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Alexandria Shared Path Connections
City of Sydney Council
09-Aug-2021

Review of Environmental Factors

Alexandria Shared Path Connections

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Alexandria Shared Path Connections

Client: City of Sydney Council

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Abbreviations

Abbreviation	Meaning
AAP	Areas of archaeological potential
ASS	Acid Sulfate Soils
ASSMP	Acid sulfate soil management plan
AZP	Archaeological Zoning Plan
BC Act	*Biodiversity Conservation Act 2016*
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CFT	Continuous Footpath Treatment
The City/Council	The City of Sydney Council
CLM Act	*Contaminated Land Management Act 1997*
CMMP	Contaminated Materials Management Plan
CNVMP	Construction Noise Vibration Management Plan
CO	Carbon Monoxide
dB(A)	A weighted decibels
DCP	Development Control Plan
DPIE	Department of Planning, Industry and Environment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ESD	Ecologically Sustainable Development
EMP	Environmental Management Plan
EMMP	Excavated Materials Management Plan
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*NSW Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPI	Environmental Planning Instrument
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999*
HMP	Heritage Management Plan
ICNG	Interim Construction Noise Guideline
ICOMOS	International Council on Monuments and Sites
Km	Kilometres
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metres

Abbreviation	Meaning
NEPM	National Environment Protection Measures
NES	National Environmental Significance
NO_2	Nitrogen Dioxide
NPI	National Pollutant Inventory
NPW Act	*National Parks and Wildlife Act 1974*
O_3	Ozone
OEH	Office of Environment and Heritage
Pb	Lead
PM	Particulate matter
POEO Act	*Protection of the Environment Operations Act 1997*
REF	Review of Environmental Factors
RMS	Roads & Maritime Services
RT Act	*Road Transport Act 2013*
SDS	Safety Data Sheet
SEPP	State Environmental Planning Policy
SO_2	Sulfur Dioxide
STA	State Transit Authority
Streets Code	City of Sydney Streets Code
The Minister	The NSW Minister for Planning
The Regulations	NSW Environmental Impact Assessment Part 5 Procedures Manual (City of Sydney)
TMAP	Transport Management Accessibility Plan
TMP	Traffic management plan
TPZs	Tree protection zones
Transport	Transport for NSW (TfNSW)
WARR Act	*Waste Avoidance and Resource Recovery Act 2001*
WMP	Waste Management Plan

1.0 Introduction

The City of Sydney (the City) propose to construct a new cycleway in the suburbs of Alexandria and Erskineville. This would include new shared paths along Mitchell Road and Buckland Street in Alexandria, and Swanson Street in Erskineville. A raised pedestrian and bicycle crossing is proposed at the intersection of Swanson Street and Park Street for pedestrians and people on bikes, and a continuous footpath treatment (CFT) would also be implemented across the northern end of Fox Avenue to facilitate the movement of people on bikes and pedestrians along Swanson Street. Collectively these works are referred to as the Proposal. The works are part of the broader Cycling Strategy and Action Plan for a More Sustainable Sydney.

In addition to the new shared path on Mitchell Road, Buckland Street and Swanson Street, the Proposal would include new signage and linemarking on Brown Street, Elliot Avenue, Park Street and Fox Avenue. This would enhance visibility and safety measures for people on bikes. Changes to Brown Street would include new signage and linemarking to allow people on bikes to travel in both directions on the existing one-way road. Changes to Park Street, Elliot Avenue and Fox Avenue would include new bicycle signage and changes to the corner kerbs that intersect with Swanson Street. The bus stop area on the corner of Swanson Street and Elliot Avenue would be built out in order to create space for people on bikes and pedestrians. All facilities are designed to provide a safer cycle and pedestrian network for the city's residents and workers.

The City of Sydney is both the proponent and the determining authority for this Review of Environmental Factors (REF) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This REF has been prepared by AECOM Australia Pty Ltd (AECOM) on behalf of the City of Sydney. The purpose of this REF is to describe the Proposal, assess the potential for the Proposal to result in environmental impacts, and to inform the decision to proceed with the Proposal. The Proposal and associated environmental impacts have been described in the context of clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), fulfilling the requirements of Section 5.5 of the EP&A Act.

This assessment finds that the Proposal would not result in any significant impacts upon the environment and as such may be approved with relevant mitigations applied. Detail of the environmental assessment is provided in the following sections of this REF.

1.1 Overview of the Proposal

1.1.1 Background

Sydney is Australia's largest global city. Transport demand in the city has been increasing over recent years, with the light rail, Sydney Metro and increased bus, ferry and train services helping to meet this demand. However, active transport (walking and cycling) remain the most efficient and sustainable ways to make short trips.

Cycling and walking are integral to Sydney's transport future because they are the most accessible, equitable, sustainable and reliable forms of transport. Since 2007, the City has invested an average of $11 million per annum to build a safe and connected bike network. This has resulted in cycling trips doubling across Sydney.

The *Cycling Strategy and Action Plan – For a more sustainable Sydney 2018 – 2030* (the Cycling Strategy and Action Plan) was prepared by the City to guide planning and development decisions to make bicycle transport easier, safer, more attractive and a feasible option for more people.

The aim of this strategy is to deliver a series of projects that provide safe and functional cycling facilities, separated from general traffic and pedestrians. The Proposal comprises one of five projects earmarked to deliver separated cycleways and shared paths throughout the City of Sydney Local Government Area (LGA).

This Proposal involves installation of a new shared path on the western side of Mitchell Road in Alexandria, the southern side of Buckland Street from Mitchell Road to the corner of Alexandria Park Community School, and the southern side of Swanson Street adjacent to Harry Noble Reserve in

Erskineville. Shared paths allow important network links where road space is too limited for a full separated cycleway.

The proposed shared paths seek to minimise additional infrastructure requirements whilst contributing positively to the safety, functionality and amenity of the streets for all users. The proposed shared paths offer a safer cycle and pedestrian network without compromising essential motorised vehicle operations, pedestrian space and the legibility of the street as an urban place.

1.1.2 Key features of the Proposal

Key features of the Proposal include:

- Road and pavement adjustments, including modifications to existing kerb-lines, gutters, and existing services to support the installation of a shared path on Swanson Street, Buckland Street and Mitchell Road
- A raised pedestrian and bicycle crossing at the intersection of Swanson Street and Park Street, including the extension of the hardstand area and installation of road to pavement ramps
- Continuous Footpath Treatment (CFT) at the intersection of Fox Avenue and Swanson Street Adjustment of some drainage pits and stormwater pipelines in association with kerb and gutter realignments. All new drainage pits and grating would be ‘bike-safe’
- Installation of new or replacement roadside signage
- Landscaping
- Relocation or adjustment of utilities and street lighting to suit approved design alignment of the shared path
- Provision of surface finish to the new shared paths in accordance with City of Sydney specifications
- New line marking on adjacent roads and on the shared path
- Changed traffic light phasing to provide for cycle phases, where necessary.

1.2 Site analysis

1.2.1 Proposal location and context

The Proposal is located within the City of Sydney LGA, within the inner-city suburbs of Erskineville and Alexandria. The location of the Proposal in a regional context is shown on **Figure 1-1**.

Figure 1-1 Regional Extent of Proposal Area and Site Location

1.2.2 Proposal Area

The Proposal Areas include all areas where works would be undertaken and the locations of all ancillary facilities, including temporary construction material laydown areas. This report refers to the Proposal in two parts: 'Proposal Area (Swanson Street)' and 'Proposal Area (Mitchell Road)'. The location of the two Proposal Areas are shown on **Figure 1-2** and **Figure 1-3**.

Figure 1-2 Proposal Area (Swanson Street)

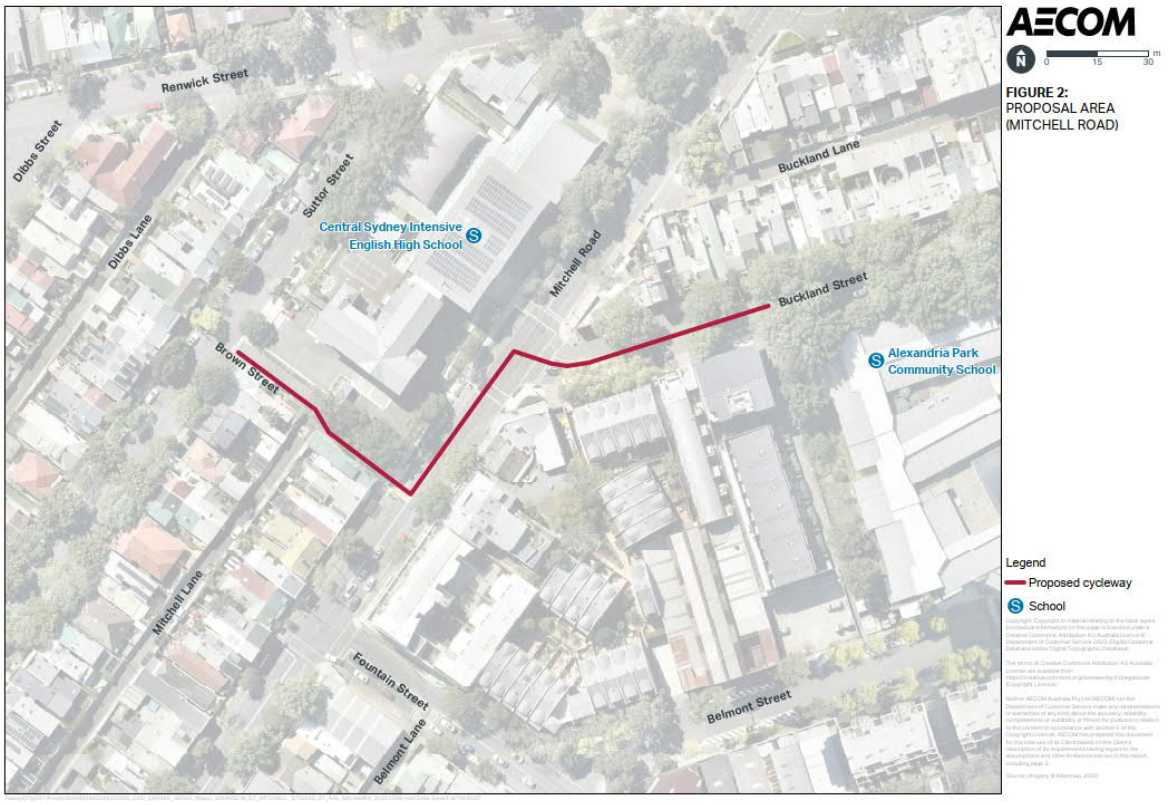

Figure 1-3 Proposal Area (Mitchell Road)

Land uses surrounding the Proposal footprint include office premises, low-medium-density residential premises, food and drink premises, commercial and retail premises, parks, and schools.

Sensitive receivers (land uses which are sensitive to potential noise, air and visual impacts) along Swanson Street, Mitchell Road, Brown Street and Buckland Street include:

Proposal Area (Swanson Street)	Proposal Area (Mitchell Road)
Residential receivers along Swanson Street between Fox avenue and Elliot avenue	Residential receivers on Buckland Street and Mitchell Road
Commercial receivers at both corners of Swanson and Park Street	Commercial receivers at the corner of Buckland and Mitchell Road
SDN Erskineville Children's Education (corner of Swanson Street and Clara Street)	Sensitive receivers at Alexandria Community School
St Mary's Catholic Primary School (on Swanson Street)	Sensitive receivers at Central Sydney Intensive English High School
Users of Erskineville Oval	

1.2.3 Existing zoning

The applicable land zoning for the Proposal is specified by the *Sydney Local Environmental Plan 2012* (Sydney LEP). The Proposal footprint is located within an area with a variety of land use zonings.

Land zones within and adjacent to the Proposal footprint comprise the following:

- R1 – General Residential
- RE1 – Public Recreation
- B4 – Mixed Use
- SP2 - Infrastructure (classified road)
- SP2 – Infrastructure (educational establishment).

2.0 Need and options considered

This chapter discusses the need and objectives of the Proposal within the context of the broader objectives of the Cycling Strategy and Action Plan. This chapter also provides a summary of the options that have been considered during development of the Proposal and justification as to why the preferred option has been chosen.

2.1 Strategic justification

2.1.1 Overview

The provision of cycleway infrastructure can have immediate and long term impacts on usage, according to the *Inner Sydney Regional Bicycle Network Demand Assessment and Economic Appraisal* (AECOM 2010).Significant increase in usage has been observed where shared paths have been constructed, for example, the development of Maylands Principal Shared Path saw cycling levels increase by approximately 80% after opening in 2003.

The *Inner Sydney Regional Bicycle Network Demand Assessment and Economic Appraisal* discusses the fragmented and disjointed nature of Sydney's bicycle network. The lack of safe and available cycling connections forces people on bikes to mix with general traffic, which can lead to conflicts with large vehicles. Safety concerns arising from this risk may discourage cycling as an option. However, the report found that up to 84% of non-regular people on bikes would be willing to consider cycling or cycling more often if dedicated cycleways and off-road routes were available. These shared paths provide a separation from motorist traffic alleviating some safety concerns of mixing with heavy traffic. They also support the connection of the bicycle network to other shared and separated paths, thereby contributing to the safety of Sydney's cycling network as a whole. The report also included community feedback showing that there is a strong public desire for greater levels of dedicated cycling infrastructure.

2.1.2 Relevant policies and strategies

The Proposal would be consistent with the policies and strategies that are described below.

Environmental Action 2016 – 2021: Strategy and Action Plan

Sustainable Sydney 2030 outlines the community expectation that the Sydney LGA should be an environmental leader on a global scale. To guide the implementation of *Sustainable Sydney 2030*, the City of Sydney developed a series of environmental master plans and strategies between 2008 and 2015. The *Environmental Action 2016 – 2021: Strategy and Action Plan* combines the insights and data from those documents.

Sustainable Sydney 2030 Vision

The Sustainable Sydney 2030 Vision proposes a Liveable Green Network to provide safe, quality, continuous routes for pedestrians and people on bikes. It proposes a cycling network that is safe enough for children to use, giving priority to separated, dedicated cycle lanes. The Proposal would be consistent with this objective.

Cycling Strategy and Action Plan 2018-2030

The City of Sydney's *Cycle Strategy* supports the Sustainable Sydney 2030 vision. The City of Sydney's *Cycling Strategy and Action Plan 2018-2030* outlines the vision for cycling in Sydney. This includes an objective to connect the existing cycleway network and to make it safer for people to use. Actions to achieve this that are relevant to the Proposal include:

- Completing the 11 regional bike routes, and substantially complete the local bike network
- Build the regional routes as separated cycleways where feasible and necessary
- Add local wayfinding signs
- Improve safety and access by including measures such as:
  - replacing bicycle shoulder lanes

  - adding new contra-flow provisions
  - lowering speeds and reducing traffic on local streets
  - installing kerb ramps at road closures
  - upgrading stormwater grates to be bike-safe
  - maintaining road surfaces and coordinating with utility authorities where required
  - ensuring regular asset inspections, street cleaning and maintenance of the bike network and associated signage
- Continue to provide bike parking in the public domain where needed and on request, including on-street bike parking corrals in suitable high demand locations, and continue to provide bike racks for public schools in our area
- Provide shared paths on, and alternative routes for, state roads where the City is not currently permitted to reallocate road space
- Investigate and respond to suggestions and comments from our community about the bike network to improve safety, access and comfort
- Advocate to the NSW Government to complete the *Sydney City Centre Access Strategy* bike network
- Advocate for TfNSW to fully fund their portion of the network and pursue multi-year funding agreements with TfNSW
- Consider all bike network users, including those on cargo bikes, e-bikes, trishaws and mobility scooters, in the design of infrastructure.

Sydney Metropolitan Strategy

A Plan for Growing Sydney (The Sydney Metropolitan Strategy) was released in 2015 as the NSW Government's 20-year plan for the Sydney Metropolitan Area. It provides direction for Sydney's productivity, environmental management and liveability; and for the location of housing, employment, infrastructure and open space. The Plan establishes a vision for Sydney as a strong global city, and great place to live. The vision is supported by key goals and principles aimed at encouraging improvements in transport infrastructure, housing, resilience and sustainability while maintaining a strong and competitive economy. The Proposal would be consistent with The Plan, as it would enhance transport infrastructure, improve connectivity, and provide increased amenity for residents, workers and visitors.

Our Greater Sydney 2056, A metropolis of three cities

In October 2017, the Greater Sydney Commission published *Our Greater Sydney 2056*, which supports the vision for a metropolis of three cities to balance growth and deliver its benefits more equally and equitably to residents across Greater Sydney.

The Proposal is consistent with the broader metropolitan vision for Greater Sydney by ensuring that it would support local access for an increasing number of residents moving in the area.

2.2 Proposal objectives

The objectives of the Proposal are consistent with those that described in the Cycling Strategy and Action Plan and associated strategic plans. That is, the Proposal aims to provide active transport infrastructure that supports the movement of people on bikes along Mitchell Road, Swanson Street and Buckland Street that:

- Is safe and functional
- Is separated from general traffic and pedestrians
- Meets current and future community needs
- Prioritises people on bikes.

The proposed new shared path on Mitchell Road, Swanson Street and Buckland Street Proposal would be constructed over the existing footpath. The proposed works on Brown Street, Elliot Avenue

and Park Street would take place within the existing road corridor and involve minor works such as line markings, new lighting, and new signage.

The Proposal would require minimal additional infrastructure and would result in a series of measures that enhance the safety, functionality and amenity of the street for people on bikes, whilst maintaining essential traffic operations, pedestrian space and the legibility of the street as an urban place.

2.3 Alternatives considered

Option 1 – 'Do Nothing'

Option 1 would involve no shared path to be constructed at Mitchell Road, and no upgrade works to take place on Swanson Street, or Buckland Street. This option would not achieve the Proposal objectives, nor would it achieve the City of Sydney's strategic objectives. Therefore the 'Do Nothing' option is not the preferred option.

Option 2 – Mitchell Road, Swanson Street and Buckland Street shared path - Preferred Option

This option meets the objectives of the Proposal as well as the relevant strategy documents by increasing access and safety for people riding bikes and pedestrians along Swanson Street, Mitchell Road and Buckland Street. It would also improve modal integration by developing infrastructure that ties in with and complements the wider transport network, inclusive of existing cycleway and shared path networks in the area.

