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Ashmore Street and Harley Street Cycleway
City of Sydney Council
06-Aug-2021

Review of Environmental Factors

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Ashmore Street and Harley Street - Ashmore Street and Harley Street Cycleway

Client: City of Sydney Council

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Table of Contents

Figures

Tables

Abbreviations

Abbreviation	Meaning
ASS	Acid Sulfate Soils
ASSMP	Acid sulfate soil management plan
BC Act	*Biodiversity Conservation Act 2016*
CBD	Central Business District
CEMP	Construction Environmental Management Plan
The City/Council	The City of Sydney Council
CLM Act	*Contaminated Land Management Act 1997*
CNVMP	Construction Noise Vibration Management Plan
CO	Carbon Monoxide
dB(A)	A weighted decibel
DPIE	Department of Planning, Industry and Environment
ESD	Ecologically Sustainable Development
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
ISCA	Infrastructure Sustainability Council of Australia
Km	Kilometres
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metres
MNES	Matters of national environmental significance
NO_2	Nitrogen Dioxide
NPI	National Pollutant Inventory
NPW Act	*National Parks and Wildlife Act 1974*
O_3	Ozone
OOHW	Out of hours work
Pb	Lead
PM	Particulate matter
POEO Act	*Protection of the Environment Operations Act 1997*

Abbreviation	Meaning
REF	Review of Environmental Factors
RT Act	*Road Transport Act 2013*
SDS	Safety Data Sheet
SEPP	State Environmental Planning Policy
SO_2	Sulfur Dioxide
Streets Code	City of Sydney Streets Code
TPZs	Tree protection zones
WARR Act	*Waste Avoidance and Resource Recovery Act 2001*
WMP	Waste Management Plan

1.0 Introduction

The City of Sydney proposes to deliver a new priority cycleway along Ashmore Street in Erskineville and Harley Street in Alexandria, as part of the broader Cycling Strategy and Action Plan. The new cycleway would comprise an arrangement of two-way cycleway, shared path, and cyclist priority shared road areas that provides a safer cycle network while maintaining vehicle and pedestrian access.

For the Ashmore Street and Harley Street cycleway project, 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 for the Project. The purpose of this REF is to describe the Project, assesses the potential environmental impacts of the Project, identify measures that avoid, minimise or mitigate those potential impacts, and to inform the decision on whether to proceed with the Project. The Project and associated environmental impacts have been considered 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 Project would not result in 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 Project

1.1.1 Background

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 of Sydney has invested an average of $11 million per annum to build a safe and connected bike network. This has resulted in the doubling of average cycling trips across Sydney.

The *Cycling Strategy and Action Plan – For a more sustainable Sydney 2018 – 2030* was prepared by the City of Sydney to guide planning and development decisions to make bicycle transport easier, safer, attractive, and a more feasible option for a greater number of people. This strategic planning document is discussed in greater detail in **Section 2.1.2**.

As part of the Bike Network, the City of Sydney proposes to provide a two-way cycleway in addition to a shared path, and cyclist priority shared road areas along Ashmore Street in Erskineville and Harley Street in Alexandria. The Project seeks to minimise additional infrastructure requirements whilst contributing positively to the safety, functionality and amenity of the streets for people on bikes, without compromising essential motorised vehicle operations, pedestrian space and the legibility of the street as an urban place. This Project is the subject of this REF.

1.1.2 Key features of the Project

The core deliverable of the Project would comprise the construction of a new cycleway. The new cycleway commences on Ashmore Street, just east of its intersection with Fox Avenue in Erskineville. The cycleway will be bi-directional along the northern section of Ashmore Street until its intersection with Mitchell Road. A new raised pedestrian and bicycle crossing on Mitchell Road will connect the cycleway between Ashmore Street and Harley Street. At Harley Street the cycleway becomes a one-way cycleway in both directions along both the northern and southern road edge. Both one-way cycleways along Harley Street continue until its intersection with Euston Road and McEvoy Street in Alexandria. For the purpose of this REF, the linear extent of the new cycleway along Ashmore Street and Harley Street is referred to as the alignment.

Other key features of the Project that would facilitate or support the construction of the new two-way cycleway on Ashmore Street and the new one-way cycleways on Harley Street include:

- Road and pavement adjustments, including modifications to existing kerb-lines and gutters, footpaths and ramps and the inclusion of pedestrian and cyclist crossings

- Continuous footpath intersection treatments at Fox Avenue and Ashmore Street
- New raised crossing across Ashmore Street at Fox Avenue
- Adjustment of some drainage pits and stormwater pipelines in association with kerb and gutter modifications. All new drainage pits and grating would be 'bike-safe'
- Removal and relocation of parking spaces
- Installation of new or replacement roadside furniture and signage
- Landscaping
- Relocation or adjustment of utilities and street lighting to suit approved design alignment of the cycleway and pedestrian crossings
- Provision of surface finish to the new cycleway in accordance with City of Sydney specifications
- New line marking on adjacent roads and on the cycleway.

1.2 Site analysis

1.2.1 Project location and context

The Project is located within the Sydney Local Government Area (LGA), in the suburb of Erskineville and Alexandria. The Project is located about four kilometres south of the Sydney CBD, about 600 metres north of Sydney Park and two kilometres west of Moore Park. The Eastern Distributor motorway is located about two kilometres east of the Project. Erskineville Oval is located adjacent to the northern verge of Ashmore Street. The location of the Project in a regional context is shown on **Figure 1-1**.

The Project would be located on Ashmore Street and Harley Street, and include works at the intersection with Mitchell Road as shown on **Figure 1-2**. The area surrounding the Project can be generally described as a developed modern urban environment, characterised by single and multi-story residential buildings, with commercial premises at street level. Street trees as well as landscaped/planted medians, verges and gardens can also be found along the extent of the alignment.

For the purpose of this assessment, the extent of the works as shown on **Figure 1-2** (defined by a red line) is referred to as the Project footprint. The Project footprint includes all areas where works would be undertaken and the locations of all ancillary facilities, including temporary construction material laydown areas.

