2500
P (02) 4251 6111
F (02) 4251 6190
www.ses.nsw.gov.au
ABN: 88 712 649 015

Appendix C

Traffic and Transport Assessment

Appendix D

Noise and Vibration Assessment

Appendix E

Statement of Heritage Impact

Appendix F

PACHCI Stage 1 Assessment

Appendix G

Stage 1 Contamination Assessment

Appendix H

Flooding Assessment

Appendix I

Likelihood of Occurrence and Assessment of Significance

Appendix J

Visual Impact Assessment

Appendix K

Social Impact Assessment

Appendix M

Air Quality Modelling (TRAQ)