2.4 Proposal benefits

The *Inner Sydney Regional Bicycle Network Demand Assessment and Economic Appraisal* (AECOM, 2010), found that the key benefit of separated cycleways is the perceived and actual safety they offer to people on bikes. Although the proposed works are for shared pedestrian cycleway, it has been found that the level of separation between people on bikes and motorists is a key driver in both actual and perceived safety, which in turn is a key driver of demand for cycling (AECOM, 2010).

Benefits arising from increased uptake of cycling as a mode of transport may include:

- Time travel savings
- Environmental savings including as a result of reduced greenhouse gas emissions, air pollution and noise
- Savings on public transport vehicle procurement, operation and maintenance as well as reduced road infrastructure investment
- Infrastructure investment timing and budget
- Cycling-specific benefits including improved public health and journey ambience.

The Proposal would also result in the following specific benefits:

- Improved access and journey time reliability for people on bikes
- Improved integration with public transport through reduced vehicle traffic congestion
- Public transport de-crowding
- Improved equity and accessibility outcomes
- Improved localised economic activity and potential for wider economic benefits beyond the transport sector
- Reduced energy dependence and transport emissions.

3.0 Proposal description

Chapter 3.0 describes the Proposal in detail and summarises key design features, construction method, timing and duration, site access, ancillary facilities and utility adjustments. The description of the Proposal is based on the concept design and is subject to detailed design.

3.1 The Proposal

As described in **Section 1.1.2**, the primary feature of the Proposal involves new shared paths alongside Mitchell Road, Swanson Street and Buckland Street.

The Proposal Area (Mitchell Road) would consist of installation of a new shared path on the western side of Mitchell Road from its intersection with Brown Street, to its intersection with Buckland Street, for a distance of about 60 metres, and from Buckland Street to its intersection with Mitchell Road to Alexandria Park Community School, for a distance of about 70 metres.

The Proposal Area (Swanson Street) would consist of a new shared path which would extend along the southern side of Swanson Street from its intersection with Elliott Avenue to its intersection with Fox Avenue, for a distance of about 165 metres.

To deliver the new shared paths, the following works would be required:

- Road and pavement adjustments
- Adjustment of some drainage pits and stormwater pipelines
- Installation of new or replacement roadside furniture and signage
- Landscaping
- Relocation or adjustment of utilities and street lighting
- Surface finishes and line marking

Details of these proposed works are outlined in the following section.

3.1.1 Scope of works

Within the Swanson Street section of the Proposal Area the following works would be undertaken:

Swanson Street works

- Existing kerb and gutter to be removed from the corner of Elliott Avenue down Swanson Street for a distance of about 35 metres to allow for the construction of an extended kerb area for the bus shelter, and people riding bikes and pedestrians using the shared path. The new kerb build-out would extend about one metre into the existing roadway
- The pram ramp on the northern side of the existing pedestrian crossing fronting onto Swanson Street would be re-built in order to tie into the extended hardstand area
- A new drainage pit would be provided on Swanston Street, about 45 metres west of its intersection with Fox Avenue
- A small area of existing kerb and pavement would be removed to facilitate proposed drainage works (an area comprising about 1 metre x 3 metres) on Swanston Street, about 45 metres west of its intersection with Fox Avenue. The kerb and gutter in this location would be re-established following the completion of drainage works
- New ‘shared path’ line marking would be provided at several intervals along the newly established shared path
- Street signage would be provided.

Fox Avenue works

- A new CFT would be constructed on Fox Avenue, at its intersection with Swanson Street

- Existing kerb and gutter and footpath to be removed at the Swanson Street end of Fox Avenue to facilitate the construction of the new CFT
- The kerb and gutter and new shared path would be established in a build-out arrangement and would comprise a mix of brick and concrete areas (brick in the western half, concrete in the eastern half)
- New 12.5 metre long grated trench drains would be installed along both sides of Fox Avenue, commencing from its intersection with Swanson Street
- Shared path line marking would be provided
- Street signage would be provided.

Park Street works

- The existing kerb at gutter the east and west sides of Park Street at its intersection with Swanson Street would be removed to about 25 metres on either side. The area of pavement to be removed would be about 150 m^2 on either side
- The area of removed kerb and pavement would be replaced and would include two new kerb build-outs on the eastern and western sides, and the provision of a new raised pedestrian and bicycle crossing at the Swanson Street intersection.
- Two new drainage kerb inlet pits would be provided on the northern side of the new kerb build-outs.
- Two new drainage pipes would be provided. The new drainage pipes would travel from the new drainage pits to the south to connect to the existing manhole in the Park Street roadway, for a distance of about 10 metres each.
- Street signage would be provided
- New kerbside planting on both sides of the new raised shared crossing.

Elliot Avenue works

- New line marking and signage would be provided at the northern end of Elliot Avenue to allow bicycles a contraflow provision on the existing one-way laneway.

Within the Mitchell Road section of the Proposal Area, the following works would be undertaken:

Mitchell Road works

- The pram ramp at the southern pedestrian crossing at the intersection of Mitchell Road and Buckland Street would be rebuilt
- New kerbs and a widened pram ramp would be constructed in this located and small landscaped gardens would be provided on either side of the pram ramp
- The existing Telstra pit lid in this location would be adjusted to tie in with the modifications in this location
- New 'shared path' line markings would be painted on the path to denote the extent of the new shared path.

Brown Street works

- New line marking would be provided at either end of Brown Street to allow bicycles a contraflow provision on the existing one way laneway
- New lights would be provided on existing poles at the western corner of Mitchell Lane and Brown Street, and at the corner of Brown Street and Mitchell Road.

Buckland Street works

- The existing garden bed located on the south eastern corner of Mitchell Road and Buckland Street would be partially removed and the shared path would be extended within this area. The remaining portion of the garden would be rebuilt.

- About 25 metres from the intersection of Mitchell Street, an area of asphalt footpath about 5 m x 3 m that is currently in poor condition would be removed and replaced
- The existing asphalt pavement and stone kerb, and pram ramp at the path between the school and 92 Buckland Street would be removed
- These removed items would be replaced with a new built-out kerb with a new pram ramp and gutter bridge. The shared path would be re-established to tie in the with the existing shared path. The kerb extension and pram ramp would allow people on bikes to easily access the mixed traffic bicycle route along the rest of Buckland Street
- The existing painted line markings stating “end” at the path between the school and 92 Buckland Street would be removed using a pressure washer
- New ’shared path’ line marking would be painted to demark the extent of the new shared path.

3.1.2 Construction timing and duration

Subject to approval, construction is anticipated to commence in October 2021 and take about nine months to complete. This REF is based on the concept design for the Proposal, and refinement of the proposed construction methodology is anticipated to take place following the appointment of the construction contractor. Any future refinements would take place in consultation with the City of Sydney.

Construction staging would be dependent on the construction contractor’s preferred methodology, program and sequencing of work. Should the construction contractor’s methodology contain substantive departures from that outlined within the REF, further assessment would be undertaken to consider any new or altered environmental or amenity impacts.

Most works required for the Proposal would be undertaken during standard construction hours as follows:

- Monday to Friday, 7am to 6pm
- Saturday, 8am to 1pm
- Sunday and Public Holidays, no work.

Where OOHW works would be required, they would be carried out Sunday to Thursday from 9:00 pm until 5:00 am.

Generally, the scheduling of noisier activities (such as concrete cutting) would take place around times of higher background noise. Where OOHW would be required, noisier activities would be completed prior to 11pm. Additionally, works would be short term and temporary and would take place progressively along the alignment, limiting the duration that any one sensitive receiver may be exposed to any construction noise. A plan would be developed for night work to determine the number of nights that work could occur and the type of works to minimise the potential noise impacts to nearby sensitive receivers.

Work would be carried out taking consideration Section 6 Work practices of the ICNG, work outside normal working hours would be considered in consultation with relevant stakeholders. Procedures would include notifying sensitive receivers prior to works commencing.

3.1.3 Plant and equipment

An indicative list of plant and equipment likely to be used during construction of the Proposal includes:

- Air compressor
- Backhoe
- Bobcat
- Concrete agitator
- Concrete saw
- Concrete truck
- Concrete vibrator
- Hand tools
- Water cart.
- Jackhammer
- Line marking equipment
- Mini excavator
- Road planner
- Small tip truck
- Vacuum truck
- Vibratory roller
- Wacker packer

3.1.4 Earthworks

Earthworks would be minor, resulting from removal of the surface layer of the pavement overlaying the proposed shared path alignment, widening and realignment of pavement, bus shelter removal and reinstatement as well as kerb reconstruction and realignment.

The level of excavation is likely to be limited to less than a metre in most locations, and associated with the installation of garden beds, footings, signage, and the bus shelter foundations. Trench excavations for stormwater drainage would be up to 1.5 metres deep. Small amounts of waste material would be generated from construction activities such as excavation for stormwater infrastructure, replacement of the existing road pavement and kerb and gutter adjustments.

A total of about 660 cubic metres of material would be excavated during the construction of the Proposal including about 100 cubic metres of concrete, 180 cubic metres of asphalt and 380 cubic metres of general solid waste. All waste generated from excavation work would be taken to and disposed of at a licensed off-site disposal facility.

3.1.5 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal and would consider the requirements of ISCA IS Rating Scheme version 1.2. Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.1.6 Construction traffic and access

All proposed work sites have easy access to the local road network. Access to the site would therefore use the existing local road network such as Swanson Street and Mitchell Road.

Traffic generated by construction activities would include construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, and construction plant and equipment.

The traffic generated from the construction phase of the Proposal is not anticipated to exceed 12 light vehicles and 2 heavy vehicles per day during peak construction periods. In addition to the generation of vehicles the Proposal would also involve the operation of mobile plant and equipment.

During construction, the ordinary movement of vehicles, people riding bikes and pedestrians would be altered. Partial lane closures and pedestrian/bike riding diversions would be in place at each work site. To minimise impacts as far as reasonably practicable, some works would be undertaken outside of peak traffic hours. In addition, traffic management and mitigation measures, as well as appropriately planned construction staging would seek to reduce impacts. Other nearby cycleway construction projects should be considered, and the proposed works should be carried out provided there are no cumulative access barriers created during the time of construction. These items are considered in the following potential impacts from potential traffic and transport access disruptions.

The Proposal may require road closures for the installation of raised crossings or continuous footpath treatments at some locations. Appropriate diversions and scheduling of disruptive works would be managed in the CEMP.

Emergency vehicle access would be maintained at all times during construction, as would rubbish truck access (as necessary).

3.1.7 Ancillary facilities

Construction ancillary facilities such as construction compounds are not anticipated to be required for the Proposal. Subject to the timing of other nearby cycleway projects, it would be unlikely that the current Proposal on its own would require the support a full construction compound. The need for a construction compound would be considered within the CEMP, which would consider cumulative impacts including the timing of other cycleway projects.

As an alternative, it is anticipated that sections of the Proposal footprint would be progressively fenced off as works would take place along the alignment, and that the majority of works would take place behind the fence. A small area (approximately one or two parking spaces) on the side of the road may be used to accommodate storage of materials, plant and equipment, if required.

Detailed construction planning would be undertaken so that vehicles, plant and equipment would be limited to those specifically required for the work that would be taking place on any given day. Where practicable to do so, materials, plant and equipment would be removed from the site following the completion of the workday.

3.1.8 Public utility adjustment

The Proposal footprint would be anticipated to include electrical transmission lines, telephone lines, water mains and other utility infrastructure. Some public utilities may need to be relocated during construction.

Consultation with public utility authorities would be carried out as part of the development of the detailed design to identify and locate existing utilities and incorporate utility authority requirements for relocations and/or adjustments.

4.0 Statutory and planning framework

This chapter provides a summary of the statutory considerations relevant to the Proposal, including a consideration of Commonwealth legislation, NSW legislation and policies, and local environmental planning instruments.

4.1 Commonwealth planning policy

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The (Commonwealth) *Environment Protection and Biodiversity Conservation Act* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the EPBC Act as 'Matters of National Environmental Significance' (MNES). The EPBC Act requires the assessment of whether the Proposal is likely to significantly impact on MNES or Commonwealth land. These matters are considered in full in **Appendix A**.

The Proposal would not significantly affect any MNES or Commonwealth land. Therefore, a referral to the Commonwealth Minister for the Environment is not required.

4.1.2 Other Commonwealth legislation

Table 4-1 provides a list of other relevant Commonwealth legislation applicable to the Proposal.

Table 4-1 Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. Mitigation measures have been proposed in **Section 6.5** to ensure that uncovered items of Aboriginal heritage, or Aboriginal remains (should they be uncovered), are dealt with appropriately and in accordance with the applicable legislation. Due diligence searches for existing Aboriginal heritage has been carried out and appropriate mitigation measures have been proposed so that nearby heritage items are not affected.
Native Title Act 1983	This Act aims to provide for the recognition and protection of Native Title, how Native Title land is used and establishes a mechanism for determining claims to Native Title. There are no pending or approved Native Title claims over the Proposal Area.

4.2 State planning policy

4.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act* (EP&A Act) establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of Division 5.1 of the EP&A Act. This division specifies the environment impact assessment requirements for activities undertaken by public authorities such as City of Sydney, which are permissible without development consent.

In accordance with section 5.5 of the EP&A Act, City of Sydney, as the proponent and determining authority, must examine and consider to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal. Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has a significant impact on the environment.

Chapter 6.0 of this REF provides an environmental impact assessment of the Proposal in accordance with clause 228, and **Appendix B** specifically responds to the factors for consideration under clause 228.

4.2.2 Other key NSW legislation and regulations

Table 4-2 provides a list of other key relevant legislation applicable to the Proposal.

Table 4-2 Other NSW legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016 (BC Act)	The BC Act establishes a framework for assessing and protecting environmental and biodiversity interests that seeks to maintain a healthy, productive and resilient environment. **Section 6.8** of this REF outlines that potential impacts to biodiversity resulting from the Proposal would not be significant.
Contaminated Land Management Act 1997 **(CLM Act)**	Section 60 of the CLM Act imposes a duty on landowners to notify the Office of Environment and Heritage (OEH), and potentially investigate and remediate land if contamination is above EPA guideline levels. Chemical testing and visual characterisation in accordance with the NSW EPA *Waste Classification Guidelines* (EPA, 2014) would be undertaken to confirm the composition and nature of excavated material that is suspected of being contaminated. Where spoil is classified as unsuitable for reuse, it would be transported to an appropriately licensed offsite facility.
Heritage Act 1977 **(Heritage Act)**	The Proposal only contains items of local heritage value and therefore is assessed within a framework under local legislation.
Roads Act 1993 **(Roads Act)**	The Proposal would require some works on Swanson Street and Mitchell Road (arterial roads) and Buckland Street and Park Street (local roads). Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of works in, on or over a public road. However, Clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads other than a Crown road to exercise the public authority's functions over that road. On this basis, consent from the City of Sydney by way of a Road Occupancy Licence or other form of licence is not required. Notwithstanding, consultation would be carried out with Transport for NSW and the Sydney Transport Management Centre to avoid impacts to traffic flow as far as reasonably practicable.

4.2.3 State Environmental Planning Policy (Infrastructure) 2007

The *State Environmental Planning Policy (Infrastructure)* 2007 (Infrastructure SEPP) is the key environmental planning instrument (EPI) which determines the permissibility of a proposal and how it is assessed under the EP&A Act. Clause 94 of the Infrastructure SEPP allows for the development of 'roads and road infrastructure facilities' by or on behalf of a public authority without consent on any land.

the *Road Transport Act 2013* Clause 93 defines 'road infrastructure facilities' as including road related areas within the meaning of (RT Act). The RT Act identifies areas open to the public and designated for use by people riding bikes as a road related area. The Proposal meets the definition of 'road infrastructure facilities' under Clause 93 of the Infrastructure SEPP.

Therefore, in accordance with Clause 94 of the Infrastructure SEPP, development consent is not required and it may be assessed as 'development without consent' under the provisions of Division 5.1 of the EP&A Act.

Part 2 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils, State Emergency Services and public authorities other than councils prior to the

commencement of certain types of development. Section 5 of this REF discusses the consultation undertaken under the requirements of the Infrastructure SEPP.

It is noted that the Infrastructure SEPP prevails over all other EPIs except where *State Environmental Planning Policy (State Significant Precincts) 2005 or State Environmental Planning Policy (Coastal Management) 2018* applies. These SEPPs do not apply to the Proposal Area or proposed activity and therefore do not require further consideration as part of this REF.

4.3 Local planning policies

4.3.1 Sydney Local Environmental Plan 2012

The Proposal is located in the Sydney LGA and is subject to The *Sydney Local Environmental Plan 2012* (Sydney LEP).

Table 4-3 summarises the relevant aspects of the Sydney LEP applicable to the Proposal.

Table 4-3 Relevant provisions of the Sydney LEP

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Tables	The majority of works to be undertaken for the Proposal would be carried out on land zoned as SP2 Infrastructure (Road), R1 General Residential, and is adjacent to RE1 Public Recreation, B4 Mixed Use and SP2 Infrastructure (Educational Establishment). The Proposal is consistent with the objectives of the R1 and SP2 zoned land on which it is located. The Proposal would not affect the land use objectives of those zones or surrounding land zones.
Clause 5.10 – Heritage conservation	Clause 5.10 of the Sydney LEP 2012 aims to: • conserve the environmental heritage of Sydney • conserve the heritage significance of heritage items and heritage • conservation areas, including associated fabric, setting and views • conserve archaeological sites • conserve Aboriginal objects and Aboriginal places of heritage significance. The Proposal is is within heritage conservation areas named 'C3 Kingsclear Road', 'C22 Erskineville Estate' and 'C1 Alexandria Estate'. A discussion of impacts to heritage is included in **Section 6.4**.
Clause 5.12 – Infrastructure development and use of existing buildings of the Crown	Clause 5.12 of the Sydney LEP 2012 does not restrict or prohibit the carrying out of any development, by or on behalf of a public authority, which is permitted to be carried out with or without development consent. The Proposal would be undertaken by a public authority (City of Sydney) and is permitted without development consent.