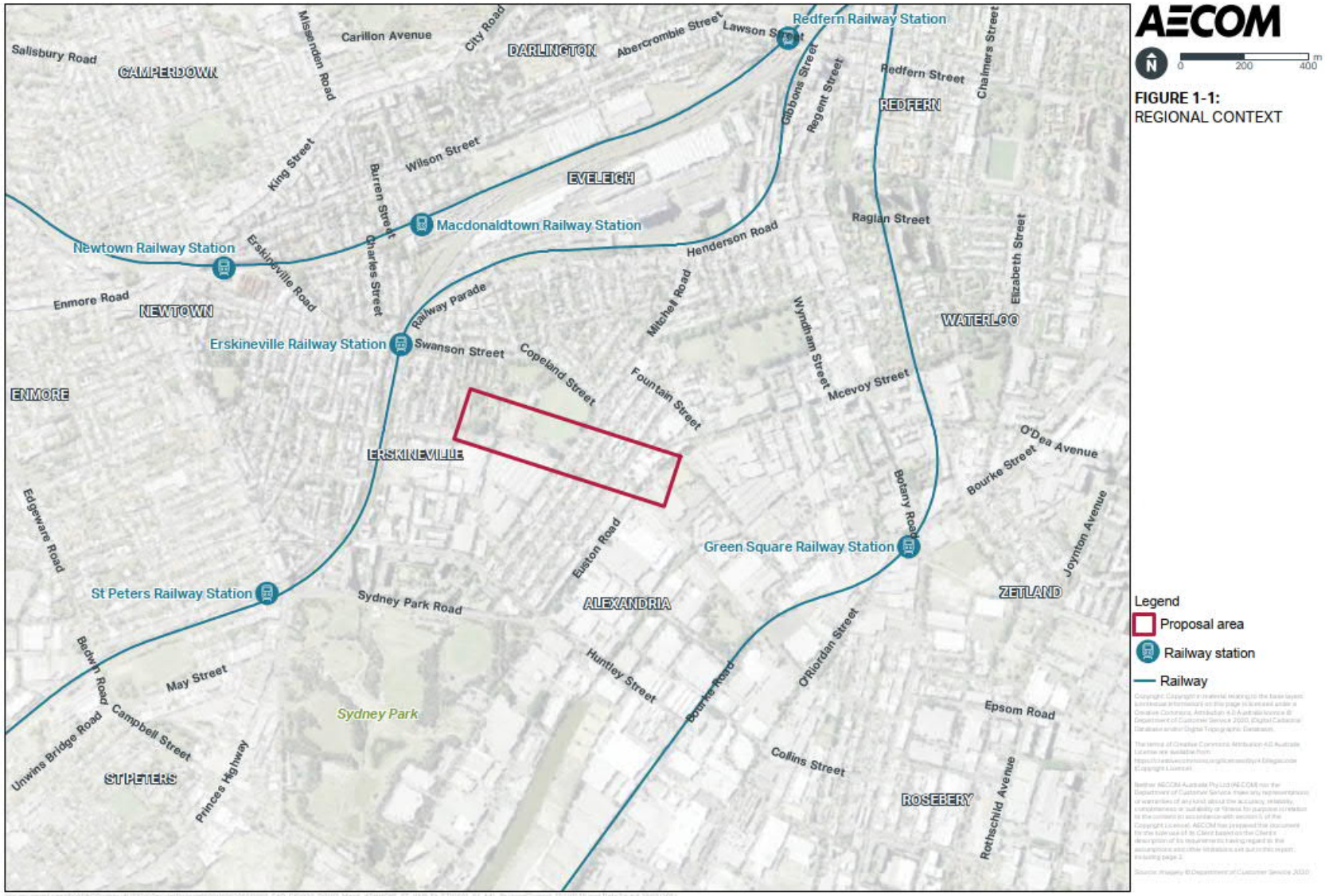

Figure 1-1 Regional context of the Project

Figure 1-2 Local context and Project footprint

1.2.2 Existing environment and surrounding land uses

Land uses surrounding the Project footprint include residential premises, food and drink premises, commercial and retail premises, recreational areas and a mixed use area.

Key sensitive receivers (land uses which are sensitive to potential noise, air and visual impacts) along the alignment primarily consist of the apartment complex located at the southern verge of Ashmore Street, and the numerous single and multi-level residential properties located on Harley Street. Other key sensitive receivers that have been identified along the alignment include:

- Ashmore Street – Erskineville Oval
- Ashmore Street – Alexandria/Erskineville Bowling Club
- Harley Street – Parkview Hotel
- Harley Street – Bowden Playground
- Harley Street – Petbarn Alexandria
- Harley Street – Victoria's Basement

Key existing infrastructure within the Project footprint includes:

- Underground electricity, stormwater, sewerage and telecommunications infrastructure
- Street lighting.

1.2.3 Existing zoning

The applicable land zoning for the Project is specified by the *Sydney Local Environmental Plan 2012* (Sydney LEP). The Project footprint is located within an area zoned as B2 – Local Centre, R1 – General Residential and B4 – Mixed Use.

Adjacent land zones to the Project footprint comprise the following:

- RE1 – Public Recreation.
- SP2 - Infrastructure (classified road).

The land zoning of the Project is shown in **Figure 1-3.**

1.2.4 Land ownership

The land on which work would be carried out is owned by the City of Sydney. The Project would not require the acquisition of any property.

Figure 1-3 Land use zoning of the Project

2.0 Need and options considered

This chapter discusses the need and objectives of the Project 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 Project and justification as to why the preferred option has been chosen.

2.1 Strategic justification

2.1.1 Overview

The provision of separated cycleways can have immediate and long-term impacts on usage, according to the *Inner Sydney Regional Bicycle Network Demand Assessment and Economic Appraisal* (AECOM 2010). Strong shifts in cycling demand have been observed where separated cycleway infrastructure has been constructed, for example, the development of two cycleways by the City on King Street and Bourke Road saw cycling levels increase by up to 30% immediately after opening.

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. 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 Project would be consistent with the policies and strategies described below.

Sydney City Centre Access Strategy

The NSW Government's *Sydney City Centre Access Strategy* was NSW's first detailed plan of how people will enter, exit and move in and around Sydney's city centre over the next 20 years (TfNSW, 2013). One of the key features of the strategy was to deliver an integrated cycleway network. The Project would align with the strategy as it would "meet the increased demands within the city centre and make better use of the available street space" and "support the continued growth in cycling within the city centre" (TfNSW, 2013).

Environmental Action 2016 – 2021: Strategy and Action Plan

Sustainable Sydney 2030 outlines the community expectation that Sydney LGA should be an environmental leader on a global scale. To guide the implementation of *Sustainable Sydney 2030*, 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 a separated, dedicated cycleway. The Project 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* (Cycling Strategy and Action Plan) outlines the vision for cycling in Sydney. This includes an objective to connect the existing cycleway network and make it safer for people to use. Actions to achieve this that are relevant to the Project 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
  - 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 cyclewears 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 the 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 its 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 Project 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 Project 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 within the area.