4.3.2 Ecologically sustainable development

The City of Sydney is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ecologically sustainable development (ESD). Defined under clause 7(4) of Schedule 2 to the EP&A Regulation, ESD is defined as including

- the precautionary principle – A lack of full scientific uncertainty should not be used to postpone measures against risk of extreme environmental degradation
- Intergenerational equity – the present generation should ensure that the health of the environment for the benefit of future generations

- Conservation of biological diversity and ecological integrity – ensuring the survival of a diversity of genes, species, populations and their communities, as well as the ecosystems and habitats they belong to
- Improved valuation, pricing and incentive mechanisms – environmental factors should be included in the valuation of assets and services.

Chapter 6.0 includes an assessment of the impact of the Proposal on a range of environmental factors, including greenhouse gas emissions and climate change. **Chapter 7.0** lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5.0 Consultation

Chapter 5.0 discusses the consultation undertaken to date for the Proposal and the consultation proposed for the future. This chapter discusses the consultation strategy adopted for the Proposal and the results of consultation with the community, relevant government agencies and stakeholders.

Engagement was undertaken for cycling connections in Alexandria and Erskineville as part of the overall Cycling Strategy and Action Plan by the City of Sydney, and summarised and reported for the City by Global Research Ltd. The objective of this engagement was to provide information including concept design to the community and allow them to have their say. The feedback informs the next steps of the project and suggestions will be incorporated into the detailed wherever practical.

The City of Sydney sought community feedback on four proposals that were available on the Sydney Your Say webpage, all of which included consultation drawings. The consultation period ran from 20 November − 18 December 2020.

The Sydney Your Say web page received 1,461 page views. Overall, 599 submitters provided feedback to the City of Sydney on the proposal:

- 589 online surveys were completed
- 10 submissions in respondents' own formats.

In the online survey, respondents were asked to provide open-ended feedback on the connections all together, or by separate area. Respondents were able to give feedback on the proposals for:

- Henderson Road, Railway Parade and Bridge Street
- Ashmore and Harley Streets
- Mitchell Road and Huntley Street
- Shared paths in Alexandria and Erskineville and changes to parking and traffic on Park Street
- Feedback on all the connections or add to your feedback.

The following sections focus on the consultation specific to the Ashmore and Harley Street cycleways. The complete Engagement Report is included in Appendix G.

5.1 Consultation requirements under the Infrastructure SEPP

Part 2, Division 1 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Clauses 13-15 and 15A provides details of consultation requirements with councils for development impacts on council-related infrastructure, local heritage, flood liable land and land within the coastal zone. As City of Sydney Council is the proponent, these clauses are regarded as considered. Clauses 15AA and 16 provides details for consultation requirements with State Emergency Services for flood liable land, and for consultation with public authorities other than councils for land under the *National Parks and Wildlife Act 1974.* Since the Proposal Area does not contain any of these characteristics, these clauses do not apply.

5.2 Consultation strategy

The consultation strategy for the Proposal was developed to encourage stakeholder and community involvement and foster interaction between stakeholders, the community and the project team. The consultation strategy that was developed, having regard to the requirements of the planning process and the City's Community Engagement Strategy, ensures that stakeholders, customers and the community are informed of the Proposal and have the opportunity to provide input.

The objectives of the consultation strategy are to:

- Provide accurate and timely information about the Proposal and REF process to relevant stakeholders

- Raise awareness of the various components of the Proposal and the specialist environmental investigations
- Ensure that the directly affected community is aware of the REF and consulted where appropriate
- Provide opportunities for stakeholders and the community to express their view about the Proposal
- Understand and access valuable local knowledge from the community and stakeholders
- Record the details and input from community engagement activities
- Build positive relations with identified community stakeholders
- Ensure a comprehensive and transparent approach.

5.3 Ongoing consultation

Should City of Sydney determine to proceed with the Proposal, the Determination Report would be made available on the TfNSW website and would summarise the key impacts identified in this REF, demonstrate how City of Sydney considered issues raised during the public display period, and include a summary of mitigation measures proposed to minimise the impacts of the Proposal.

Should City of Sydney determine to proceed with the Proposal, the project team would keep the community, and other key stakeholders informed of the process, identify any further issues as they arise, and develop additional mitigation measures to minimise the impacts of the Proposal, if required.

6.0 Environmental Impact Assessment

Chapter 6.0 of this REF provides a detailed description of the likely environmental impacts associated with the construction and operation of the Proposal. For each likely impact, the existing environment is characterized and then an assessment is undertaken as to how the Proposal would affect the existing environment.

This environmental impact assessment has been undertaken in accordance with clause 228 of the EP&A Regulation. A checklist of clause 228 factors and how they have been specifically addressed in this REF is included in **Appendix B**.

6.1 Traffic and transport

This section assesses and describes the impacts of the Proposal on traffic, transport and pedestrian and cycling access within and surrounding the Proposal Area. The assessment is based on a desktop analysis. Detailed traffic counts and modelling were not considered necessary for the Proposal.

6.1.1 Existing environment

Public transport

The nearest train station for the Proposal Area is Erskineville Railway Station which is serviced by multiple train lines that connect the area north to the CBD as well as to various train lines to the south and south-west.

For Proposal Area (Swanson Street), Erskineville Railway Station is located approximately 300 metres away from Elliot Avenue. Within the Proposal Area (Swanson Street) there is one bus stop shelter located on Swanson Street near the corner of Elliot Avenue. Adjacent to the Proposal Area (Swanson Street) there is another bus stop located on the opposite side of Swanson Street.

For Proposal Area (Mitchell Road) Erskineville Railway Station is located approximately 700 metres away from Brown Street. Adjacent to the Proposal Area (Mitchell Road) there are two bus stops located on the Mitchell Road near the corner of Brown Street and Buckland Lane.

Road network and traffic

The Project is located in an east-west corridor that connects Erskineville to the suburbs of Waterloo, Green Square and Alexandria. The Proposal Area would also connect people riding bikes from Erskineville Station with multiple main thoroughfares of George Street, Elizabeth Street, and Botany Road. Proposal Area (Swanson Street).

Within the Proposal Area (Swanson Street), the main road is Swanson Street and Copeland Street which consists of two lanes, a median strip, and a parking lane on either side. Elliot avenue at the north-western corner of Harry Noble Reserve is a smaller residential street with parking only on the Western side. Fox Avenue is a small street with parking on both sides which allows access to Erskineville Oval, Alexandria Erskineville Bowling Club and through to Ashmore Street.

Within the Proposal Area (Mitchell Road), the main road is Mitchell Road which between Brown Street and Buckland Street consists of three lanes, and a parking lane on the eastern side. Brown Street is a narrow residential one way (direction south east) laneway providing access between Suttor Street and Mitchell Road, with parking on the south-western side. Buckland Street is a wide residential street that connects Mitchell Road to Botany Road, with two lanes and parking on either side. All streets within Proposal Area (Mitchell Road) are subject to school zone traffic speeds.

Access

The Proposal Area (Mitchell Road) is used as a main thoroughfare from Sydney Park Road heading north in a direction towards the city. On a local scale, Mitchell Road located between Brown Street and Buckland Street is a main access point for schools and for residences, although Buckland Street also connects to Mitchell Road to the main thoroughfare that is Botany Street.

The Proposal may affect, but is not limited to affecting, the following users:

- Residences on Buckland Street

- Users (pedestrians, motorists, people on bikes) of Buckland Street
- Access (pedestrians, motorists, people on bikes) to educational establishments including Alexandria School, Central Sydney Intensive English High School
- Residences on Mitchell Road
- Users (pedestrians, motorists, people on bikes) of Mitchell Road
- Residences on Brown Street, Mitchell Lane and Suttor Street accessing Brown Street as a throughway
- Users (pedestrians, motorists, people on bikes) of the Local centre shops at Mitchell Road and Buckland Street, and
- Users (pedestrians, motorists, people on bikes) of Alexandria Park

The Proposal Area (Swanson Street) is used a main thoroughfare from Erskineville station and the suburbs of Newtown and Erskineville heading east towards Mitchell Road. On a local scale, Swanson Street/Copeland Street is used as a main access point to the Henry Noble Reserve and Erskineville Oval, and the shops located on the corner of Park and Swanson Street.

The Proposal may affect, but is not limited to affecting, the following users:

- Users (pedestrians, motorists, people on bikes) of Swanson Street
- Access (pedestrians, motorists, people on bikes) to educational establishments including Erskineville Public School, St Marys Catholic Primary school, other early education and care centres along Swanson Street
- Residences on Swanson Street
- Access of users (pedestrians, motorists, people on bikes) to Erskineville Park and Oval, which can be accessed from Ashmore Street as well
- Access of users (pedestrians, motorists, people on bikes) to Henry Noble Reserve
- Users (pedestrians, motorists, people on bikes) to Local centre at the corner of Swanson Street and Park Street with cafes and the Kurrajong Hotel
- Residences on Park Street, Copeland Street and Elliot Avenue
- Public Transport users of the bus stop shelter to be replaced at the corner of Elliot Avenue and Swanson Street

Kerbside use

Within the Proposal Area (Swanson Street) kerbside parking is located on Swanson Street (south). The kerb which runs alongside Henry Noble Reserve is currently used by pedestrians. Pedestrians may use the kerbside entrances to the Henry Noble Reserve located at the corner of Elliot Avenue and Swanson Street, and at Fox avenue and Swanson Street, where Project works would be conducted. A bus stop exists on the kerbside near the corner of Swanson Street and Elliot Avenue.

Within the Proposal Area (Mitchell Road) kerbside parking is located on Buckland Street and the southern side of Brown Street. The kerb along Buckland Street is fairly wide and currently used by pedestrians, although a shared pedestrian cycling path exists at the corner of Park Road and Buckland Street. The kerb along Mitchell Road (west) is currently used by pedestrians. Pedestrians may use this street to access nearby educational establishments or the local shops on the corner of Buckland Street and Mitchell Road.

6.1.2 Potential construction impacts

Public Transport

For Proposal Area (Swanson Street) the bus shelter located on the south side of Swanson Street adjacent to Elliot avenue would be removed and relocated after the proposed construction works to widen the footpath at this location. The bus shelter would be reinstated away from the park boundary

to facilitate more room for people on bikes and pedestrians to pass behind. These works would affect one bus route, the 355 which connects the area between Bondi Junction and Marrickville.

For Proposal Area (Mitchell Road) the existing bus routes on Mitchel Road would likely not be affected by the new shared path infrastructure.

Road network and traffic

During construction, traffic flows along sections of Swanson Street and Mitchell Road would be temporarily disrupted to allow for construction vehicle access and deliveries of construction materials and equipment. These disruptions may result in temporary delays for vehicles and people on bikes travelling these roads. Construction activities could potentially increase road congestion and interfere with the movements of pedestrians along footpaths through sections of the Proposal Area due to temporary and intermittent closures of footpaths for construction activities. It is not anticipated that the complete closure of the footpath adjacent to the Proposal would be necessary and therefore no significant accessibility impacts are expected.

A lane of traffic adjacent to the proposed extended footpath area at the corner of Elliot Avenue and Swanson Street would likely be closed during construction works.

Access

Within the Proposal Area (Mitchell Road) impact would affect Central Sydney Intensive English High School and Alexandria Park Community School, although construction works are likely to be outside peak hours and therefore should not affect access. A number of properties rely on Buckland Street (south) for property access and therefore might be affected by the works on this street. This may result in the loss of access to driveways for short periods, such as during resurfacing works. Businesses and residents would be notified of changes to their driveway access arrangements with the operational shared path present in front of driveway entrances. Alternative access arrangements would need to be put in place for private properties at three driveways along Buckland Street. Works on Brown Street are likely to be minimal and therefore have little to no impact on access.

Within the Proposal Area (Swanson Street) street parking and pedestrian access to Swanson Street (south) would be limited during stages of construction of the shared path on the footpath. Access to the shops located on the corner of Park and Swanson Street would be affected by noise impacts, visual amenity and accessibility. These impacts would become more prominent when construction works begin on the pavement directly on or in front of these businesses. Pedestrian access between the park and the shops on Swanson and Park Street might be limited while the pedestrian crossing is being widened. An alternative crossing is located 170 m west near St Mary's Catholic Primary School. The disruption would be short term and therefore minor.

Road pavement works would be short term and temporary, and any road closures would be limited to the extent of work area required in any one location. Where possible, a lane would be provided to allow for traffic throughput, under traffic controller supervision.

Local access impacts would be managed in accordance with the TMP. On this basis access impacts are considered to be minor and short term.

Kerbside use

The Proposal would result in temporary changes for pedestrians to the existing kerbside use along Swanson Street, Mitchell Road and Buckland Street during construction. Permanent changes would also occur due to the nature of the construction works taking place along the footpath.

In the Proposal Area (Swanson Street) pedestrian kerbside use would be temporarily unavailable and/or diverted around retail businesses located at the corner of Swanson Street and Park Street. This includes pedestrian access to 'Naked Brew' café and 'The Kurrajong Hotel' and the outdoor seating currently existing outside 'Naked Brew café', and 'Ella Guru Café'. Pedestrian kerbside use alongside the park on Swanson Street may also be limited and/or diverted during construction works.

The bus stop located on the kerb near Elliot Avenue and Swanson Street would be removed while a new kerbside extension is being constructed. During this time the bus shelter is to be temporarily relocated and reinstated at the completion of the kerbside works.

Permanent changes to the kerbside use would include the inclusion of people on bikes on the kerbside path after the shared path is installed. People riding bikes would share the kerb with pedestrians, with lines demarcating appropriate sides of the kerb for each user group.

In the Proposal Area (Mitchell Road) pedestrian kerbside use would be temporarily unavailable and/or diverted on Mitchell Road (west), and on Buckland Street (south) from the intersection with Mitchell Road until Park Road while construction takes place. Kerbside use at Brown Street is not expected to be affected as the extent of works is limited to the existing road and not on the kerbside. Kerbside access around retail businesses located at the corner of Mitchell Road and Buckland Street including any outdoor seating may also be limited and/or removed during construction works.

Permanent changes to the kerbside use would include the inclusion of people riding bikes on the kerbside path after the shared path is installed on a portion of Mitchell Road (west) and a portion of Buckland Street (south). People riding bikes would share the kerb with pedestrians, with lines demarcating appropriate sides of the kerb for each user group.

6.1.3 Potential operational impacts

Public Transport

The Proposal is likely to have a positive effect on the public transport network due to relocation of people riding bikes from the road network to the footpath. The Proposal would separate people riding bikes from motorists on Swanson Street, Mitchell Road and Buckland Street. As such the Proposal would affect positively on road space by increasing that available to other road networks such as public transport. The separation of people riding bikes from the road would also minimise safety risks regarding collisions between motorists and people riding bikes sharing space on narrow busy roads. The Proposal may encourage a modal shift from car users and public transport users to cycling. Local effects of this are that there may be less demand for local public transport services. Other effects of an increase in people riding bikes may include a demand for other facilities such as secure bicycle parking facilities at public transport stations such as Erskineville Station. Generally, the removal of bicycles from the road network would improve traffic and congestion for other road users including public transport operators. The overall impact of the Proposal is likely to be of minor positive effect on the public transport network.

Road network and traffic

The Proposal is likely to have a positive effect on the road network due to relocation of people on bikes from the road network to the footpath. The Proposal would separate people on bikes from motorists on Swanson Street, Mitchell Road and Buckland Street. The Proposal would formalise bicycle priority zones on Park Street, Elliot Street, and Brown Street. The accumulated effect of formalising cycling priority streets on low-traffic networks, and separated shared zones on main roads would increase space on Swanson Street and Mitchell Street to motorists and other road users. The separation of people on bikes from the road would also minimise safety risks regarding collisions between motorists and people riding bikes sharing busy road networks. The Proposal may encourage a modal shift from car users and public transport users to cycling. Local effects of this are that there may be less motorists using the existing road network which would alleviate road traffic. The overall impact of the Proposal is likely to be of moderate positive effect on road network.

Access

The Proposal would result in improved changes to access for people on bikes. The proposed shared paths are part of a city commitment to deliver a ‘Liveable Green Network’ of high quality, safe, and pleasant pedestrian and cycleway connections. The Proposal would connect people on bikes directly to other existing parts of the cycleway network such as the existing shared path around Erskineville Oval, the low-traffic street/bike lane with wayfinding signage on Buckland Street and other cycleways nearby. Accessibility to Erskineville Oval, Henry Noble Reserve, the local shops on the corner of Park Street and Swanson Street, Central Sydney Intensive English High School, Alexandria Park Community School, and the local shops on the corner of Mitchell Road and Buckland Street would be improved for people on bikes. The Proposal would therefore have moderate-major positive effect on accessibility for people on bikes in the local area.

The Proposal would not result in any substantial changes to access for motorists. This includes those accessing the businesses or residences fronting the Proposal Area. No car parking spaces are

planned to be removed and no permanent closures of any driveways is planned for the Proposal. The Proposal would therefore have a negligible effect on accessibility for motorists.

The Proposal would not result in any substantial changes to access for pedestrians besides the sharing of the footpath and therefore have a neutral impact on accessibility for pedestrians.

Kerbside use

The Proposal would result in changes to kerbside usage. This includes a change in the formal use of footpaths on Swanson Street, Mitchell Road and Buckland Street from pedestrian only to a shared path between pedestrians and people on bikes. The kerbside may therefore become busier with people on bikes than is currently. Kerbside use would also change at the local centre on the corner of Swanson Street and Park Street, where the Proposal seeks to install two ramps for people on bikes to access the local centre from Park Street, and vice versa. The kerbside adjacent to these shops would likely become busier due to the increased accessibility to people riding bikes from the road. The kerbside would also be altered the corner of Swanson and Elliot Avenue which would allow for additional pedestrian space behind and in front of the bus shelter, allowing both pedestrians and people riding bikes to navigate the bus stop and kerb side area safely.

The Proposal would result in substantial changes to kerbside usage along areas designated as shared zones as well as around the local centres at Swanson Street and Park Street, and Buckland Street and Mitchell Road. The overall impact would be of a neutral effect on pedestrians and moderate-major positive effect for local motorists and people on bikes.

6.1.4 Mitigation measures

The following mitigation measures are recommended to minimise traffic and transport impacts:

- During construction, appropriate traffic management measures would be implemented and maintained such as temporary speed restrictions, precautionary signs, illuminated warning devices, manual and/or electronic traffic control and provision of temporary barriers and markers to control the proposed work areas.
- The lane closure that would be required for the extended kerb construction works proposed on the corner of Elliot Avenue and Swanson Street would require traffic controlling, directing contraflow to the opposite side of the road. This arrangement would be minimised by occurring after hours or as night works, and is projected to only require one-two nights for these works.
- During construction, arrangements would be made to ensure access to businesses and other commercial or residential premises adjacent to construction areas would be maintained at all times
- During construction affected businesses and the occupants of other commercial and residential premises would be notified in relation to any temporary access restrictions or limitations
- Business owners and residents would be informed of all changes in kerbside use. This consultation would outline the locations of any alternative areas of parking or loading in nearby streets and in off-street locations in accordance with the kerbside usage strategy
- Road occupancy licences would be obtained from TfNSW Transport Management Centre for all construction activities. Major CBD and city wide events would be considered when applying for road occupancy licences and when scheduling construction activities
- TfNSW Transport Management Centre would ensure that no significant conflicts between construction activities and major events in the city occur
- A communication strategy would be implemented for people riding bikes that would include establishing information signs and maps to inform people of changes to cycleways and shared paths within Sydney's inner-city suburbs. As part of the strategy, communication signs and material would be strategically located along major bike riding travel routes to clearly communicate proposed and ongoing changes.
- Where possible steps should be taken to minimise risk between pedestrians and people on bikes at this intersection, especially during heavy pedestrian traffic times before and after school hours.

- New line markings would help to offset negative impacts on pedestrians by demarcating footpath areas for people on bikes and pedestrians
- Building occupiers would be notified in advance of all temporary closures, though access for emergency vehicles would be provided at all times.

6.2 Noise and vibration

A noise and vibration assessment was produced for the Mitchell Road, Buckland Street, and Swanson Street shared path on the 6 October 2020 using the RMS noise calculator tool.

6.2.1 Existing environment

The NSW DECC (2009) has prepared an Interim Construction Noise Guideline (ICNG) that has been developed to assist with the management of noise impacts, rather than to present strict numeric noise criteria for construction activities.

The recommended standard hours for construction works prescribed by the ICNG are as follows:

- Monday to Friday, 7 am to 6 pm
- Saturday, 8 am to 1 pm
- Sunday and Public Holidays, no work.

The Proposal would primarily be carried out during the day, with work outside normal work hours only undertaken if works cannot be carried out during the daytime period. Work along footpath areas would generally be carried out during the day time and would include the closure of the traffic lane adjacent to kerb, whilst other work on the road such as grinding and line marking, or work required at intersections or in heavily congested areas would generally be carried out during night time. Generally, noisy work (such as jackhammering) would be carried out during standard work hours and less noisy (such as pavement work) work may then continue throughout the night, if required.

Where work is planned to extend over more than three consecutive nights, potential sleep disturbance impacts should be considered. For the assessment of these potential impacts, the ICNG refers to the *NSW Environmental Criteria for Road and Traffic Noise*.

The Proposal is situated in an inner-city suburb to the south of Sydney. As such, the existing environment is generally of low-moderate noise level during the day and night. The major noise sources include traffic (both local and distant), pedestrians, business operations, educational facilities, sports, and entertainment venues. As a result, most nearby receivers would not be accustomed to the background noise levels required by the proposed works.

The following sensitive receivers have been identified in close proximity to the work and therefore would have the highest potential to be affected:

Nearest Residential Receivers	
Proposal Area (Swanson Street)	**Proposal Area (Mitchell Road)**
Residential receivers along Swanson Street between Fox avenue and Elliot avenue	Residential receivers on Buckland Street and Mitchell Road
Commercial receivers at both corners of Swanson and Park Street located on or adjacent to proposed kerbside work, especially outdoor seating venues	Commercial receivers at the corner of Buckland and Mitchell Road located on or adjacent to proposed kerbside work, especially outdoor seating venues
Sensitive receivers at SDN Erskineville Children's Education (corner of Swanson Street and Clara Street) approximately 40 metres from proposed work	Sensitive receivers at Alexandria Community School (located on Buckland Street) adjacent to postposed works
Sensitive receivers at St Mary's Catholic Primary School (on Swanson Street) approximately 120 metres away from proposed work	Sensitive receivers at Central Sydney Intensive English High School (located on Mitchel Road) approximately 25 metres from proposed work

Nearest Residential Receivers	
Proposal Area (Swanson Street)	**Proposal Area (Mitchell Road)**
Sensitive receivers using Erskineville Oval located approximately 115 metres from the proposed work	

6.2.2 Potential construction impacts

Construction noise

A distance-based (scenario) assessment type was selected for this proposal to assess the construction noise impacts. The assessment was carried out on the 6 October 2020. As the nosiest activity in the Proposal, the 'paving and asphalting' scenario was used in the assessment to determine noise impacts. 'R3' background noise environment was selected based on the existing road volumes in this location.

The table below provides the background noise levels (also referred to as Rating Background Level (RBL)) and noise management levels.

Table 6-1 Noise Area Categories

Noise Area Category		R3 (dB)
RBL or LA90[1] Background level (dB(A))	Day	50
	Evening	45
	Night	40
LAeq(15minute) Noise Management Level[2] (dB(A))	Day	60
	Day (OOHW)	55
	Evening	50
	Night	45

Based on the assessment, it has been determined that construction noise may be audible within a 180 metre radius of the proposed works. Within the assessment, two noise catchment areas (NCAs) were defined based on proximity to proposed works. NCA1 captures areas within a catchment of 35 metres to the Proposal Area, while NCA2 captures areas between 35 to 180 metres from the Proposal Area.

The results below show the noise management levels (NML, dB(A)) for day and evening works, which are based on noise background levels from a R3 background noise environment. These are presented against predicted noise levels based on distance to the paving and asphalting equipment noise (dB(A)). The results of the construction noise assessment also propose certain mitigation measures to adopt.

The areas affected by construction noise can be seen in **Figure 6-1** below.

Figure 6-1 Construction noise assessment map

The results of the construction noise assessment are summarised below.

Table 6-2 Catchment distances affected by construction noise

Catchment distances [Commercial receiver in square brackets]	Day		
	NML, dB(A)	Predicted noise levels, dB(A)	Recommended additional mitigation measures
NCA1 [Commercial] (20m) – in line of sight	60	75	**N**, PC, RO
NCA1 (20m) – in line of sight	60	75	**N**, PC, RO
NCA1 (35m) – in line of sight	60	70	**N**

Catchment distances [Commercial receiver in square brackets]	Night		
	NML, dB(A)	Predicted noise levels, dB(A)	Recommended additional mitigation measures
NCA1 (35m) – in line of sight	45	70	AA, **N**, PC, SN, **R2**, DR
NCA2 (35m) – behind rows of buildings	45	60	**N**, PC, SN,**R2,** DR
NCA2 (115m) – behind rows of buildings	45	50	**N**,**R2**, DR
NCA2 (180m) – behind rows of buildings	45	45	**N**

Not all additional mitigation methods have been applied to the Proposal. Based on a review of additional mitigation measures and their application to the Proposal, the additional mitigation measures ‘N’ and ‘R2’ (in bold text) are recommended as feasible and reasonable to apply to this Proposal. These are defined below in section

Vibration

Sources of ground vibration associated with the Proposal were expected to be minor. Some potential for ground vibration exists where vibration intensive equipment such as vibratory rollers, jackhammers or ‘wacker packers’ are required during demolition activities. However, the proposed equipment would be small in size and construction periods would be short.

Table 6-3 provides a guide for recommended safe working distances for typical vibration intensive plant and equipment. These safe working distances presented apply to cosmetic damage of typical buildings under typical geotechnical conditions.

Table 6-3 Recommended Safe Working distances for vibration intensive works

Plant	Specification	Safe working distance		
		Cosmetic Damage (BS 7385) (metres)	Cosmetic damage (DIN 4150) Heritage and other sensitive structures (metres)	Human Response (BS 6472) (metres)
Vibratory roller	1 – 2 tonnes	5	14	15 – 20
	2 – 4 tonnes	6	16	20
	4 – 6 tonnes	12	33	40
Small hydraulic hammer	5 – 12 tonne excavator	2	2	7
Jackhammer / 'Wacker Packer'	Hand held	1 (nominal)	-	Avoid contact

Source: TfNSW Construction Noise Strategy, 2012

Vibration effects would be dependent on the type of machinery used and proximity to certain types of buildings. Further vibration assessment would be ascertained in a construction noise and vibration management plan (CNVMP).

6.2.3 Potential operational impacts

Over time, the development of the Proposal would likely result in a reduction in the number or frequency of vehicles travelling along Swanson Street, Mitchell Road, and the surrounding streets in the Proposal Area. This change in transport mode would result in a major reduction in existing sources of vibration in the area. Therefore, no operational vibration impacts were considered likely to occur at the new shared path location and as such operational vibration was not considered further in this assessment.

6.2.4 Mitigation measures

The following mitigation measures are recommended to minimise potential noise and vibration impacts:

- Specific additional mitigation measurements as identified in the noise assessment:
  - **Notification (N) -** Letterbox drops for receivers within a 180 m radius. Notifications should detail work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night time period, any operational noise benefits from the works (where applicable) and contact telephone number. Notification would be sent a minimum of 7 calendar days prior to the start of works
  - **Respite Period 2 (R2)** – Night-time construction noise should be limited to two consecutive nights except for where there is a Duration Respite. For night work these periods of work should be separated, be not less than one week and no more than 6 evenings per month
- Prepare a construction noise and vibration management plan (CNVMP). The CNVMP would be a sub-plan of the CEMP and as a minimum it would:
  - map the sensitive receiver locations including residential properties
  - a work program developed in consultation with TfNSW that would manage night noise impacts
  - include safeguards and management measures to manage out of hours working
  - include an assessment to determine potential risk for activities likely to affect receivers, including for activities undertaken during and outside of standard working hours
  - include a process for assessing the performance of the implemented safeguards and management measures

- Where work outside standard hours are unavoidable due to traffic, technical and/or safety constraints, a noise management plan for works outside normal hours would be developed. The plan would include works to be conducted, noise assessment for the proposed works in accordance to EPA requirements and consolation process
- Where work is planned to extend over more than three consecutive nights, potential sleep disturbance impacts should be considered. For the assessment of these potential impacts, the ICNG refers to the *NSW Environmental Criteria for Road and Traffic Noise*.
- Affected receivers would be notified ahead of time of the likely activities, noise impacts and duration of this work
- Nearby receivers would be notified of any work in advance of the start of construction. This is essential for residential receivers potentially affected by night time work
- A community complaints phone number would be established and advertised prior to works commencing and be available during work periods. The community complaints line would be established for any complaints or queries regarding construction
- Where reasonable and feasible rubber tracked or wheeled equipment would be used instead of standard, steel tracked plant
- Plant would be turned off when not in use
- The use of road plates would be avoided where reasonable and feasible. If their use is necessary, they would be properly installed and maintained
- The work site would be arranged to minimise the use of movement alarms on vehicles and mobile plant
- Where safety concerns can be adequately managed, the use of squawker, broadband or visual reversing alarms would be considered, rather than traditional beeper styles
- The use of equipment or methods that generate impulsive noise, particularly during night time hours would be avoided. These include dropping materials from a height, loading/unloading of trucks and metal on metal contact
- Noise monitoring would be considered in response to complaints
- A complaints handling procedure would established and implemented
- Implement noise containment measures and temporary noise barriers where feasible and reasonable where it is determined that the work would have an unreasonable adverse impact on the surrounding community. Use the number of received community complaints as a measure of impact and conduct noise monitoring to determine whether the generated noise is excessive
- The community will be informed of key dates and updated as works progress.
- Should the works require the use of equipment that generates vibration within the minimum distances specified in **Table 6-3**, a Vibration Management Plan would be included alongside the Construction Environmental Management Plan (CEMP), and would include as a minimum the following:
  - where building damage vibration impacts may be felt, building inspections and site-specific vibration testing would be considered
  - where human comfort vibration impacts may be felt, the use of alternative methods for construction work would be investigated
  - the smallest plant required to undertake the construction work would be used

– where heritage or vibration sensitive premises are located within 50 metres of the worksite, building inspections and site specific vibration testing would be considered.

6.3 Landscape and visual impacts

6.3.1 Existing environment

The Proposal Area is located within a mixed environment comprised of residential, industrial, recreational and commercial land use in one of Sydney's inner-city suburbs.

At the Proposal Area (Swanson Street) there exists a large area of greenery provided by Harry Noble Reserve used for recreational sporting activities. The urban greenery in this area also includes a number of trees alongside Swanson Road. The Proposal Area (Swanson Street) also contains a fairly busy road (Swanson Street) mainly used for car traffic. The low-medium density residential and mixed urban environment which consists of mainly townhouses, a few cafés, a bar, shops and schools.

The Proposal Area (Mitchell Road) is similarly surrounded by an urban environment mainly comprised of low-medium density residential buildings including town houses, multi-dwelling housing, neighbourhood shops and local schools. The Proposal Area (Mitchell Road) is also tree-lined along Mitchell Road, Buckland Street and Brown Street which creates a suburban feel. Adjacent to the Proposal Area is Alexandria Park, which adds to the urban greenery in the neighbourhood.

6.3.2 Potential construction impacts

The construction of the Proposal would temporarily change the appearance of the Proposal Area streets implicated as the works progress. This change would arise via the introduction of:

- Construction materials
- Hoarding
- Removed sections of the road
- Operation of plant and equipment.

While there are properties along the routes that are subject to construction works, construction activities are not a component of the street that are considered to contribute to its character and appearance. The sight of construction works, which includes various barriers to restrict public access would be obvious to both permanent and visual receivers. However, construction as a result of the Proposal would not form a permanent visual component of the streetscape and is temporary in nature. Given the works would be temporary and suitable mitigation measures would be implemented, the impact of construction works upon the visual landscape is considered to be minor.

In addition to the works outlined above, temporary lighting would be required for evening and night time construction works. Lighting would be generated from lighting towers, as the existing street lighting would not provide the necessary light for works to be carried out safely and appropriately. Lighting towers have the potential to spill light into adjacent areas, particularly building uses closer to street levels. The overall effect of the lighting towers, particularly on nearby residential buildings is considered to be a low-moderate negative impact.

6.3.3 Potential operational impacts

The visual appearance of the Proposal Area would be permanently changed as a result of:

- Introduction of new shared paths on Swanson Street, Mitchell Road and Buckland Street
- Introduction of a raised pedestrian and bicycle crossing at the intersection of Swanson Street and Park Street
- Introduction of a new continuous footpath treatment on Fox Avenue at the intersection with Swanson Street/Copeland Street
- Expansion of the kerbside located on the corner of Swanston Street and Elliot Avenue
- Altered traffic lane markings and arrangements
- Removal of concrete kerbs

- Alteration of existing intersection arrangements
- New street signage
- Widened footpaths.

The introduction of the shared path and other street components would permanently change the visual appearance of the Proposal Area. Changes to the visual amenity of the Proposal Area are considered to have a negligible impact as generally the elements fit within an urbanised street environment and are not visually intrusive. Over time, the perceived newness of the Proposal would recede and blend more consistently with unchanged streetscape elements.

The Proposal would also result in minor benefits to the visual environment due to the new pavements. The presence of the shared path may also encourage a shift in transport modes used for works and residents in this area towards cycling. This would further reduce the number of vehicles and improve the overall streetscape.

6.3.4 Mitigation measures

The following mitigation measures are recommended to minimise the visual impacts:

- Construction lighting is to be positioned such that light spill on neighbouring properties is minimised and that it is turned off when not in use and safe to do so
- The layout, directional positioning and types of lighting selected to minimise impacts are to be specified by the construction contractor in the CEMP
- A high level of housekeeping would be maintained by ensuring that the work site is kept in a clean and tidy condition, with appropriate areas designated for storage of waste materials
- Groundcover disturbed during construction would be re-established as soon as practical
- Waste materials must be removed from site regularly
- Design of new elements would be designed in accordance with *Public Domain Manual* (City of Sydney, 2017) as applicable.

6.4 Non-Indigenous heritage

This section assesses and describes the impacts of the Proposal on non-Indigenous heritage within and surrounding the Proposal Area. This assessment is based on a desktop analysis of the relevant heritage registers. The Proposal Area includes items of State heritage significance under the NSW State Heritage Register and local heritage significance under the Sydney LEP and Section 170 Heritage and Conservation Register.

6.4.1 Existing environment

A search of the following heritage registers was undertaken in September 2020 to identify any potential non-Indigenous heritage items located within the Proposal Area. This included a search of the following databases:

- Australian Heritage Places Inventory
- Commonwealth EPBC Heritage List
- NSW State Heritage Register (SHR)
- Section 170 Heritage and Conservation Registers
- City of Sydney Local Environmental Plan 2012
- Sydney Archaeological Zoning Plan (AZP).

Part 2 of Schedule 5 of the Sydney LEP indicates that the proposed Proposal Area is located fully within Kingsclear Road Heritage Conservation Area, Erskineville Estate Conservation Area and Alexandria Park Conservation Area.

There are no Commonwealth, National, or World Heritage areas within the Proposal Area. Heritage items are identified in **Table 6-4**. These can be seen on **Figure 6-2**.