2.2 Project objectives

The objectives of the Project are consistent with those that are described for the delivery of the overall Cycling Strategy and Action Plan and aim to provide active transport infrastructure that supports the movement of people on bikes along Ashmore Street and Harley Street that is:

- Safe and functional
- Separated from general traffic and pedestrians
- Meets current and future community needs

- Prioritises people on bikes.

The proposed cycleway would be constructed within the existing road corridor between the existing kerbs. The Project 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 cycleway being constructed at Ashmore Street and Harley Street. This option would not achieve the Project objectives, nor would it achieve the City of Sydney's strategic objectives. Therefore the 'Do Nothing' option is not the preferred option.

Option 2 – Ashmore Street and Harley Street cycleway - Preferred Option

This option has bi-directional on Ashmore Street and conventional running on Harley Street. This option meets the objectives of the Project as well as the relevant strategy documents by increasing access and safety for people on bikes along Ashmore Street and Harley Street. It would also improve modal integration by developing infrastructure that ties in with and complements the wider transport network, inclusive of existing cycleway networks in the area.

Option 3 – Bi-directional on Both Ashmore and Harley Streets

The option for a bi-directional cycleway connection on both streets was explored but not progressed. The number of intersection crossovers on Harley Street with its side streets and laneways created a number of dangerous and confusing environments for cars, pedestrians and people on bikes.

Option 4 – Conventional running cycleway on both Ashmore and Harley Street

The option for conventional running cycleways on both of these streets was explored but not preferred. The reason for not putting conventional running on Ashmore Street was due to additional crossing/conflict points between cars and bikes west of Mitchell Road.

2.4 Project 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. 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.

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

- Travel time 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
- Cycling-specific benefits including improved public health and journey ambience.

The Project 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 Project description

This chapter describes the Project in detail and summarises key design features and construction methodology, timing and duration, as well as site access, ancillary facilities and utility adjustments. The description of the Project is based on the concept design and is subject to detailed design.

3.1 The Project

As described in **Section 1.1.2**, the primary feature of the Project involves the construction and operation of a bi-directional cycleway along Ashmore Street in Erskineville and two single-lane cycleways along Harley Street in Alexandria. To deliver the new cycleway, the following works would be required:

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

The general layout of these work elements are shown on **Figure 3-1** and the design drawings are located in **Appendix C**. Details of these proposed works are outlined in the following sections.

Figure 3-1 Proposed works over the Project area

3.1.1 Scope of works

Ashmore Street Works

- Construction of new cycleway would begin at Ashmore Street, just west of its intersection with Fox Avenue (see **Figure 3-1**)
- The new separated cycleway would comprise a dual lane path (eastbound and westbound bicycle lanes) and would travel adjacent to the northern footpath adjacent to Ashmore Street. The Ashmore Street cycleway would be about 140 metres in length (between Fox Avenue and Mitchell Road). The cycleway would be about 3 metres wide
- Demolition of the existing pavement at the Ashmore Street and Fox Avenue intersection and along the northern verge of Ashmore Street to allow for the construction of the cycleway and associated road infrastructure
- A raised pedestrian crossing would be installed over the Ashmore Street and Fox Avenue intersection
- Soft landscaping at the intersection of Ashmore Street and Fox Avenue along with soft landscaping just west of Mitchell Road
- Installation of new drainage pits at the intersection of Ashmore Street and Fox Avenue
- Removal of existing pavement markings and reinstated to suit the new road lane geometry
- Paint markings would be provided on the new cycleway to designate it as a cycleway, to provide directional arrows, and to delineate shared path areas (areas for both pedestrian and cyclist use).
- New signage would be established to designate the cycleways, shared path areas, relocated crossings, parking zones etc.

Harley Street and Mitchell Road Works

- After crossing the intersection of Ashmore Street and Mitchell Road the cycleway splits into two single-lane cycleways along the northbound and southbound verges of Harley Street, continuing in an eastbound direction for 250 metres until the intersection with McEvoy Street and Euston Road. Both cycleways would be about 1.5 metres wide
- A raised pedestrian and bicycle crossing would be installed over the Mitchell Road intersection, replacing the existing pedestrian crossing (currently at road level)
- A broken median kerb/separator (small raised concrete blocks placed at regular intervals) would be provided on Harley Street to separate the cycleway from the road
- Modifications to existing kerb-lines and gutters to tie in with the existing layout
- Installation of new drainage pits at the intersection of Harley Street and McEvoy Street
- Paint markings would be provided on the new cycleway to designate it as a cycleway, to provide directional arrows, and to delineate shared path areas (areas for both pedestrian and cyclist use)
- New signage would be established to designate the cycleways, shared path areas, relocated crossings, parking zones etc.

Landscaping and other works

No trees are proposed to be removed for the Project. Soft landscaping and mass planting would be undertaken throughout the Project area upon completion of construction of the cycleways. The majority of planting would occur at the following intersections:

- Ashmore Street and Fox Avenue
- Ashmore Street and Mitchell Road
- Harley Street and Mitchell Road
- Harley Street and McEvoy Street/Euston Road.

In addition to the above landscaping works, new signage would be established to designate the cycleways, shared path areas, relocated crossings, parking zones etc. Kerbside parking along Ashmore Street and Harley Street would also have to be reconfigured to suit the proposed cycleways.

Further detail is included in **Appendix C**.

3.1.2 Construction timing and duration

Subject to approval, construction is anticipated to commence in October 2021 and take about 6 months to complete. This REF is based on the concept design for the Project, 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 this REF, further assessment would be undertaken to consider new or altered environmental or amenity impacts.

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

- Monday to Friday, 7 am to 6 pm.
- Saturday, 8 am to 1 pm.
- 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, 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 into consideration Section 6 - Work practices of the NSW DECC Interim Construction Noise Guideline, and 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 Project includes:

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

3.1.4 Earthworks

Earthworks would be minor, resulting from removal of the surface layer of the pavement overlaying the proposed cycleway, widening and realignment of pavement, installation of garden beds, 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 would be associated with the installation of garden beds, footings and signage. Trench excavations for stormwater drainage and tree pits 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.