Figure 6-2 Proposal Area and LEP Heritage Listed Items

Table 6-4 Non-aboriginal heritage items surrounding the Proposal Area

Heritage Item Location	Heritage Item	Item Number	Location	Relation to Proposal Area
City of Sydney Council Heritage Conservation LEP	Kingsclear Road Heritage Conservation Area	LEP Item no C3	Between Railway Parade, Hendersen Road, Mitchell Road, Copeland Street, Swanson Street, Ada Lane, and southern boundary of 107-125 Railway Parade and Sydney Street	**Within and adjacent** to Proposal Area along Swanson Street (north), Park Street, Brown Street and Mitchell Road (west)
	Erskineville Estate Conservation Area	LEP Item no. C22	Bounded by Swanson/Copeland Street, Henderson Road, Ashmore Street and Binning Street	**Within and adjacen**t to Proposal Area along Swanson Street and Copeland Street (south) to the north of Harry Noble Reserve
	Alexandria Park Conservation Area	LEP Item no C1	Henderson Road (incl. no. 12), Wyndham St (incl. nos. 118-120), Power Ave, Park Rd,	**Within and adjacent** to Proposal Area along Buckland Street and corner of Buckland Street and Mitchell Road

Heritage Item Location	Heritage Item	Item Number	Location	Relation to Proposal Area
			Buckland Street (incl. Nos. 1-23) and Mitchell Road	
	Outside the Proposed Works Area			
	Terrace group including interiors	LEP Item no. 113	30–33 Copeland Street (Lots 2–4, DP 549113; Lot 163, DP 1100538)	Approximately 20 metres away from proposed works on the southern side of Copeland Street,
	Cottage including interior	LEP Item no. I19	54 Jennings Street, (Lot 46, Section C, DP 2307)	Located approximately 50 metres away from f Swanson Street (north)
	Terrace group including interiors	LEP Item no. I25	79–89 Mitchell Road, (Lots 1–6, DP 439703)	**Adjacent** to Brown Street and Mitchell Road proposed works. Note: minor painting works only and upgrade to existing light.
	Terrace group including interiors	LEP Item no. I26	91–95 Mitchell Road (Lots 1–3, DP 717307)	Located approximately 30 metres away from the Proposal Area (corner of Brown Street and Mitchell Road)
	Alexandria Park including entrance gates, landscaping and grounds	LEP Item no. I11	Buckland Street, Land in MS 246.2030.	**Adjacent** to Proposal Area works on Buckland Street and Park Road.

6.4.2 Potential construction impacts

Heritage items located adjacent to the Proposal Area are likely to experience indirect impacts as a result of the proposed construction activities. Indirect impacts refers to resulting in changes to the setting or curtilage of heritage items or places, historic streetscapes or views

The impacts to non-Indigenous heritage items are summarised in **Table 6-6** and detailed in the following section.

For the purpose of this assessment, impacts on heritage are identified as either:

- Direct impacts – resulting in the demolition or alteration of fabric of heritage significance
- Indirect impacts – resulting in changes to the setting or curtilage of heritage items or places, historic streetscapes or views.

Specific terminology and corresponding definitions are used in this assessment to consistently identify the magnitude of the project's direct, indirect or potentially direct impacts on heritage items or archaeological remains. The terminology and definitions are based on those contained in guidelines produced by the International Council on Monuments and Sites (ICOMOS) and are shown in **Table 6-5.**

Table 6-5 Terminology for assessing the magnitude of heritage impact

Magnitude	Definition
Major	Actions that would have a long-term and substantial impact on the significance of a heritage item. Actions that would remove key historic building elements, key historic landscape features, or significant archaeological materials, thereby resulting in a change of historic character, or altering of a historical resource. These actions cannot be fully mitigated.
Moderate	This would include actions involving the modification of a heritage, including altering the setting of a heritage item or landscape, partially removing archaeological resources, or the alteration of significant elements of fabric from historic structures. The impacts arising from such actions may be able to be partially mitigated.
Minor	Actions that would results in the slight alteration of heritage buildings, archaeological resources, or the setting of an historical item. The impacts arising from such actions can usually be mitigated.
Negligible	Actions that would results in very minor changes to heritage items.
Neutral	Actions that would have no heritage impact.

Table 6-6 Potential construction impacts to local heritage items as a result of the Proposal

Heritage Item	Description	Heritage impact assessment
Kingsclear Road Conservation Area ***Sydney LEP Item No. C3***	The Kingsclear Road Heritage Conservation Area has historic significance as a Victorian small lot subdivision that developed in association with the Eveleigh Railway Yards. The area predominantly comprises a range of one and two storey working class housing of the Victorian period including terraces, cottages and shops, together with development of Federation and inter-war periods. The industrial development illustrates a later overlay reflecting the growing importance of the area as an industrial centre in the early twentieth century. It comprises a diverse range of development predominantly residential, reflecting the major stages of development, namely the original grants, the subdivision of various estates in the late nineteenth century, consolidation in the early twentieth century. The surviving Victorian building stock comprises predominantly one and two storey terrace houses, shops and cottages, with some later (Federation period) terraces and shops of a similar scale and form. Inter- war period development includes public housing, industrial buildings, a hotel and several public buildings near the station. The area includes a former nursery.	The heritage value mainly pertains the area's Victorian and Federation architecture as well as Inter-war buildings including public housing, industrial buildings, a hotel and several public buildings near the railway station. There would be minor to negligible direct impacts to this heritage area as works are only limited to the footpath and kerbside structures. Works pertaining to the footpath located on the corner of Park and Swanson street would exercise caution in proximity to shop buildings and the Kurrajong Hotel. Indirect impacts to conservation area are considered to be minor. There is potential for nearby buildings to experience vibration levels above the cosmetic damage screening criteria as a result of construction activities including utility and road furniture relocation. Further condition assessment of the heritage item and vibration monitoring (if required) would be completed.

Heritage Item	Description	Heritage impact assessment
Erskineville Estate Conservation Area ***Sydney LEP Item No. C22***	The Conservation Area is of local historical significance for being dedicated as Macdonaldtown Park in 1885 and for the later development of the western section of the park for the Erskineville Housing Scheme. The housing scheme was in response to the Housing Improvement Act of 1936 and 1937 and was an important precursor to work undertaken later by the NSW Housing Commission in the post World War II period. The housing scheme is rare example of public housing erected during the inter - war period and the only major scheme to have been built by the Housing Improvement Board. The Erskineville Housing Scheme has important associations with prominent and influenctial architects, and is a reflection of inter-war attitudes to social issues and concepts. Similarly, the Lady Gowrie Child Centre, which has close visual and historical connections with the Erskineville Scheme, remains as Sydney's example of the six centres built in the Australia's six capitals in the 1930 and provides evidence of the attitudes towards the care of children in the inter-war period. Erskineville Park has high local aesthetic and social significance as an active and passive open space in the area and is integral to the surrounding streetscape. It also provides a civic focus.	The heritage value mainly pertains to the provision of public housing during the post-war era and a symbol of attitudes towards social issues. It also pertains to the social and local significance of parkland as providing open space and an aesthetically pleasing streetscape. There would be minor to negligible direct impacts to this heritage area as works are only limited to the footpath and kerbside structures on Swanson Street (north). In addition, cycling is considered to contribute to the active open space usage in the area. Indirect impacts to the conservation area are considered to be minor. Further condition assessment of the heritage item and vibration monitoring (if required) would be completed.
Alexandria Park Conservation Area ***Sydney LEP Item No. C1***	The Alexandria Park Conservation Area is significant for its ability to demonstrate the growth of the municipality of Alexandria in the second half of the nineteenth century and the first half of the twentieth century. The area developed in association with the industrial growth of Waterloo and the establishment of the Eveleigh Railway and Goods Yards, providing housing for workers. The housing stock reflects successive subdivisions of the Coopers freeholds and Park View Estate. The industrial development illustrates a later overlay reflecting the growing importance of the area as an industrial centre in the early	The heritage value mainly pertains the area's character as an industrial estate, housing the working-class population in the Victorian/Federation era and Alexandria Park as a key community infrastructure. There would be minor to negligible direct impacts to this heritage area as works are only limited to the footpath and kerbside structures. In addition, cycling is considered in contributing to the character as key community infrastructure. Indirect impacts to the conservation area are considered to be minor. There is potential for some Victorian houses on Buckland Street to experience

Heritage Item	Description	Heritage impact assessment
	twentieth century. Alexandria Park provides a focus for the community.	vibration levels above the cosmetic damage screening criteria as a result of construction activities including utility and road furniture relocation. Further condition assessment of the heritage item and vibration monitoring (if required) would be completed.
Terrace group including interiors ***LEP Item no. 113***	30-33 Copeland Street is of historical significance as a group of late Victorian residential development in Alexandria. It is of aesthetic significance as a group of intact Filigree terraces contributing to the streetscape.	There would be minor to negligible direct impacts to this heritage area as works are only limited to the footpath and kerbside structures. There is potential for some Victorian houses on Copeland Street/Swanson Street to experience vibration levels above the cosmetic damage screening criteria as a result of construction activities including utility and road furniture relocation. Further condition assessment of the heritage item and vibration monitoring (if required) would be completed.
Cottage including interior ***LEP Item no. I19***	Of aesthetic and historical significance as a good example of a Federation detached working class cottage associated with the adjacent early local industries and the Eveleigh Railway Workshops. It has high integrity as part of a unique small group of weatherboard buildings in the area and for its own intact form and detailing.	There would be minor to negligible direct impacts to this heritage area as works are only limited to the footpath and kerbside structures. There is potential to experience vibration levels above the cosmetic damage screening criteria as a result of construction activities including utility and road furniture relocation. Further condition assessment of the heritage item and vibration monitoring (if required) would be completed.
Terrace group including interiors ***LEP Item no. I25***	78-89 Mitchell Road is of historical significance as early residential development after the land subdivision. They have aesthetic significance, as a group of intact single storey Victorian terraces, which contribute to the streetscape and character of the local area.	There would be minor to negligible direct impacts to this heritage area as works are only limited to the footpath and kerbside structures. There is potential for some Victorian houses on Mitchell Road to experience vibration levels above the cosmetic damage screening criteria as a result of construction activities including utility and road furniture relocation. Further condition assessment of the heritage item and vibration monitoring (if required) would be completed.
Terrace group including interiors	91-95 Mitchell Road is of local historical and aesthetic significance. It comprises three terraces built at the turn of 20th century as workers housing likely to be associated with the nearby factories.	There would be minor to negligible direct impacts to this heritage area as works are only limited to the footpath and kerbside structures.

Heritage Item	Description	Heritage impact assessment
LEP Item no I26	They contribute to the character of the streetscape.	There is potential for some Victorian houses on Mitchell Road to experience vibration levels above the cosmetic damage screening criteria as a result of construction activities including utility and road furniture relocation. Further condition assessment of the heritage item and vibration monitoring (if required) would be completed.
Alexandria Park including entrance gates, landscaping and grounds ***LEP Item no. I11***	Alexandria park is a designed open space with retains its essential layout as a product of the late Victorian era in Sydney catering for the local community of predominantly working class. The natural of the layout of the Park is expressed as equal portions of passive and active areas with a focus on the site once occupied as a cricket oval and now football fields. The design and choice of predominantly Ficus species is associated with the influence of the successive Directors of the Sydney Botany Gardens: Charles Moore, Joseph Henry Maiden and Edward Ward. The park contains three commemorative gateways associated with local politicians and members of Alexandria Municipal Council. The park currently is still a prominent recreation venue for the local public.	There would be minor to negligible direct impacts to this heritage area as works are only limited to the footpath and kerbside structures in proximity to but not adjacent to Alexandria Park. Further condition assessment of the heritage item and vibration monitoring (if required) would be completed.

Temporary changes affecting visual amenity are likely to affect non-indigenous heritage during the construction phase. These affects include temporary installation of tree protection structures and temporary stationing of machinery. Temporary installations of 1.8m high tree protection fences would occur around two trees on Buckland street, four three trees on Swanson Street and one on Fox avenue. In addition, construction machinery would likely affect the landscape character and visual amenity temporarily.

6.4.3 Potential operational impacts

During operation, impacts to non-Aboriginal heritage items would be largely experienced as changes to landscape character and visual amenity.

6.4.4 Mitigation measures

The following mitigation measures are recommended to minimize impacts to non-Indigenous heritage items:

- Further condition assessments for the identified heritage items would be conducted prior to the start of construction. Additional vibration assessment would be conducted if it is deemed required by the assessor
- If any inadvertent damage occurs to heritage items in the vicinity of the study area due to vibration or other works, the damage must be reported immediately to Manager and the relevant heritage specialists. Damage is to be made good in accordance with specialist heritage advice
- In order to prevent inadvertent impacts to significant fabric during the proposed development, Protection Zones would be required in all areas where construction works abut a heritage

item. Protection Zones would be established within a minimum of one metre around heritage items (where feasible) or comprise of protective pads being placed on the item

- All relevant construction staff, contractors and subcontractors must be made aware of their statutory obligations for heritage under the NSW *Heritage Act 1977* and best practice as outlined in The Burra Charter (Australia ICOMOS 2013) to ensure no archaeological remains or heritage fabric are affected during the proposed works without appropriate mitigation measures in place. This would be implemented through a heritage induction carried out prior to works commencing and throughout the works program
- In the event that any unanticipated archaeological deposits are identified within the Proposal Area during construction, appropriate procedure would be followed and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the City of Sydney Proposal Manager and the City of Sydney environmental officer so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and DPIE. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.

6.5 Indigenous heritage

This section assesses and describes the impacts of the Proposal on Indigenous heritage within and surrounding the Proposal Area. A desktop assessment was undertaken to determine whether the Proposal has the potential to affect Aboriginal cultural heritage (including indigenous sites, objects and places as defined under the NPW Act) and if further assessment or investigation is required.

6.5.1 Existing environment

The Proposal Area is located within the City of Sydney LGA and Metropolitan Local Aboriginal Land Council (LALC). The Metropolitan LALC covers a large proportion of the Sydney Basin from the Georges River in the south to Yengo National Park in the north. The Gadigal people were the original inhabitants of the land now encompassed by the City of Sydney LGA.

A search of the Aboriginal Heritage Information Management System (AHIMS) was conducted on 21 September 2020. The AHIMS searches did not identify any Aboriginal heritage items within or adjacent to the Proposal Area.

The Proposal Area does not contain any landscape features that indicate the presence of Indigenous heritage objects and the cultural heritage potential of the Proposal Area and surrounds appears to be significantly reduced due to past disturbance.

6.5.2 Potential construction impacts

Direct or indirect impacts to items of Indigenous cultural heritage are unlikely as a result of the Proposal, as:

- No Aboriginal sites have been previously identified within the Proposal Area
- The Proposal Area has previously undergone moderate landscape modification and a moderate level of disturbance from urban development.

The Proposal Area has been previously disturbed as a result of the original construction of footpaths and surrounding residential and commercial developments. These previous developments have resulted in removal or disturbance to the upper layers of the natural soil profile which is where indigenous heritage items are likely to have been found. There is clear evidence that the Proposal Area has also been subject to past disturbance with the introduction of fill materials, levelling, installation of utilities and services (both subsurface and above ground) and roadside landscaping. Therefore, there is a low likelihood that the Proposal would affect any previously unidentified culturally sensitive items within the Proposal Area.

The Proposal may require some deeper excavations in localised areas along the corridor and in adjacent land for the relocation of road furniture and utilities. This has the potential to extend below previously modified areas. If potential Aboriginal objects are encountered during construction for the Proposal, the Unexpected Finds Procedure would be implemented.

6.5.3 Potential operational impacts

Once operational, the Proposal would not affect Indigenous heritage.

6.5.4 Mitigation measures

The following mitigation measures would apply to the Proposal:

- All construction staff would undergo an induction in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.
- If unforeseen Indigenous objects are uncovered during construction, appropriate procedure would be followed and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the City of Sydney Proposal Manager and City of Sydney environmental officer so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the DPIE and the Local Aboriginal Land Council.
- If human remains are found, work would cease, the site secured and the NSW Police and the DPIE notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.

6.6 Contamination, landform, geology and soils

6.6.1 Existing environment

Landform, geology and soils

Reference to the 1:100,000 Geological Map of Sydney identified that the underlying geology of the Proposal Area is mainly underlain by Medium to fine-grained “Marine” sand with podsols.

The elevation of the Proposal Areas are relatively flat with slight variations. The Proposal Area (Swanson Street) slopes gently downwards from the Erskineville station on Swanson Street through to Mitchell Road. The Proposal Area (Mitchell Road) slopes very gently upward towards Buckland Street, with some dips in elevation along the way.

The soil landscape of the Proposal Area is located within the boundaries of the Tuggerah landscape (eSPADE, 2020), which typically have a low-medium capability for urban development although most of the land development in this area has been urban residential and heavy industry. The Tuggerah landscape mainly comprises of gently undulating plains and rolling undulating rises of broad, level to very gently inclined, swales and dunes. Soils are typically deep, Podzols on dunes or Podzols/Humus Podzol integrades on swales. Limitations of this landscape include wind erosion hazard, and non-cohesive soils and other water-based limitations.

Above the recorded soil and geological landscape, the Proposal Area is likely to consist of human-imported fill material, concrete and road base as a result of the ongoing construction and maintenance of the road.

Acid sulfate soils

Acid sulfate soil (ASS) risk maps have been obtained from the Sydney LEP. Based on the ASS map, the Proposal Area is located on land mapped as containing Class 5 ASS. According to the Department of Planning, Industry and Environment’s Environment Planning Instrument – Acid Sulfate Soils, ‘Class 5: Acid sulfate soils are not typically found in Class 5 areas. Areas classified as Class 5 are located within 500 metres on adjacent class 1,2,3 or 4 land” (Department of Planning, Industry and Environment, n.d). The Proposal is located near Class 3 ASS which exist around Alexandra Canal.

Contamination

A search of the NSW EPA Contaminated Land Register on 21 September 2020 identified no contaminated sites within or nearby the Proposal Area. The Proposal Area has not been declared as significantly contaminated and is not regulated under the CLM Act. The nearest contaminated site is

located approximately 500 metres away (Alexandria Canal Sediments) and therefore it is unlikely to affect the Proposal.

Given the urbanised nature of the Proposal Area in this location, there is potential for contaminants to be present within the soils underlying the road. The construction and ongoing maintenance of the roadway would likely have involved the introduction of fill and potential spills of ash, fuel, oil and other chemicals.

6.6.2 Potential construction impacts

Soil disturbance, erosion and sedimentation

The Proposal would involve excavation and other earthworks associated with the proposed shared path. If not adequately managed, these works could result in the following risks:

- Erosion of exposed soil and stockpiled materials
- Dust generation from excavation and vehicle movements over exposed soil
- Increase in sediment loads entering the stormwater system and/or local runoff.

The risk of the above impacts occurring is increased during high wind, rainfall events and on work situated on or adjacent to downward sloping surfaces. These risks have implications upon other environmental factors including biodiversity, water quality and air quality. Where sediment loads in local waterways are increased as a result of erosion of materials, it would alter the existing water quality conditions, which may result in negative impacts upon aquatic flora and fauna.

Inadequately covered or stockpiles that are not watered-down may result in increased dust in the local area during high wind events. Increased dust in the area surrounding the works may have nuisance impacts upon surrounding receivers.

With no mitigation measures in place, and in inclement weather conditions involving rain and/or high-velocity wind, the impact of those risks is considered to be a temporary, moderate negative impact. However, through the implementation of the mitigation measures listed in **Section 6.6.4**, despite weather conditions, the risks associated with soil disturbance, erosion and sedimentation at the Proposal Area is considered to be low.

Acid Sulfate Soils

It is unlikely that ASS would be encountered during the proposed works construction phase. The area has been previously disturbed as a heavily urbanised environment . The depth of excavation would be minimal and a maximum of less than 1.5 metres and associated with the installation of footing, signage, storm water drainage, and a bus shelter. According to the Department of Planning, Industry and Environment's Environmental Planning Instrument – Acid Sulfate Soils, Class 3 ASS are likely to be found beyond 1 metre below the natural ground surface. Therefore the risk of encountering acid sulfate soils would be unlikely. The presence of ASS within the Proposal Area has not been confirmed through field testing, notwithstanding, given the classification of Class 5 ASS, the potential for exposure is low.

Despite the classification, should ASS be uncovered during excavation activities at the Proposal Area, the potential impact would be managed through the implementation of an acid sulfate soil management plan (ASSMP) as detailed in **Section 6.6.4**. Overall, it is considered that the potential impact of ASS as a result of construction works within the Proposal Area is considered to be negligible.

Contamination

Excavation also has the potential to expose contaminants within the soil underlying the road surface, which if not appropriately managed, can present a health risk concern to construction workers and the community. The exposure of contaminants could also pose an environmental risk if they were to enter nearby waterways via stormwater infrastructure.

Potential contamination impacts may also arise from the use of fuels, lubricants and chemicals for construction plant and equipment for the Proposal. Fuels, lubricants and chemicals have the potential to be spilled during construction and transfer offsite to adjacent properties or may contaminate the stormwater system.

The risk of impacts from contamination (if any) on human health and the receiving environment from construction activities would be reduced and managed through the mitigation measures identified in **Section 6.6.4**. Further, the extent of potential contamination is unlikely to be significant enough to preclude the Proposal from going ahead as there would be no change to the existing land use post-development. Overall the impact resulting from contamination within the Proposal Area is considered to be low.

6.6.3 Potential operational impacts

During the operational phase of the Proposal, general, non-periodic maintenance, is likely to be required to ensure the continued, efficient operation of the shared path and the road generally. During maintenance, there is potential for contamination to occur as a result of accidental fuel, oil or chemical spills. The potential impact as a result of this would be mitigated through the implementation of mitigation measures identified in **Section 6.6.4** and through following the appropriate protocols for those maintenance works.

6.6.4 Mitigation measures

The following mitigation measures would apply to the Proposal:

- Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction
- Erosion and sediment control measures would be established prior to any site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. These measures would be maintained and left in place until the works are complete and areas are stabilised
- Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area
- All fuels, chemicals and hazardous liquids would be stored within an impervious bunded area in accordance with Australian Standards and EPA Guidelines
- Prior to or during construction, further assessment and testing would be carried out to further characterise and target materials to be disturbed/excavated
- An appropriate Unexpected Finds Protocol, considering potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with SafeWork NSW requirements
- All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility
- All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste* (EPA, 2014) prior to disposal
- Hydrocarbons and chemicals such as fuels, lubricants and oils would be stored on-site in dedicated facilities such as secure sheds, containers, storage tanks and proprietary hazardous substance cupboards, and in accordance with the applicable Safety Data Sheet (SDS)
- In the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the City of Sydney Proposal Manager and the City of Sydney Environmental Officer. The EPA would be notified by City of Sydney if required, in accordance with Part 5.7 of the POEO Act
- Spill kits appropriate to products used on site must be readily available

- Spills of fuel, oil, chemicals or the like would be cleaned immediately, and the site environmental manager would be notified of the location of the incident, extent of the incident and type of material spilled.

6.7 Air quality

6.7.1 Existing environment

The air quality of Sydney is comparable with other Australian cities and is relatively good compared to other urban regions overseas. Concentrations of air pollutants including carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and lead (Pb) are low and stable, and consistently meet the national air quality standards. However, ozone (O_3) and particulate matter (PM_{10} and $PM_{2.5}$) levels can exceed the national standard from time to time across Sydney (Office of Environment and Heritage, 2018).

A search of the National Pollutant Inventory (NPI) database was undertaken on 21 September 2020. Searches were conducted within an extent of 1 kilometre of the Proposal Area. The database identified the following NPI facilities:

- 'Viridian Alexandria' which provide glass and glass product manufacturing at 8-40 Euston Road located approximately 460 metres away from Fox avenue and Copeland Street
- 'Australian Refined Alloys', which process copper, silver, lead and zinc smelting and refining, located at 202-212 Euston Road, Alexandria. This is located approximately 560 metres away from the corner of Fox avenue and Copeland Street
- 'State Rail Xplorer Endeavour Service Centre', which provide Railway Rolling Stock Manufacturing and Repair Services', located at Railway parade in Erskineville is located approximately 470 metres from Brown Street and Sutton Street.

Potentially affected receivers within the vicinity of the Proposal Area include local residents, businesses, warehouses, sporting facilities, educational facilities surrounding the site.

6.7.2 Potential construction impacts

Temporary air quality impacts that have the potential to occur during construction include minor increases in dust and emissions of carbon monoxide, sulphur dioxide, particulate matter, nitrous oxides, volatile organic compounds and other substances associated with excavation and the combustion of diesel fuel and petrol from construction plant and equipment.

Anticipated sources of dust and dust-generating activities include:

- Removal of existing road surfaces
- Stockpiling activities
- Loading and transfer of material from trucks
- Other general construction activities.

The air quality impact associated with the above activities would be localised and generally contained within the construction area. These impacts would be small scale, involving small numbers of machinery, vehicles and equipment. They would also be intermittent and temporary, being restricted to construction hours. Appropriate measures would be established to manage dust emissions from construction and demolition works. On this basis the overall significance of air quality impacts associated with the construction of the Proposal is expected to be minor.

6.7.3 Potential operational impacts

The Proposal is anticipated to encourage a mode shift to active transport from the use of private vehicles, aiding a reduction in emissions in the long-term.

6.7.4 Mitigation measures

The following mitigation measures would apply to the Proposal:

- Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks
- Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling
- Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable
- To minimise the generation of dust from construction activities, the following measures would be implemented:
  - apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)
  - cover stockpiles when not in use
  - appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading
  - prevent mud and dirt being tracked onto sealed road surfaces.

6.8 Biodiversity

6.8.1 Existing environment

Landscape context

The Proposal is located within an inner-city suburb south of Sydney's CBD. The area is heavily urbanised and vegetation consists of landscaped areas (vegetated medians, parks and residential gardens) and street trees.

The Proposal Area (Swanson Street), is tree lined either side of Swanson Street and Copeland Street. On the northern side of Swanson, the tree coverage is more sparse, especially surrounding the shops at Park Street. On the southern side of Swanson Street, adjacent to Harry Noble Reserve, tree cover is denser and dispersed approximately 2-3 metres apart on either side of the footpath. On the roadside of the footpath there are also planter boxes. Henry Noble Reserve and Erskineville Park features landscaping and grassed lawns. Henry Noble Reserve features a children's playground, concrete footpaths, park benches, and a grassed open space area. Erskineville Oval features a grassed rugby field. Elliot Avenue and Fox Avenue are similarly vegetated with street trees from Henry Noble Reserve and Erskineville Park. Residential landscape features are limited as most of the residences in the area are terrace apartments without significant setbacks which are sometimes used for front gardens.

The Proposal Area (Mitchell Road), is tree lined on the west side of Mitchell Road from trees within the boundaries of Central Sydney Intensive English High School. The roadside kerb also features some shrub vegetation. Similarly, overarching trees from Central Sydney Intensive English High School are apparent on Brown Street. The residential property facades on this street are generally garage doors or walls and fences. Buckland Street is tree lined on both sides, and are encased in concrete paved kerbsides. A small number of private properties on Buckland Street have vegetation which contribute to urban greenery on the street.

Database searches

Database searches do not provide the exact species that are located within or around the Proposal Area. They provide an indication of the species that may, are likely, or known to occur in the area based on species' sightings, favoured habitats and behaviours.

A search of the Atlas of NSW Wildlife (NSW BioNet) on 21 September 2020 found records of 70 threatened flora and fauna species listed under the BC Act within a 10 square kilometre area around the Proposal Area. According to the BioNet Atlas Map, the following individual species have been recorded in the area bordered by Ashmore Street to the south, Mitchell Road, Buckland Street, and Botany Road to the east, and the railway line to the north.

- *Ninox strenua* – Powerful Owl (fauna) recorded at the corner of Copeland Street and Newton Street
- *Pteropus poliocephalus*– Grey-headed Flying-fox (fauna) numerous records at, but not limited to:
    - 34 Lyne Street, Alexandria
    - 51 Gerard Street, Alexandria
    - between Railway parade and train tracks, Erskineville and
    - Erskineville Station.

A further search was undertaking using the EPBC Act Protected Matters Search Tool (21 September 2020). The search was undertaken for the Proposal Area and a 1 km buffer around the Proposal Area (centred at the corner of Fox avenue and Swanson Street). The search identified the following:

The search also identified:

- 5 listed threatened ecological communities
- 36 listed threatened species
- 17 listed migratory species

Flora

The Proposal Area (Swanson Street) currently features approximately 64 street trees along the southern side of Swanson Street, along both sides of Fox avenue, Park Street and Elliot Avenue. The Proposal Area (Mitchell Road) currently features approximately 40 trees along Mitchell Road, Buckland Street, and Brown Street. City of Sydney's Significant Tree Register lists a series of 38 London Pant (Platanus x acerifolia) lining Buckland Street which were planted probably during the 1960s and 1970s. These are of local group significance regarding their visual and social values. Five species are also listed in Alexandria Park of significant value planted from the 1890s. These include the Port Jackson Fig (f. glabrescens) (Ficus rubiginosa f. glabrescens), the Port Jackson Fig (f. rubiginosa (Ficus rubiginosa f. rubiginosa), the Moreton Bay Fig (Ficus macrophylla), the River Red Gum (Eucalyptus camaldulensis) and the American Cottonwood (Populus deltoides).

Fauna

The Proposal Area is located within an area subject to ongoing human activity including vehicle and pedestrian movements throughout the day and night. As such the potential habitat value for threatened or migratory fauna is minimal.

Despite this, common fauna to Sydney's inner-city suburbs may be present such as birds, possums, flying foxes, bats and other rodents. There are three threatened species in Sydney that may be present in the Proposal Area including: powerful owls, eastern bent-wing bats and grey-headed flying foxes.

6.8.2 Potential construction impacts

Based on the premise that no trees are being replaced or removed, there would be minimal impacts on biodiversity during the construction phase. There would be a small degree of direct disturbance to fauna during the construction phase due to visual occupation of sites nearby trees and other habitats, as well as disturbance resulting from construction noise and other effects. Where the works are within close proximity to trees, tree protection is to be established.

6.8.3 Potential operational impacts

The potential for further operational impacts to biodiversity as a result of the Proposal is considered to be limited.

6.8.4 Mitigation measures

A number of mitigation measures are proposed to minimise the biodiversity impact of the Proposal including:

- All workers are to be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity
- Disturbance of vegetation is to be limited to the minimum amount necessary to construct the Proposal. No trees are planned to be removed. Trees in the Proposal Area would be protected through temporary protection measures discussed below
  - tree protection would be undertaken in line with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of tree protection zones (TPZs)
  - in the event of any tree to be retained becoming damaged during construction, the Construction Contractor is to immediately notify the City of Sydney Project Manager and the City of Sydney environmental officer to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.

6.9 Hydrology and water quality

6.9.1 Existing environment

The nearest watercourse to the Proposal Area is the Sheas watercourse/drainage system located approximately 600 m from the corner of Mitchell Road and Swanson Street. This concrete watercourse connects to the tree-lined Alexandra Canal. This Canal then intersects with the Cooks River, part of the Cooks River catchment which begins in Yagoona and flows through to the inner south west of Sydney to Botany Bay.

The Proposal is in an area where soils have been heavily modified by urban development. The catchment is highly urbanised and contains a high proportion of impervious surfaces. The Cooks River is in a degraded condition. Historically the catchment was stripped of natural vegetation, and dumped with sewerage, industrial and domestic waste, stormwater pollution and rubbish. Industrial pollution is no longer allowed however sewerage overflows, rubbish and stormwater runoff are continuing processes affecting the River's water quality. Water quality that drains to the Cooks River is generally poor. Stormwater from the urban catchment is generally not treated (except for gross pollutants in some locations). Common urban stormwater pollutants are likely to exist.

As outlined in **Section 6.6.1**, a review of the list of NSW Contaminated Sites notified to the Environment Protection Authority as of 21 September 2020 identified no contaminated sites within the Proposal Area. A search of the Office of Environment and Heritage contaminated land record of notices (21 September 2020) returned no records for locations within the Proposal Area.

6.9.2 Potential construction impacts

The Proposal would have a minor effect on an already modified landform. Changes would be limited to the road verge. The construction phase of the Proposal has the potential to result in impacts to the surface water quality should construction materials enter a local stormwater system. Impacts may include:

- Accidental spills of fuels, oils or other chemicals from construction vehicles or equipment
- Sediment from excavated and disturbed areas and stockpiles, generated during rainfall events
- Release of hazardous materials due to wind or water erosion of contaminated spoil/fill materials.

Spills and leaks would be managed by maintaining equipment and conducting activities with the potential to cause a spill in a safe manner. Potential impacts on surface water quality during construction of the Proposal would be similar to those experienced for other urban construction projects and are considered manageable with the application of mitigation measures.

The Sydney LEP shows that 100 year ARI Peak Flood prone areas over 0.5 metres peak flood depth around Allen avenue (located approximately 120 metres from the Proposal Area) and Buckland Street (located adjacent to the end of the Proposal Area). The PMF Peak Flood Depths maps also showed areas above one metre high between Renwick Street, Newton Street and Henderson Lane, as well as on Buckland Street adjacent the end of the Proposal Area.

The Proposal Area is not located in a flood planning area; however, construction flooding and drainage impacts could potentially arise as a result of:

- Drainage infrastructure may become blocked (e.g. by soil, vegetation, waste) or temporarily diverted due to construction activities. Temporary disruption to local drainage lines may result in localised flooding in parts of the Proposal Area
- Removal of existing pavement could divert flow away from designed drainage structures and into new receiving areas. Diverting drainage lines may also create localised areas of flooding and scour unless managed appropriately.

Utility relocation is not likely to change existing flow patterns or the flooding regime. It is proposed that the contractor would ensure that all existing drainage would remain operational until the new drainage for the Proposal has been constructed.

6.9.3 Potential operational impacts

The operation of the new shared path would not result in any exposure of soil or increase in impervious surfaces. The design of the shared path would not alter the existing drainage regime. Therefore, no impacts to hydrology, water quality or drainage are anticipated during operation of the shared path.

6.9.4 Mitigation measures

The following mitigation measures are recommended to minimise the potential impacts on hydrology and water quality management:

- Temporary drainage or drainage diversions would be installed so that stormwater function is not impeded during construction An Erosion and Sedimentation Control Plan (ESCP) would be prepared in accordance with the Landcom Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) prior to construction
- Disturbed surfaces would be compacted and stabilised in anticipation of a rain event to reduce the potential for erosion
- Any material deposited onto pavements would be swept and removed at the end of each working shift and prior to rainfall
- Fuels, oils and other chemicals would not be stored in the vicinity of the construction site wherever possible
- Emergency wet and dry spill kits would be kept on site at all times and all staff would be made aware of the location of the spill kit and trained in its use.

6.10 Climate change and greenhouse gas emissions

6.10.1 Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate and understand the limitation of adaptation.

Sydney may be affected in future by an increase in maximum and minimum temperatures across all seasons, more days of extreme heat and heatwaves, changes in seasonal rainfall patterns and increased intensity of extreme rainfall events and increased drought conditions.

Impacts associated with extreme heat include compromising the structural integrity of road and access path surfaces, causing heat stress in users of the shared path and heat stress to landscaped vegetation. Measures such as the provision of landscaping to increase shade should be reviewed for feasibility during detailed design to help reduce impacts from extreme heat.

Climate change is also expected to lead to an increase in average rainfall, increase in extreme rainfall and increased average recurrence interval for hail events. Impacts associated with changes to rainfall include localised flooding and surface flow, damage to aboveground structures where hail and/or damaging winds occur with the rainfall event and damage to vegetation due to overwatering and/or impact damage. Adequate drainage over the road network would help reduce impacts from extreme rainfall.

6.10.2 Greenhouse gas emissions

An increase in greenhouse gas emissions, primarily carbon dioxide, would be expected during construction of the Proposal from exhaust emissions from construction machinery and vehicles transporting materials and personnel.

Due to the small scale of the Proposal and the short term temporary nature of the individual construction works, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in **Chapter 7.0**.It is anticipated that, once operational, the Proposal may result in an increase in use of active transport and a relative decrease in use of private motor vehicles which could result in a reduction in fuel consumption and therefore a relative reduction in associated greenhouse gas emissions in the local area.

6.11 Waste

6.11.1 Existing environment

The waste regulatory framework is administered under the POEO Act and the WARR Act as outlined in **Table 4-2**. The purpose of these acts are to prevent degradation of the environment, eliminate harmful wastes, reduce the amount of waste generated and establish priorities for waste reuse, recovery and recycling. The WARR Act establishes a waste hierarchy, which comprises the following principles

- Avoidance of waste – minimising the amount of waste generated during construction by avoiding unnecessary resource consumption (ie avoiding the use of inefficient plant and construction equipment and avoiding materials with excess embodied energy, waste and excessive packaging)
- Resource recovery – reusing, reprocessing and recycling waste products generated during construction to minimise the amount of waste requiring disposal
- Disposal – where resources cannot be recovered, they would be appropriately disposed of to minimise the potential adverse environmental impacts likely to be associated with their disposal.

By adopting the WARR Act principles, City of Sydney encourages the most efficient use of resources and reduces cost and environmental harm in accordance with the principles of ecologically sustainable development.