3.1.5 Source and quantity of materials

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

3.1.6 Construction traffic and access

Access to the Project would occur via the Eastern Distributor, Princes Highway and the existing local road network. Construction works would require the removal of kerbs, kerbside parking and road infrastructure on Ashmore Street and Harley Street however it is considered that the street can operate under traffic controlled contra-flow during this time. Temporary closure of Ashmore Street, Harley Street and Mitchell Road for re-construction of the pedestrian and cyclist crossing (potential to be nightworks over 1-2 nights) may be required. In addition, works may also require the closure of these roads during works during construction near intersections in these areas. Suitable traffic and access control measures would be identified in a traffic management plan (TMP) for the Project and would be developed in accordance with the relevant City of Sydney policy for the preparation of TMPs.

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 Project is not anticipated to exceed 30 light vehicles and five heavy vehicles per day during peak construction periods. In addition to the generation of vehicles the Project would also involve the operation of mobile plant and equipment.

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

3.1.7 Ancillary facilities

Construction of ancillary facilities such as construction compounds are not anticipated to be required for the Project. However, the Project would require a site shed, amenities for workers and may also need a small fenced area for storage. The site shed and associated fenced area and amenities would be located on the northern side of Ashmore Street, near Mitchell Road. Further, there is unlikely to be sufficient space to enable practical access for the works to support a full construction compound.

As an alternative, it is anticipated that sections of the Project 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 (about one parking space) 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 the vehicles, plant and equipment on site are 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 Project 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 and service providers 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.

3.1.9 Property acquisition

The Project would not require the acquisition of any property.

4.0 Statutory and planning framework

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

4.1 Commonwealth

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 – identified in the EPBC Act as matters of national environmental significance (MNES). The EPBC Act requires the assessment of whether the Project is likely to significantly impact MNES or Commonwealth land. These matters are considered in further detail in **Appendix A**.

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

4.2 State

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 Project is subject to the environmental impact assessment and planning approval requirements of Division 5.1 of the EP&A Act. Division 5.1 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 Project. Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) identifies the factors which must be considered when determining if an activity assessed under Division 5.1 has a significant impact on the environment.

Chapter 6.0 of this REF provides an environmental impact assessment of the Project 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 4-1 provides a list of other key relevant legislation applicable to the Project.

Table 4-1 Other key NSW legislation applicable to the Project

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 6.9** of this REF shows that potential impacts to biodiversity resulting from the Project would not be significant.
Contaminated Land Management Act 1997 **(CLM Act)**	Section 60 of the CLM Act imposes a duty on landowners to notify, 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 off-site facility.

Applicable legislation	Considerations
Heritage Act 1977 **(Heritage Act)**	The following sections of the Heritage Act are relevant to the Project. Sections 57 and 60 (approval) - where items listed on the State Heritage Register (SHR) are to be affected. Sections 139 and 140 (permit) - where relics are likely to be exposed. Section 170 - where items listed on a government agency Heritage and Conservation Register are to be affected. **Section 6.4** of this REF shows that potential impacts to non-Indigenous heritage resulting from the Project would not be significant.
National Parks and Wildlife Act 1974 **(NPW Act)**	Sections 86, 87 and 90 of the NPW Act require consent from the Department of Planning, Industry and Environment for the destruction or damage of Aboriginal objects. The Project would not result in the destruction or damage of known Aboriginal objects. There are no recorded Aboriginal objects at or near the Project Area. The mitigation measures proposed in **Section 6.5** would mitigate potential effects on identified Aboriginal heritage item.
Protection of the Environment Operations Act 1997 **(POEO Act)**	The Project does not involve a 'scheduled' activity under Schedule 1 of the POEO Act. However, in accordance with Part 5.7 of the POEO Act, City of Sydney would notify the EPA of pollution incidents that occur onsite. This would be managed in the Construction Environmental Management Plan (CEMP) to be prepared and implemented by the construction contractor.
Roads Act 1993 **(Roads Act)**	The Project would require works on Ashmore Street, Harley Street and Mitchell Road (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 the NSW Transport Management Centre to mitigate impacts to traffic flow as far as reasonably practicable.
Waste Avoidance and Resource Recovery Act 2001 **(WARR Act)**	City of Sydney would carry out the Project having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.

4.2.3 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) is the key environmental planning instrument (EPI) which determines the permissibility of a Project of this nature and how it is assessed under the EP&A Act. Clause 94 of the ISEPP allows for the development of 'roads and road infrastructure facilities' by or on behalf of a public authority without consent on any land and Clause 94(2)(c) specifically notes "*alterations or additions to an existing road (such as widening, narrowing, duplication or reconstruction of lanes…"* as development permitted without consent.

Clause 93 of the ISEPP defines 'road infrastructure facilities' as those relevant to 'road related areas', as determined by the *Road Transport Act 2013* (RT Act). The RT Act identifies 'road related areas' to include areas open to the public and designated for use by people on bikes. As such, the Project meets the definition of 'road infrastructure facilities' under Clause 93 of the ISEPP.

Therefore, in accordance the abovementioned Clauses of the Infrastructure SEPP, development consent is not required, and the Project is defined as 'development without consent' under Division 5.1 of the EP&A Act. However, it is still necessary and required to consider environmental impacts of the Project under Part 5 of the EP&A Act.

Part 2 of the ISEPP contains provisions for public authorities to consult with State Emergency Services and other public authorities prior to the commencement of certain types of development. **Section 5.0** of this REF discusses the consultation undertaken under the requirements of the ISEPP.

It is noted that the ISEPP 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 Project area or proposed activity and therefore do not require further consideration as part of this REF.

4.2.4 State Environmental Planning Policy 55 – Remediation of Land

State Environmental Planning Policy 55 – Remediation of Land (SEPP 55) provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. The provisions of SEPP 55 have been considered in the preparation of this REF.

Section 6.7 of this REF contains an assessment of the potential contamination impacts of the Project. It is unlikely that large-scale remediation (Category 1) work would be required as part of the Project. The Project does not require a change in land use and is unlikely to be affected by potential contaminants that occur beneath the road surface.

4.2.5 State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) *2017* (Vegetation SEPP) provides a mechanism for the protection of vegetation in non-rural areas of the State of NSW including the City of Sydney LGA. The policy aims to protect the biodiversity values of trees and other vegetation and preserve the amenity of non-rural areas of the State.