The City is committed to recycling and reusing 80% of waste generated during construction and this remains a priority with the Proposal.

6.11.2 Potential construction impacts

Waste generating activities

There is the potential for waste generation during Proposal construction, arising primarily from the following activities:

- Demolition of existing road infrastructure including kerbs, verges, medians, footpaths and roadways
- Relocation and/or installation of utilities and services
- Removal and installation of stormwater drainage pipelines and associated kerb and gutter adjustments.

As outlined in **Section 3.1.4**, earthworks would be minor, and generated from works including the removal of the surface layer of the road overlaying the proposed shared path alignment, widening and realignment of road lanes as well as kerb reconstruction and realignment.

Waste streams

The quantities of waste generated during construction are likely to be minor, based on the nature of the works and the earthworks generating excess spoil described in **Section 3.1.4**. Waste material anticipated to accumulate during construction is classified as 'general solid waste (non-putrescible)'.

Waste streams likely to be generated during the construction stage include:

- Construction and demolition waste from removal of existing road surface and utility relocation (soil, bitumen, concrete, asphalt, metal)
- Excess construction materials
- Excess spoil from excavations which is unsuitable for reuse
- Roadside materials (such as signage and fencing)
- Green waste from vegetation removal
- Roadside materials such as signage and fencing
- Waste water from wash down areas
- Paper and packaging wastes from materials brought to site
- Redundant erosion and sediment controls
- General and domestic waste from the construction ancillary facility and laydown areas.

In relation to the Proposal, there would be few opportunities for reuse of materials given the nature of the activities proposed. Spoil and topsoil generated from earthworks could potentially be re-used in some locations if it meets the appropriate soil quality and classification standards for re-use.

Materials and spoil declared unsuitable to be reused would be classified in accordance with the *Waste Classification Guidelines* (EPA 2014) and disposed of at an approved recycling or waste disposal facility depending on whether they can be reused or not.

Resource use

The materials required during the proposed construction works are not currently restricted resources although, materials such as metals and fuels are considered non-renewable and should be used conservatively. Road pavement materials would be sourced from appropriately licenced facilities and from local suppliers where practical. Where possible, the reuse of existing materials and the recycling of materials would be conducted.

6.11.3 Potential operational impacts

The operation of the Proposal would not result in increased waste generation.

6.11.4 Mitigation measures

The following mitigation measures are recommended to minimise the potential impacts on waste management:

- A Waste Management Plan (WMP) would be prepared and implemented as part of the CEMP. The WMP would include but not be limited to:
  - measures to avoid and minimise waste associated with the Proposal
  - classification of wastes and management options (re-use, recycle, stockpile, disposal) in accordance with the *Waste Classification Guidelines* (EPA, 2014) and NSW legislative requirements
  - 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 would be prepared taking into account the WARR Act and *Waste Classification Guidelines* (EPA, 2014)

- A far as practicable, construction materials shall be sourced within the Sydney region so as to reduce transport costs, including fuel usage
- Hierarchy of waste management shall be implemented via:
  - separation of general wastes, recyclable/reusable materials, and hazardous wastes to avoid mixing with other materials/wastes
  - regular housekeeping and servicing of waste storages
  - general waste and recycling receptacles would be provided onsite. Waste would be transported to an appropriately licensed waste disposal and/or recycling facility
  - wastes (including green waste) shall not be burnt
  - weed removal activities including removal of weeds prior to tree removal works to allow non-weed infested mulched material to be reused on site
  - potential for mulching and reuse of cleared vegetation would be balanced against presence of noxious weeds and compliance with necessary weed control measures.
- Waste disposed of offsite shall be taken to a waste facility that is licenced under the POEO Act to receive wastes of that type
- Work areas would be kept free of rubbish, with appropriate receptacles provided for waste management and recycling.

6.12 Socioeconomic impacts

6.12.1 Existing environment

Population and growth

Within Sydney LGA, the Proposal Area is in the SA2 area of Erskineville-Alexandria which covers approximately 431.7 hectares of land. In 2015, the estimated resident population was 16,713. The population is relatively young, with the median age group estimated at between 25-34 years old. The industry in the area is mainly comprised of rental, hiring and real estate, professional, scientific and technical services, wholesale trading, and retail businesses. According to the ABS, approximately 55% of residents have a registered vehicle in the SA2 area. Out of nearly 10,000 employed people surveyed in 2011, approximately 35% drove to work, followed by approximately 25% that used the trains. According to this survey approximately 4% of people cycled to work in the SA2 area.

Social infrastructure

Social infrastructure refers to community facilities, services and networks which help individuals, families, groups and communities meet their social needs, maximise their potential for development and enhance community wellbeing.

The suburbs of Erskineville and Alexandria provide a wide range of community services and facilities catering for local residents, commercial and industrial uses. Most of the area was formerly industrial estate, however gentrification has taken place slowly and this area is now comprised of a mix of uses. These include residential neighbourhoods, local centres, education facilities, transport facilities, parks, entertainment precincts, retail, warehouses, and other services.

Key social infrastructure located near the Proposal includes:

- Erskineville Railway Station
- Open space and parks, including (but not limited to) Erskineville Oval, Alexandria Park, and (further south) Sydney Park
- Educational facilities, including (but not limited to) St Mary's Catholic Primary School, Erskineville Public School, Central Sydney Intensive English High School, Alexandria Park

Community School, Our Lady of Mt Carmel Catholic Primary School, Village Nation, Yudi Gunyi School and Sydney Film School

- Cycle facilities, including (but not limited to) temporary cycleways on Railway Parade at Erskineville Station, and off-road shared cycleways or low traffic Streets or bike lanes in the surrounding Streets on Copeland Street, Monks lane, Henderson lane. There are also some low traffic Street or bike lanes with wayfinding signage on Buckland Street and Ashmore Street.

To meet the needs of the residents, the City of Sydney has committed to be green, global and connected. Relevantly, the City of Sydney intends to make the city easy to get around, with a local network for walking and cycling, connecting the city's villages, city centre and the rest of inner Sydney (City of Sydney, *Sustainable Sydney 2030 – Community Strategic Plan 2017 – 2021*).

6.12.2 Potential construction Impacts

During construction, impacts to the community would primarily include noise, visual amenity and dust generation and availability of kerbside parking. Impacts to visual amenity during construction include: hoarding, temporary fencing around protected trees, removed sections of the road and stationing of operating machinery plant and equipment. Impacts to air quality during construction would impact the community temporarily. This impact includes minor increases in dust and emissions of carbon monoxide, sulphur dioxide, particulate matter, nitrous oxides, volatile organic compounds and other substances associated with excavation and the combustion of diesel fuel and petrol from construction plant and equipment. Construction noise is likely to affect nearby residential and other sensitive receivers as detailed in section 6.2. The impact of air quality, noise and visuals effect is likely to be minimal and temporary for the community. As the Proposal is located in an urbanised inner city suburb environment, the majority of sensitive receivers nearby the Proposal reside within townhouse buildings. Notwithstanding, other receivers, namely pedestrians and people riding bikes, would also experience those impacts. The extent of those impacts have been outlined within this REF and mitigation measures detailed in **Chapter 7.0** aim to reduce their affect.

Where needed, temporary changes to local access associated with construction work would result in potential delays and disruption for motorists, people riding bikes and pedestrians including:

- The partial and temporary closure of footpaths during construction of the Road and footpath, resulting in disruptions to pedestrian movements
- Changes to the traffic environment, due to some traffic lanes needing to be temporarily closed off during construction
- Potential temporary closure of parking spaces adjacent to Proposal Area footpaths

Some businesses located adjacent to the proposed shared path infrastructure would be potentially affected through the installation or removal of infrastructure. In particular:

- During construction, there would be disruption to direct access for pedestrians and vehicles to some businesses
- Businesses reliant on the delivery of goods would be affected by changes to nearby parking.

6.12.3 Potential operational impacts

The Proposal would form part of an expanding cycling network within the City of Sydney LGA. It would support longer term modal shifts away from the use of private motor vehicles towards active transport, in response to the growing number of residents and workers who prefer the convenience, mobility and sustainability benefits that cycling provides. This would bring with it improvements in air quality, noise, the streetscape and equality in transport access. Increases in active transport would also bring broader (and more subtle) public health benefits.

The Proposal would also provide benefits for pedestrians, with enhanced and upgraded footpaths and street furniture throughout the Proposal Area.

6.12.4 Mitigation measures

A number of environmental safeguards would be implemented to minimise potential impacts on the community with a particular focus on keeping the community informed including:

- Mitigation measures in respect of potential impacts on amenity (e.g. noise, dust and visual) as listed in **Chapter 7.0**
- Feedback would be sought through the submissions process to facilitate opportunities for the community and stakeholders to have input into the project, where practicable
- The community should be informed of construction progress and activities as relevant in their area.

6.13 Cumulative impacts

The delivery of the Proposal has the potential to result in cumulative impacts. This would primarily occur during the construction stage of the Proposal, due to coinciding development projects in the area. Collectively, the Proposal and nearby developments could result in increased cumulative impacts on the local community related to traffic, noise and air quality impacts during construction.

6.13.1 Coinciding projects

121 Henderson Road, Alexandria

A DA is under consideration for the modification for residential and commercial land at 121 Henderson Road, Alexandria. This is located approximately 380 metres north of the Proposal Area on Swanson/Copeland Street.

Alexandria Park Community School – Modification 2

A DA is approaching assessment for a SSD modification to an educational establishment at Alexandria Park. It is noted that Alexandria Park is located on Buckland Street, in close proximity to the scope of works on Buckland Street in this project.

City of Sydney cycleway projects

This project is one of multiple cycleway and shared path projects occurring in the Sydney LGA as part of their *Sustainable Sydney 2030, City of Sydney Cycle Strategy and Action Plan 2018-2030,* and *NSW Bike Plan* and other incentivising cycling strategies. It is acknowledged that similar cycleway projects are being proposed surrounding suburbs. There is potential to block off roads if Proposals are constructed at similar timeframes. A nearby cycleway project on Ashmore Street may interfere with access to Erskineville Oval via Fox avenue. It should be noted these works should be constructed provided there are no access barriers at this entrance during the time of construction.

6.13.2 Potential construction impacts

Potential temporary construction cumulative impacts include:

- Cumulative increases in construction vehicle traffic on public roads causing congestion and delays
- Cumulative noise and vibration impacts associated with multiple construction work, particularly at night
- Disruption to public transport services
- Disruption to pedestrian amenity and capacity due to footpath restrictions during construction, including increased pedestrian journey times
- Amenity impacts resulting from the implementation of traffic management controls across the city centre
- Cumulative changes to water quality of nearby waterways or groundwater from multiple construction sites.

To address these issues, Council would work with other developers as part of a construction liaison group. This group would coordinate construction of each project to minimise associated impacts on the local area, especially to existing businesses affected by the Proposal.

6.13.3 Potential operational impacts

The Proposal would facilitate the integrated movement of people riding bikes as identified in City of Sydney's '*Cycling strategy and action plan*'. The Proposal is also part of a wider program to manage traffic congestion and provide transport systems for Sydney's future growth. The predicted increase in daily bike movements along the network may be expected to translate into a reduction in vehicle volumes in the surrounding area. This would result in improvements in traffic congestion and safety as well as overall health benefits from improved air quality and a greater number of individuals participating in active transport.

6.13.4 Mitigation measures

The following mitigation measures are recommended to minimise the potential cumulative impacts:

- The construction contractor will consider cumulative effects of construction of the Proposal alongside other nearby projects. For example, there is potential to block access to Erskineville Oval via Fox Avenue with this Proposal and another Proposal on Ashmore Street. The contractor would need to coordinate works to prevent undue disruptions
- Consult with TfNSW to obtain information about project timeframes and impacts. Identify and implement appropriate safeguards and management measures to minimise cumulative impacts of construction if any of the projects are constructed at the same time as the Proposal
- The traffic management plan including Road Occupancy Licenses would be prepared in consultation with the Transport Management Centre taking into consideration the traffic cumulative impact of projects on the Sydney Road network
- The CEMP would be revised to consider potential cumulative impacts from surrounding development activities as they become known. This would include a process to review and update mitigation measures as new works begin or if complaints are received.

7.0 Environmental management

This chapter describes how the Proposal would be managed through environmental management plans and specific safeguards, to reduce the potential environmental impacts throughout detailed design, construction and operation.

Mitigation measures have been developed to be consistent with the Clause 228 Guidelines.

7.1 Construction environmental management plans

A Construction Environmental Management Plan (CEMP) would be prepared in accordance with the requirements of Council's Environmental Management System for the construction phase of the Proposal. The CEMP provides a mechanism through which all potential environmental impacts relevant to the Proposal would be controlled, and outlines a framework of procedures and controls for managing environmental impacts during construction.

7.2 Safeguards and mitigation measures

Environmental safeguards and mitigation measures proposed for the Proposal are outlined in the table below. These safeguards would minimise the potential adverse engineering, environmental and planning impacts of the Proposal described in **Section 6.0.**

Table 7-1 Environmental safeguards and mitigation measures

No.	Impact	Environmental safeguards	Timing
TT1	Traffic management	Appropriate traffic management measures would be implemented and maintained such as temporary speed restrictions, precautionary signs, illuminated warning devices, manual and/or electronic traffic control and provision of temporary barriers and markers to control the proposed work areas	Construction
TT2	Access	During construction, arrangements would be made to ensure access to businesses, residential and recreational premises adjacent to construction areas would be maintained at all times	Construction
TT3	Notification regarding access	During construction affected businesses and residential premises would be notified in relation to any temporary access restrictions or limitations	Construction
TT4	Consultation with business owners and residents regarding parking	Business owners and residents would be informed of all changes in kerbside use, including the temporary change in on-street parking spaces. This consultation would outline the locations of any alternative areas of parking or loading in nearby streets and in off-street locations in accordance with the kerbside usage strategy	Pre-Construction
TT5	Licences	Road occupancy licences would be obtained from TfNSW Transport Management Centre for all construction activities.	Pre-Construction
TT6	Conflicting activities	TfNSW Transport Management Centre would ensure that no significant conflicts between construction activities and major events in the locality occur	Pre-Construction
TT7	Bike riding communication strategy	A bike riding communication strategy would be implemented that would include establishing information signs and maps to inform people riding bikes of changes to cycleways and shared paths within the surrounding locality. As part of the strategy, communication signs and material would be	Pre-Construction

No.	Impact	Environmental safeguards	Timing
		strategically located along major bike riding travel routes to clearly communicate proposed and ongoing changes.	
NV1	Construction noise and vibration management plan	Prepare a construction noise and vibration management plan (CNVMP). The CNVMP would be a sub-plan of the CEMP and as a minimum it would: - map the sensitive receiver locations including residential properties - a work program developed in consultation with TfNSW that would manage night noise impacts - include safeguards and management measures to manage out of hours working - include an assessment to determine potential risk for activities likely to affect receivers, including for activities undertaken during and outside of standard working hours - include a process for assessing the performance of the implemented safeguards and management measures	Pre-Construction
NV2	Noise management plan for works outside normal hours	Where work outside standard hours are unavoidable due to traffic, technical and/or safety constraints, a noise management plan for works outside normal hours would be developed. The plan would include works to be conducted, noise assessment for the proposed works in accordance to EPA requirements and consolation process	Pre-Construction
NV3	Notification to affected receivers	Affected receivers would be notified ahead of time of the likely activities, noise impacts and duration of this work	Pre-Construction
NV4	Notification to nearby receivers	Nearby receivers would be notified of any work in advance of the start of construction. This is essential for residential receivers potentially affected by night time work	Pre-Construction
NV5	Noise complaints management	A community complaints phone number would be established and advertised prior to works commencing and be available during work periods. The community complaints line would be established for any complaints or queries regarding construction	Pre-Construction
NV6	Noisy wheeled equipment	Where reasonable and feasible rubber tracked or wheeled equipment would be used instead of standard, steel tracked plant	Construction
NV7	Noisy plant	Plant would be turned off when not in use	Construction
NV8	Road plates	The use of road plates would be avoided where reasonable and feasible. If their use is necessary, they would be properly installed and maintained	Construction
NV9	Work site arrangements	The work site would be arranged to minimise the use of movement alarms on vehicles and mobile plant	Construction

No.	Impact	Environmental safeguards	Timing
NV10	Reverse beepers	Where safety concerns can be adequately managed, the use of squawker, broadband or visual reversing alarms would be considered, rather than traditional beeper styles	Construction
NV11	Night time noise during night time hours	The use of equipment or methods that generate impulsive noise, particularly during night time hours would be avoided. These include dropping materials from a height, loading/unloading of trucks and metal on metal contact	Construction
NV12	Noise monitoring program	Noise monitoring would be considered in response to complaints	Construction
NV13	Complaints handling procedure	A complaints handling procedure would established and implemented	Construction
NV14	Temporary noise barriers	Implement noise containment measures and temporary noise barriers where feasible and reasonable where it is determined that the work would have an unreasonable adverse impact on the surrounding community. Use the number of received community complaints as a measure of impact and conduct noise monitoring to determine whether the generated noise is excessive.	Construction
NV15	Construction program	The community will be informed of key dates and updated as works progress.	Construction
NV16	Vibration Management Plan	Should the works require the use of equipment that generates vibration within the minimum distances specified in **Table 6-3**, a Vibration Management Plan would be included alongside the Construction Environmental Management Plan (CEMP), and would include as a minimum the following: - where building damage vibration impacts may be felt, building inspections and site specific vibration testing would be considered - where human comfort vibration impacts may be felt, the use of alternative methods for construction work would be investigated - the smallest plant required to undertake the construction work would be used - where heritage or vibration sensitive premises are located within 50 metres of the worksite, building inspections and site specific vibration testing would be considered.	Construction
LV1	Construction lighting	Construction lighting is to be positioned such that light spill on neighbouring properties is minimised and that it is turned off when not in use and safe to do so	Construction

No.	Impact	Environmental safeguards	Timing
LV2	Construction lighting	The layout, directional positioning and types of lighting selected to minimise impacts are to be specified by the construction contractor in the CEMP	Pre-Construction
LV3	Work sites	A high level of housekeeping would be maintained by ensuring that the work site is kept in a clean and tidy condition, with appropriate areas designated for storage of waste materials	Construction
LV4	Disturbed groundcover	Groundcover disturbed during construction would be re-established as soon as practical	Construction
LV5	Waste materials	Waste materials must be removed from site regularly	Construction
LV6	Design of new elements	Design of new elements would be designed in accordance with *Sydney Streets Code* (City of Sydney, 2013) as applicable.	Design
HER1	Conditions assessment of heritage items	Condition assessments for the identified heritage items would be conducted prior to the start of construction. Additional vibration assessment would be conducted if it is deemed required by the assessor.	Pre-Construction
HER2	Damage to heritage items	If any inadvertent damage occurs to heritage items in the vicinity of the study area due to vibration or other works, the damage must be reported immediately to the Proposal Manager and the relevant heritage specialists. Damage is to be made good in accordance with specialist heritage advice.	Construction
HER4	Heritage induction	All relevant construction staff, contractors and subcontractors must be made aware of their statutory obligations for heritage under the NSW Heritage Act 1977 and best practice as outlined in The Burra Charter (Australia ICOMOS 2013) to ensure no archaeological remains or heritage fabric are affected during the proposed works without appropriate mitigation measures in place. This would be implemented through a heritage induction carried out prior to works commencing and throughout the works program.	Construction
HER5	Unanticipated archaeological deposits	In the event that any unanticipated archaeological deposits are identified within the Proposal Area during construction, the procedures contained in **insert City of Sydney Unexpected finds protocol if applicable** would be followed and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the City of Sydney Proposal Manager and the City of Sydney environmental officer so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and DPIE. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.	Construction
IH1	Heritage induction	All construction staff would undergo an induction in the recognition of Indigenous cultural heritage	Construction

No.	Impact	Environmental safeguards	Timing
		material. This training would include information such as the importance of Indigenous cultural heritage material and places to the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.	
IH2	Unanticipated Indigenous objects	If unforeseen Indigenous objects are uncovered during construction, an unexpected finds procedure would be followed, and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the City of Sydney Proposal Manager and City of Sydney environmental officer so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the DPIE and the Local Aboriginal Land Council.	Construction
CLGS1	Site-specific Erosion and Sediment Control Plan	Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction	Pre-Construction
CLGS2	Erosion and sediment control	Erosion and sediment control measures would be established prior to any site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. These measures would be maintained and left in place until the works are complete and areas are stabilised	Pre-Construction
CLGS3	Vehicles and machinery maintenance	Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area	Construction
CLGS4	Storage of fuels, chemicals and hazardous liquids	All fuels, chemicals and hazardous liquids would be stored within an impervious bunded area in accordance with Australian Standards and EPA Guidelines	Construction
CLGS5	Contaminated soils	Prior to or during construction, further assessment and testing would be carried out to further characterise and target materials to be disturbed/excavated	Pre-Construction
CLGS6	Unexpected Finds Protocol	An appropriate Unexpected Finds Protocol, considering potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with SafeWork NSW requirements	Pre-Construction and Construction

No.	Impact	Environmental safeguards	Timing
CLGS7	Testing potential contaminated spoil	All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility	Construction
CLGS8	Classifying waste and spoil	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste* (EPA, 2014) prior to disposal	Construction
CLGS9	Dedicated storage facilities for hydrocarbons and chemicals	Hydrocarbons and chemicals such as fuels, lubricants and oils would be stored on-site in dedicated facilities such as secure sheds, containers, storage tanks and proprietary hazardous substance cupboards, and in accordance with the applicable Safety Data Sheet (SDS)	Construction
CLGS10	Pollution incident	In the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the City of Sydney Proposal Manager and the City of Sydney Environmental Officer. The EPA would be notified by City of Sydney if required, in accordance with Part 5.7 of the POEO Act	Construction
CLGS11	Spill kits	Spill kits appropriate to products used on site must be readily available	Construction
CLGS12	Spills of fuel, oil, chemicals	Spills of fuel, oil, chemicals or the like would be cleaned immediately, and the site environmental manager would be notified of the location of the incident, extent of the incident and type of material spilled	Construction
AQ1	Management of emissions	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks	Pre-Construction
AQ2	Vehicles and machinery maintenance	Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling	Construction
AQ3	Designated areas for vehicle and machinery movements	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable	Construction
AQ4	Generation of dust	To minimise the generation of dust from construction activities, the following measures would be implemented: - apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) - cover stockpiles when not in use - appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading	Construction

No.	Impact	Environmental safeguards	Timing
		- prevent mud and dirt being tracked onto sealed road surfaces.	
BIO1	Biodiversity induction	All workers are to be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity	Pre-Construction
BIO2	Disturbance of vegetation	Disturbance of vegetation is to be limited to the minimum amount necessary to construct the Proposal. Trees would be protected through temporary protection measures discussed below: - tree protection would be undertaken in line with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of tree protection zones (TPZs) - in the event of any tree to be retained becoming damaged during construction, the Construction Contractor is to immediately notify the City of Sydney Project Manager and the City of Sydney environmental officer to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.	Construction
HWQ1	Erosion and Sedimentation Control Plan	Temporary drainage or drainage diversions would be installed so that stormwater function is not impeded during construction. An Erosion and Sedimentation Control Plan (ESCP) would be prepared in accordance with the Landcom Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) prior to construction	Pre-Construction
HWQ2	Disturbed surfaces	Disturbed surfaces would be compacted and stabilised in anticipation of a rain event to reduce the potential for erosion	Construction
HWQ3	Removal of material deposited	Any material deposited onto pavements would be swept and removed at the end of each working shift and prior to rainfall	Construction
HWQ4	Storage of fuels, oils and other chemicals	Fuels, oils and other chemicals would not be stored in the vicinity of the construction site wherever possible	Construction
HWQ5	Emergency wet and dry spill kits	Emergency wet and dry spill kits would be kept on site at all times and all staff would be made aware of the location of the spill kit and trained in its use.	Construction
W1	Waste Management Plan	A Waste Management Plan (WMP) would be prepared and implemented as part of the CEMP. The WMP would include but not be limited to: - measures to avoid and minimise waste associated with the Proposal	Pre-Construction

No.	Impact	Environmental safeguards	Timing
		- classification of wastes and management options (re-use, recycle, stockpile, disposal) in accordance with the *Waste Classification Guidelines* (EPA, 2014) and NSW legislative requirements - 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 would be prepared taking into account the WARR Act and *Waste Classification Guidelines* (EPA, 2014)	
W2	Source of construction materials	A far as practicable, construction materials shall be sourced within the Sydney region so as to reduce transport costs, including fuel usage	Construction
W3	Waste management	Hierarchy of waste management shall be implemented via: - separation of general wastes, recyclable/reusable materials, and hazardous wastes to avoid mixing with other materials/wastes - regular housekeeping and servicing of waste storages - general waste and recycling receptacles would be provided onsite. Waste would be transported to an appropriately licensed waste disposal and/or recycling facility - wastes (including green waste) shall not be burnt - weed removal activities including removal of weeds prior to tree removal works to allow non-weed infested mulched material to be reused on site - potential for mulching and reuse of cleared vegetation would be balanced against presence of noxious weeds and compliance with necessary weed control measures.	Construction
W4	Waste facility licenced under the POEO Act	Waste disposed of offsite shall be taken to a waste facility that is licenced under the POEO Act to receive wastes of that type	Construction
W5	Work areas	Work areas would be kept free of rubbish, with appropriate receptacles provided for waste management and recycling	Construction
SE1	Socio-economic	Implementation of mitigation measures in respect of potential impacts on amenity (e.g. noise, dust and visual) as listed elsewhere in this section.	Construction
SE2	Feedback through the	Feedback would be sought through the submissions process to facilitate opportunities for the community	Pre-Construction

No.	Impact	Environmental safeguards	Timing
	submissions process	and stakeholders to have input into the project, where practicable	
SE3	Community information	The community should be informed of construction progress and activities as relevant in their area	Pre-Construction
CU1	Cumulative impacts	The construction contractor will consider cumulative effects of construction of the Proposal alongside other nearby projects. For example, there is potential to block access to Erskineville Oval via Fox Avenue with this Proposal and another Proposal on Ashmore Street. The contractor would need to coordinate works to prevent undue disruptions	Pre and During construction
CU2	Cumulative impacts	Consult with TfNSW to obtain information about project timeframes and impacts. Identify and implement appropriate safeguards and management measures to minimise cumulative impacts of construction if any of the projects are constructed at the same time as the Proposal	Pre-Construction
CU3	Cumulative impacts – traffic management plan	The traffic management plan including Road Occupancy Licenses would be prepared in consultation with the Transport Management Centre taking into consideration the traffic cumulative impact of projects on the Sydney road network	Pre-Construction
CU4	Cumulative impacts – CEMP	The CEMP would be revised to consider potential cumulative impacts from surrounding development activities as they become known. This would include a process to review and update mitigation measures as new works begin or if complaints are received.	Pre-Construction

7.3 Licensing and approvals

The licenses and approvals listed below are required for the delivery of the Proposal:

- Road Occupancy Licence from TfNSW and City of Sydney Council.

8.0 Conclusion and certification

8.1 Conclusion

This Review of Environmental Factors has been prepared to assess the environmental impacts of the proposed shared paths and public domain upgrades on Mitchell Road, Swanson Street, Buckland Street, Brown Street, Elliot Avenue, Park Street and Fox Avenue. This Proposal responds to the Cycling Strategy and Action Plan which has been developed by the City of Sydney to improve cycling access throughout City of Sydney LGA. The Proposal would generate benefits including:

- Improved journey time reliability for people riding bikes
- Improved amenity for pedestrians and people riding bikes due to enhanced public domain
- Improved integration with public transport
- Potential public transport de-crowding
- Improved equity and accessibility outcomes
- Potential for wider economic benefits beyond the transport sector
- Improved localised economic activity
- Reduced energy dependence.

This Review of Environmental Factors has been prepared in accordance with Part 5 of *the NSW Environmental Planning and Assessment Act 1979* and has assessed those matters listed in Clause 228 of the *NSW Environmental Planning and Assessment Regulation 2000*. The format of the report and level of environmental impact assessment also complies with the *City of Sydney Part 5 Environmental Impact Assessment Procedures* manual.

The Proposal complies with relevant State and local planning strategy and policy, specifically the City's *Cycling Strategy and Action Plan 2018*. This plan includes an objective to connect the network and make it safer for people to ride in Sydney. The Cycling Strategy and Action Plan was adopted by the City in 2007, and incorporated into the City's strategic plan, *Sustainable Sydney 2030.* The strategy aims to achieve the *Sustainable Sydney 2030* target for 10% of all trips in the city to be made by bike. The City has since planned and largely implemented the delivery of the first suite of cycle network projects and updated the Cycling Strategy and Action Plan in 2018.

The assessment has confirmed that the Proposal would not result in any significant impact on any declared critical habitat, threatened species, populations or ecological communities or their habitats. A Species Impact Statement is therefore not required. The assessment determined that the Proposal would improve local access and would integrate within the existing transport network.

The City would continue to work with affected landowners to minimise impacts during construction and operation and would also obtain the necessary permits and approvals by working together with stakeholders including Sydney Water (for utilities impacts) and Transport for NSW.

The public exhibition of this REF would provide an opportunity for the community, businesses and landowners to comment on the Proposal's impacts and benefits.

The REF has assessed key environmental and planning issues including traffic and transport, noise and vibration, non-Indigenous heritage and socio-economic impacts. Mitigation measures outlined in **Chapter 7.0** would also be implemented to minimise environmental impacts during the construction stage, which includes the preparation of a Construction Environmental Management Plan.

The recommended mitigation measures would ensure that the Proposal does not result in any significant adverse effect on the environment. In this regard, an Environmental Impact Statement is not required.

8.2 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.

Jessie Meyers

Environmental Scientist

AECOM

Date:

9.0 References

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Appendix A

Consideration of Matters of National Environmental Significance

The table below demonstrates City of Sydney's consideration of the matters of NES under the EPBC Act to be considered in order to determine whether the Proposal should be referred to the Commonwealth Department of the Environment and Energy.

Matters of NES	Impacts
Any impact on a World Heritage property? The Proposal would not impact any areas of World Heritage importance.	**Neutral**
Any impact on a National Heritage place? The Proposal would not impact any areas of National Heritage importance. The nearest National Heritage area is located at the Erskineville Station towards Eveleigh – the Greater Eveleigh Railway Precinct.	**Neutral**
Any impact on a wetland of international importance? The Proposal would not impact any areas of international wetland importance	**Neutral**
Any impact on a listed threatened species or communities? The following species listed under the EPBC Act are known or are considered to have the potential to occur within the project area: • *Ninox strenua* – Powerful Owl • *Pteropus poliocephalus*– Grey-headed Flying-fox If these species are in the locality during the construction, the works may have some potential to disturb these species during this phase. However as there would be no removal of trees or change to other habitats, there would be no impact during the operation phase.	**Minor – short term negative**
Any impacts on listed migratory species? The Proposal would not impact any listed migratory species.	**Neutral**
Does the Proposal involve a nuclear action (including uranium mining)?	**Neutral**

Matters of NES	Impacts
The Proposal would not involve nuclear action (including uranium mining).	
Any impact on a Commonwealth marine area? The Proposal Area is not located within or nearby a Commonwealth marine area.	**Neutral**
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal Area does not involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources.	**Neutral**
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal Area is not located within or nearby a Commonwealth land.	**Neutral**

Appendix B

Consideration of Clause 228

The table below demonstrates City of Sydney's consideration of the specific factors of clause 228 of the EP&A Regulation in determining whether the Proposal would have a significant impact on the environment.

Factor	Impacts
(a) Any environmental impact on a community? The Proposal is located within a moderately modified urban area and would not result in any environmental impact on a community. The environmental impact of the infrastructure would create long-term positive effects due to the reduction of motorists and vehicle emissions.	**Minor, short-term Negative** **Major, long-term Positive**
(b) Any transformation of a locality? The Proposal would transform a small portion of Mitchell Road, Buckland street, and Swanson Street. The change comes through the provision of active transport infrastructure and upgraded pedestrian facilities. The transformation is considered to be positive.	**Minor, long term Positive**
(c) Any environmental impact on the ecosystem of the locality? The Proposal exists in a significantly modified urban area. There are limited sightings of identified threatened bird species. While the construction stage could disturb species temporarily, given the existing environment is already highly urbanised, it is likely that the construction would not add to any further urban impact to ecosystems. .	**Negligable**
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The Proposal would result in a short-term reduction of the aesthetic of Mitchell Road, Buckland Street and Swanson Street and surrounds due to the presence of construction materials and equipment. However, the works are considered to have a long-term positive effect due to new kerbsides, retainment of trees and planter boxes.	**Minor, short term Negative** **Major, long term Positive**

Factor	Impacts
(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? The Proposal would have minor, indirect impacts upon items of heritage significance. In addition, the Proposal would have a minor positive impact for present or future generations through the provision of needed active transport infrastructure.	**Negligible**
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The Proposal exists in a significantly modified urban environment. The following species are known or are considered to have the potential to occur within the project area: • Ninox strenua – Powerful Owl • Pteropus poliocephalus– Grey-headed Flying-fox The Powerful Owl's habitat when sighted in urban environments is the upper canopy of old growth trees. As the Proposal is not removing any trees as part of the works, any potential habitat of the Powerful Owl in the area would not be affected. The Grey-headed Flying-fox's habitat when sighted in urban environments is typically within urban gardens and cultivated fruit crop. As the Proposal is not encroaching on either of these, the habitat of the Grey-headed Flying Fox would not be affected. Species may be suspectable to construction noise, lighting and other unnatural occurrences. However, given the existing environment is already highly urbanised, it is likely that surrounding species would be accustomed to such urban disturbances.	**Negligible**
(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 exists in a significantly modified urban environment. The following species are known or are considered to have the potential to occur within the project area: • Ninox strenua – Powerful Owl • Pteropus poliocephalus– Grey-headed Flying-fox The Proposal exists in a significantly modified urban area. Given the existing environment is already highly urbanised, it is likely that the Proposal (during construction or	**Negligible**

Factor	Impacts
operation) would not add to any further urban impact to ecosystems.	
(h) Any long-term effects on the environment? The Proposal is proposed as a transport solution to improve access in the area and active transport networks. The Proposal is aimed at encouraging a modal shift of transport to active transport, reducing the volume of vehicles within the City, thereby reducing vehicle emissions.	**Major, long-term positive**
(i) Any degradation of the quality of the environment? The Proposal exists in a significantly modified urban area. Given the existing environment is already highly urbanised, the Proposal (during construction or operation) would not add to any further degradation of the quality of the environment. The Proposal may enhance the quality of the environment through increased emphasis on active transport modes and the street scape and reduction of motor vehicle emissions.	**Major, long-term positive**
(j) Any risk to the safety of the environment? Construction of the Proposal poses risks to the safety of the environment, where works are unmitigated. This REF has proposed a number of mitigation measures aimed at reducing any risks to the environment.	**Negligible**
(k) Any reduction in the range of beneficial uses of the environment? The Proposal would provide for an increase in sustainable transport use and public domain enhancements would provide increased value to the area. The Proposal would ensure long term access improvements in the area.	**Moderate, long term positive**
(l) Any pollution of the environment? The Proposal would result in a minor increase in air pollution during the construction stage but could have long-term benefit of switching motorists to active transport which generates less pollution.	**Minor, short term Negative** **Major, long term Positive**
(m) Any environmental problems associated with the disposal of waste? A Waste Management Plan would be prepared to properly document and dispose of waste generated during the construction stage. Once operational the Proposal would not generate significant waste.	**Minor, short term Negative**
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	**Negligible**

Factor	Impacts
The Proposal is unlikely to increase demand on resources (natural or otherwise) that are, or are likely to become, in short supply.	
(o) Any cumulative environmental effect with other existing or likely future activities? Construction of the Proposal may coincide with the construction of a number of other cycleway Proposals in Sydney. Cumulative impacts as a result of concurrent development would be managed according to the measures outlined in Section 6.13.3.	**Minor, short term** **Negative**
(p) Any impact on coastal processes and coastal hazards, including those under Proposed climate change conditions? The Proposal is not located within or adjacent to the coastline and is unlikely to impact on coastal processes.	**Negligible**

Appendix C

Design Drawings