4.2.6 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005)

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour Catchment REP) provides a mechanism for protecting the catchment, foreshores, waterways and islands of Sydney Harbour. The Sydney Harbour Catchment REP intends to ensure that Sydney Harbour is a place that can achieve high quality ecological values and be a culturally rich and vibrant place for people. It seeks to balance natural environmental outcomes, with socio-economic objectives.

The key matters for consideration under the Sydney Harbour Catchment REP are:

- Biodiversity, ecology and environment protection.
- Public access to, and use of, foreshores and waterways.
- Interrelationship of waterway and foreshore uses.
- Foreshore and waterways scenic quality.
- Maintenance, protection and enhancement of views.
- Boat storage facilities.
- Floating boat platforms.
- Mooring pens.

With the exception of the potential for off-site runoff during the construction phase (refer **Section 6.10**), the Project is unlikely to directly affect the above key matters for consideration. The Project may have positive indirect effects including increasing the provision of access for active transport around the City to access foreshores and waterways.

4.3 Local

4.3.1 Sydney Local Environmental Plan 2012

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

Table 4-2 summarises the relevant aspects of the Sydney LEP applicable to the Project.

Table 4-2 Relevant provisions of Sydney LEP

Provision description	Relevance to the Project
Clause 2.3 – Zone objectives and Land Use Tables	The majority of works to be undertaken for the Project would be carried out on land zoned as B2 – Local Centre, R1 – General Residential and B4 – Mixed Use. The Project is consistent with the objectives of the land use zones and the Project would not affect surrounding land use zones.
Clause 5.10 – Heritage conservation	Clause 5.10 of 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 Project is located within the curtilage of heritage conservation area – C22 Erskineville Estate and C2 Cooper 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 Sydney LEP 2012 does not restrict or prohibit the carrying out of development, by or on behalf of a public authority, which is permitted to be carried out with or without development consent. The Project 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). The principles of ESD are generally defined under the provisions of clause 7(4) of Schedule 2 to the EP&A Regulation as:

- The precautionary principle – if there are threats of serious or irreversible damage, a lack of full scientific uncertainty should not be used as a reason for postponing measures to prevent environmental degradation.
- Intergenerational equity – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
- Conservation of biological diversity and ecological integrity – the diversity of genes, species, populations and their communities, as well as the ecosystems and habitats they belong to, should be maintained or improved to ensure their survival.
- Improved valuation, pricing and incentive mechanisms – environmental factors should be included in the valuation of assets and services.

The principles of ESD have been adopted by City of Sydney throughout the development and assessment of the Project. **Chapter 6.0** includes an assessment of the impact of the Project on a range of environmental factors, including greenhouse gas emissions and climate change. **Chapter 7.0** lists mitigation measures that incorporate ESD principles during the construction phase of the Project.

5.0 Consultation

Chapter 5.0 discusses the consultation undertaken to date for the Project and the consultation proposed for the future. This chapter discusses the consultation strategy adopted for the Project 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 ISEPP

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.

Table 5-1 provides information on consultation requirements under the ISEPP for the Project.

Table 5-1 ISEPP consultation requirements

Clause	Clause particulars	Relevance to the Project
Clause 15AA | Consultation with State Emergency Service – development with impacts on flood liable land	Where the Project: occurs on flood liable land – written notice must be given (together with a scope of works) to the State Emergency Service. A response to the notice received from the State Emergency Service within 21 days after the notice is given	The Project is not on flood liable land.

Clause	Clause particulars	Relevance to the Project
	must be taken into consideration.	
Clause 16 | Consultation with public authorities other than Councils	Where the Project: is *specified development* as outlined under Clause 16(2), being: • development adjacent to land reserved under the *National Parks and Wildlife Act 1974* • development on land zoned E1 National Parks and Nature Reserves • development adjacent to an aquatic reserve or a marine park • development in the foreshore area • development comprising a fixed or floating structure in or over navigable waters • development for the purposes of a health services facility, correctional centre or group home, or for residential purposes, in an area that is bush fire prone land.	The Project is not considered to be specified development under Clause 16 of the Infrastructure SEPP. Consultation with specified authorities is not required.

5.2 Consultation strategy

The consultation strategy for the Project 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 Project and have the opportunity to provide input.

The objectives of the consultation strategy are to:

- Provide accurate and timely information about the Project and REF process to relevant stakeholders
- Raise awareness of the various components of the Project and the specialist environmental investigations
- Ensure that the directly affected community is aware of the project and consulted where appropriate
- Provide opportunities for stakeholders and the community to express their view about the Project.
- 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 Consultation outcomes

The majority of comments on the proposed changes to Ashmore and Harley Streets were in support of the new links in this location; two-thirds of comments supported the initiatives, most commonly in either general terms, or citing reasons why safety had improved.

Comments in which qualified support was offered comprised around one-fifth of all comments on this proposal; in all comments safety or connectivity improvements were suggested.

Objections were few and focused on the perception that private vehicle users would be inconvenienced by the new cycle connections.

5.4 Ongoing consultation

Should City of Sydney determine to proceed with the Project, the Determination Report would be made available on the City of Sydney 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 Project.

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

6.0 Environmental Impact Assessment

This chapter provides an assessment of the likely environmental impacts associated with the construction and operation of the Project. For each likely impacted matter, the existing environment is characterized, an assessment of potential impacts is undertaken as to how the Project would affect the existing environment, and measures are identified to avoid, manage or mitigate those potential impacts.

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 Project on traffic, transport and pedestrian and cyclist access within and surrounding the Project area. The assessment is based on a desktop analysis. Detailed traffic counts and modelling were not considered necessary for the Project.

6.1.1 Existing environment

Public transport

The closest train station to the Project area is Erskineville which is about 480 metres to the north west of the Project. Green Square Station is the next closest station and is located about 870 metres east of the Project. These stations also provide opportunity to access and travel between other transport modes including buses, taxis and rideshare.

In addition to train services, near the Project area, the closest bus services are on Mitchell Road and McEvoy Street and include:

Mitchell Road

- Route 308: Marrickville Metro to Central Eddy Avenue via Redfern.
- Route 370: Coogee to Leichardt Marketplace
- Route 656E: Brigidine College Randwick to Sydney Park, St Peters

McEvoy Street

- Route 305: Mascot Stamford Hotel to Redfern

Road network and traffic

Ashmore Street and Harley Street are situated between Fox Avenue to the west, McEvoy Street and Euston Road to the east and Copeland Street to the north. There is currently no formal provision of cyclist facilities along these streets. Instead people on bikes share traffic lanes with other vehicles. The closest existing cycleway is located on Bridge Street, 400 metres west of the Project.

Within the Project area, Ashmore Street is an east-west road which consists of one lane in each direction with lane markings only apparent as the road comes to its intersection with Mitchell Road at its eastern extent. Ashmore Street becomes a no through road for vehicles at its intersection with Binning Street, with only cyclists and pedestrians permitted to continue travelling west towards Bridge Street.

Harley Street is an east-west road which consists of one lane in each direction. Lane markings are present at its intersection with connecting roads, including Mitchell Road, Lawrence Street and Euston Road and McEvoy Street. Numerous bicycle lane markings are provided throughout the road, despite no formal cycleway existing.

Traffic lights do not control movements into or out of Ashmore Street or Harley Street.

Access

On a local scale, Ashmore Street is used to connect Fox Avenue with Mitchell Road and provides pedestrian and cyclist access to Erskineville Oval and the western portion of Ashmore Street. It also provides access to a number of residential properties. Harley Street is used to connect Mitchell Road

with McEvoy Street and Euston Road and also a number of connecting side streets. Footpaths are located on both sides of each road within the Project area.

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

- Users (pedestrians, motorists, people on bikes) of Ashmore Street, Harley Street and Mitchell Road
- Users of Erskineville Oval and Bowden Playground
- Residences of Ashmore Street and Harley Street
- Commercial properties on Harley Street.

Kerbside use

Driveways are located on both sides of Harley Street for both residential and commercial properties. Driveways are only present on the southern side of Ashmore Street. Parking is generally permitted on both sides of Ashmore Street and Harley Street, other than where prohibitions have been introduced to facilitate access to/from premises or where additional network capacity is required such as on approach to intersections to facilitate turning movements.

A range of dedicated/authorised parking zones exist at various locations throughout the Project area, including:

- Time-restricted parking zones
- No Parking zones
- No Stopping zones

6.1.2 Potential construction impacts

Public Transport

The Project would not affect the location of, or access to, any bus stops.

The bus services using Mitchell Road and McEvoy Street may experience minor delays during construction but would otherwise not be affected. The proposed works are unlikely to affect the surrounding public transport network.

Road network and traffic

During construction, traffic flows along sections of Ashmore Street, Harley Street and Mitchell Road would be subject to temporary disruptions to allow for construction vehicle access and deliveries of construction materials and equipment.

Construction works would require the removal of kerbs, kerbside parking and garden beds on Ashmore Street and Harley Street, however it is likely that the street can operate under traffic controlled contra-flow during this time. Temporary closure of Ashmore Street and Mitchell Road for construction of the raised pedestrian and cyclist crossings (potential to be nightworks over 1-2 nights) may be required.

These disruptions would result in temporary delays or diversions for vehicles and people on bikes seeking to travel along Ashmore Street and Harley Street. The impacts of these disruptions would be minimised through the implementation of traffic control measures during construction.

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

Construction of the Project would be planned in coordination with the NSW Transport Management Centre to ensure that these impacts are minimised. Suitable traffic and access control measures would be identified in a traffic management plan (TMP) for the Project and would be developed in accordance with the relevant City of Sydney policy for the preparation of TMPs.

Access

There are several properties that have driveway access directly onto Harley Street within the Project area. No driveways are situated on Ashmore Street. During construction there would be potential

short-term disruptions for access to and from these properties. This may result in the loss of access to driveways for short periods, such as during resurfacing works. Businesses and residents would be notified in advance of temporary changes to their driveway access arrangements

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

On this basis access impacts are considered to be minor and short-term.

Kerbside use

The Project would result in changes to the existing kerbside use along Ashmore Street and Harley Street, including on-street parking. Parking along the northern verge of Ashmore Street and both side of Harley Street would be temporarily suspended during construction. All but four of these spaces on Ashmore Street would be reinstated upon completion of construction. All but 15 of the parking spaces along Harley Street would be reinstated upon completion of construction.

6.1.3 Potential operation impacts

Road network and traffic

The proposed lane configurations along Ashmore Street and Harley Street (with the cycleway in operation) have been designed to accommodate the additional traffic volumes associated with the implementation of the projects outlined in the Access Strategy. The Project would continue to support the safe and functional use of Ashmore Street and Harley Street as a key public transport priority corridor whilst achieving the Project objectives of prioritising people on bikes and meeting current and future community needs.

Access

The Project would provide a positive operational impact by connecting people on bikes directly to other existing parts of the cycleway network, as outlined in the Access Strategy.

The Project would not result in substantial operational changes to driveway access for the businesses and residents fronting the Project area, with all existing driveway access maintained.

Kerbside use

The Project would result in the permanent removal of existing kerbside usages, including some on-street parking. Six of approximately 38 unrestricted parking spaces present on Ashmore Street would be permanently removed, with 12 of 31 residential parking spaces on Harley Street also being removed. One car spot will be reinstated on the southern side of Harley Street between Mitchell Road and Belmont Street.

The removal of existing kerbside usages would increase the strain on parking availability throughout the area. The removal of existing kerbside usages may affect businesses directly fronting the Project area due to a reduced capacity for parking and loading and the limited availability of alternative kerbside locations. By provision of a cycleway which provides increased safety measures of bike riders, the Project may encourage a modal shift to bike riding as an alternative transport mode to driving. This in turn may lessen the impact of parking removal.

6.1.4 Mitigation measures

The following mitigation measures have been identified to minimise traffic and transport impacts:

- A TMP will be prepared and implemented as part of the CEMP. The TMP would include:
  - Confirmation of haulage routes
  - Measures to maintain access to local roads and properties
  - Site specific traffic control measures (including signage) to manage and regulate traffic movement
  - Measures to maintain pedestrian and cyclist access

- Requirements and methods to consult and inform the local community of impacts on the local road network
- Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads.
- A response plan for any construction traffic incident
- Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic monitoring, review and amendment mechanisms

- 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 controls.
- During construction, arrangements would be made to ensure access to businesses and other commercial or residential premises adjacent to construction areas would be maintained where possible.
- During construction, affected businesses and the occupants of other commercial and residential premises would be notified in relation to temporary access restrictions or limitations.
- Business owners and residents would be informed of changes in kerbside use, including the permanent loss of, or change in, existing loading and on-street parking spaces.
- A cyclist communication strategy would be implemented that would include establishing information signs and maps to inform cyclists of changes to cycleways within the city centre.

6.2 Noise and vibration

A noise and vibration assessment was undertaken for the Project using the Roads and Maritime Services' 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. **Table 6-1** is taken from the ICNG and presents noise management levels (NMLs) for noise at sensitive receivers and how they should be applied.

Table 6-1 Construction noise management levels – Residential receivers (from the ICNG)

Time of day	Construction noise management level $L_{Aeq,15min}$	How to apply
Recommended standard hours: • Monday to Friday 7am to 6pm. • Saturday 8am to 1pm. • No work on Sundays or public holidays.	Noise affected RBL + 10 dB(A)	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq,15\ min}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially affected residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise.

Time of day	Construction noise management level $L_{Aeq,15min}$	How to apply
		Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: • times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. • if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB(A)	• A strong justification would typically be required for works outside the recommended standard hours • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see Section 7.2.2 of the ICNG.

Notes:

1 Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the property boundary is more than 30 metres from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 metres of the residence. Noise levels may be higher at upper floors of the noise affected residence.

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 Project would involve work being carried out during the day as well as outside normal work hours. 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 before midnight and less noisy (such as pavement work) work may then continue throughout the night.

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 Project is situated in an inner-city suburb to the south of the Sydney CBD. 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 and sports. As a result, most nearby receivers would not be accustomed to the background noise levels required by the proposed works.

It should be noted that works during sensitive times would be intermittent, as works would progressively move along the proposed cycleway route along Ashmore and Harley Streets.

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

- Commercial receivers on Harley Street

- Residential receivers along Ashmore Street and Harley Street
- Recreational receivers at Erskineville Oval and Bowden Playground.

6.2.2 Potential construction impacts

Construction noise

A distance-based (scenario) assessment type was selected for this Project to assess the construction noise impacts. The assessment was carried out on the 28 May 2021 and is shown in

Appendix D. As the nosiest activity in the Project, the 'paving and asphalting' scenario was used in the assessment to determine noise impacts. 'R3' background noise environment was selected based on the road volumes within and surrounding the Project area.

Table 6-2 below provides the background noise levels (also referred to as Rating Background Level (RBL)) and noise management levels.

Table 6-2 Noise Area Category Table

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

Notes: [1] L_{A90} = Background noise level

[2] Noise Management Level for works during standard hours = Background level plus 10 dB(A)

Noise Management Level (NML) for out of hours works = Background level plus 5 dB(A).

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 Project area, while NCA2 captures areas between 35 and 180 metres from the Project area.

The results below show the noise management levels (NML in 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 identify certain mitigation measures.

It should be noted that not all additional mitigation methods have been applied to the Project. Based on a review of additional mitigation measures and their application to the Project, the additional mitigation measures 'N' (in bold text) are recommended to apply to this Project. As described above, works during sensitive times would be intermittent and would progressively follow the proposed cycleway route along Ashmore Street and Harley Street. Respite periods as recommended by the noise calculator tool would therefore be counterproductive for this Project as sensitive receivers impacted by construction works would change when works are required outside of standard hours. These are defined below in **Section 6.2.4**.

The results of the construction noise assessment for the day time are summarised in **Table 6-3** and for the night time are summarised in **Table 6-4.**

Table 6-3 Catchment distances affected by construction noise (day)

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	**Notification (N)**, Phone Calls (PC), Respite Offer (RO)
NCA1 (20m) – in line of sight	60	75	**N**, PC, RO

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

Table 6-4 Catchment distances affected by construction noise (night)

Catchment distances	Night		
	NML, dB(A)	Predicted noise levels, dB(A)	Recommended additional mitigation measures
NCA1 (35m) – in line of sight	45	70	Alternative accommodation (AA), **N**, PC, Specific Notification (SP), Respite Period 2 R2, Duration Respite (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**

Vibration

Sources of ground vibration associated with the Project are considered 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 6-5 provides a guide for recommended safe working distances for typical vibration intensive plant and equipment. The safe working distances presented apply to cosmetic damage of typical buildings under typical geotechnical conditions.

Table 6-5 Recommended Safe Working Distances for Vibration Intensive

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 tonnes 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.

6.2.3 Potential operation impacts

The Ashmore Street and Harley Street cycleways would accommodate non-motorised active transport which would not introduce any new noticeable sources of noise.

Over time, the cycleways have the potential to encourage a mode shift of travel in this area from motorised vehicles to bicycles and other active transport methods. This has the potential to reduce the number and/or frequency of vehicles travelling along Ashmore and Harley Streets, and other surrounding streets in the Project area. As these vehicle movements are the primary source of noise and vibration in this location, this change in transport mode would result in a major reduction in noise and vibration generally.

Therefore, no adverse operational noise and vibration impacts are considered likely to occur at the new cycleway locations and as such operational noise and vibration has not been considered further in this assessment.

6.2.4 Mitigation measures

The following mitigation measures have been identified 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, 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
- 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 include:
  - A map of the sensitive receiver locations including residential properties.
  - A work program to manage night noise impacts.
  - Safeguards and management measures to manage out of hours working.
  - An assessment to determine potential risk for activities likely to affect receivers, including for activities undertaken during and outside of standard working hours.
  - A process for assessing the performance of the implemented safeguards and management measures.
- Work is to be restricted to standard working hours and where possible, noisy work should be undertaken during less sensitive periods
- 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 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 complaints or queries regarding construction.
- Plant would be turned off when not in use.
- 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.
- Make the construction program available to the community and ensure it is routinely updated as works progress.

6.3 Landscape and visual

6.3.1 Existing environment

The Project area is located within an urbanised environment in the Sydney suburbs of Erskineville and Alexandria. The new cycleway would commence on Ashmore Street, just west of its intersection with Fox Avenue in Erskineville. It would travel east along the northern side of Ashmore Street, continuing across Mitchell Road where it splits in to two single-lane cycleways on both the northern and southern verges of Harley Street until its intersection with McEvoy Street/Euston Road.

The existing roads are as follows:

- Ashmore Street (including Fox Avenue intersection) – A two way (east and west) trafficable road. The road is lined with high-rise residential properties adjacent to the southern verge and Erskineville Oval to its north
- Harley Street (including the Mitchell Street intersection) – A two way (east and west) trafficable road. The street is lined with 1-2 storey residential properties along its northern and southern verges with commercial properties up to three storeys located at its eastern and western extents.

The area surrounding the Project can be generally described as a developed modern urban environment, characterised by new multi-story apartment buildings, low-rise residential properties of a range of ages and commercial premises scattered throughout.

Street trees as well as landscaped/planted medians, verges and gardens are also found along the extent of the alignment.

Changes to the existing visual landscape of the Project area would be noticeable to a range of permanent and temporary receivers. Permanent receivers include occupants of the range of buildings flanking Ashmore Street and Harley Street with occupants being residents, workers and frequent visitors of those buildings. Temporary receivers include pedestrians, occupants of vehicles, people on bikes, customers of the commercial properties scattered throughout the Project area and visitors throughout the area, including users of Erskineville Oval.

6.3.2 Potential construction impacts

The construction of the Project would temporarily change the appearance of 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 Ashmore Street and Harley Street 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 Project 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 landscapes of Ashmore Street and Harley Street are 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 lighting level 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 light generated from these towers, although focused and directed to the ground level, would be visible from occupancies on higher levels of the buildings flanking Ashmore Street and Harley Street. The effect of the lighting would reduce, the higher the occupancy is located from the street. As Ashmore Street and Harley Street already feature lighting at night in the form of street lights, traffic lights, vehicle head lights and light spill from street-level premises, the lighting towers would not substantially alter existing conditions and as such, the overall effect of the lighting towers is considered to be a minor, negative impact.

6.3.3 Potential operation impacts

The visual appearance of the Project area would be permanently changed as a result of:

- Introduction of the two-way cycleway on the northern verge of Ashmore Street
- Introduction of two single-lane cycleways on both the northern and southern verge of Harley Street and the introduction of a new pedestrian and cyclist crossing across the Mitchell Road intersection
- Altered traffic lane markings and arrangements
- Removal of trachyte and bluestone kerbs
- Alteration of existing intersection arrangements
- Introduction of street furniture
- Widened footpaths
- New roadside and cycleway signage
- New soft landscaping including garden beds.

Changes to the visual amenity of the Project area are considered to be negligible as the proposed elements are common elements of Sydney's urban environments and would not be visually intrusive in terms of bulk, form colour or texture. Whilst the cycleway infrastructure would comprise a 'new' element in the streetscape, over time this perceived 'newness' would recede and blend more consistently with the remainder of the existing streetscape elements.

The Project would also result in minor benefits to the visual environment. The reduction in parked vehicles would reduce visual clutter within the streetscape and would provide extended sight lines for pedestrians, people on bikes and drivers. This would act to draw attention more to the built environment, including buildings and the street environment itself. Further, new soft landscaping including new garden beds, at the corner of McEvoy Street, on Harley Street, at the intersection of Harley Street and Mitchell Road, and at the intersection of Ashmore Street and Fox Avenue will increase greenery and therefore visual amenity in the area. The presence of the cycleway may also encourage a shift in transport modes used by workers and residents in this area towards cycling. This would further reduce the number of vehicles travelling through the area and contribute to an improvement in the overall streetscape.

Overall, the Project is considered to have a minor, positive visual impact upon the Project area.

6.3.4 Mitigation measures

The following mitigation measures have been identified 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.
- Removed kerbs would be replaced with the same material where possible. If that material is not available, the kerb would be replaced with a stone material consistent with streetscapes around the City of Sydney in accordance with the *Sydney Streets Code* (City of Sydney, 2013).
- Design of new elements would be designed in accordance with *Sydney Streets Code* (City of Sydney, 2013) as applicable.

6.4 Non-Indigenous heritage

This section assesses and describes the impacts of the Project on non-Indigenous heritage within and surrounding the Project area. This assessment is based on a desktop analysis of the relevant heritage registers. The Project 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 April and June 2020 to identify potential non-Indigenous heritage items located within the Project 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
- *Sydney Local Environmental Plan 2012.*

Heritage items identified in **Table 6-6** and **Table 6-7** were found within a 500 metre buffer of the Project area.

Table 6-6 National heritage items surrounding the Project area

Heritage register	Heritage item	Distance from the Project
Australian Heritage Places Inventory	Greater Eveleigh Railway Precinct	500 metres north west of the Project area

Given the separation of the above heritage items from the Project area, no further assessment is required.

A number of non-Indigenous local and State heritage items are present within and adjacent to the Project area as described in **Table 6-7** and **Figure 6-1**.

Table 6-7 State and local heritage items near the Project area

Item	Address	Listing	Significance	Location relative to the Project
Inside the proposed works area				
Erskineville Estate General Conservation Area	Ashmore Street, Erskineville	Sydney LEP C22	Local	Within the Project area on Ashmore Street.
Cooper Estate General Conservation Area	Harley Street, Alexandria	Sydney LEP C02	Local	Within the Project area on Harley Street
Outside the proposed works area				

Item	Address	Listing	Significance	Location relative to the Project
Electrical substation	1A Ashmore Street, Erskineville	Sydney LEP I603	Local	10 metres south of the Project area
Electrical substation No. 117	16 Euston Road	Sydney LEP I2232	Local	60 metres south east of the Project area
Malcolm Estate General Conservation Area	Ashmore Street	Sydney LEP C24	Local	80 metres west of the Project area
Industrial building 'Eclipse House'	8-22 Bowden Street	Sydney LEP I9	Local	200 metres north east of the Project area
Kingsclear General Conservation Area	Swanson Street/Copeland Street	Sydney LEP C3	Local	250 metres north of the Project area
Industrial building 'Frank G Spurway'	20-30 Maddox Street	Sydney LEP I20	Local	260 metres south of the Project area
Terrace Group	50 Malcolm Street	Sydney LEP I618	Local	300 metres north west of the Project area
Cottage	54 Jennings Street	Sydney LEP I19	Local	310 metres north of the Project area
Terrace Group	6-18 Malcolm Street	Sydney LEP I616	Local	330 metres north west of the Project area
St Mary's Church group	21-23 Swanson Street	Sydney LEP I627	Local	330 metres north west of the Project area
Western part of former Alexandria Spinning Mills	58-68 Euston Road	Sydney LEP I2233	Local	330 metres south of the Project area
Terrace Group	41-45 Malcolm Street	Sydney LEP I617	Local	340 metres west of the Project area
Terrace Group	2 Malcolm Street	Sydney LEP I615	Local	350 metres north west of the Project area
Erskineville Public School	13 Swanson Street	Sydney LEP I626	Local	350 metres north west of the Project area
Terrace Group	1-10 Bridge Street	Sydney LEP I604	Local	390 metres north west of the Project area
Terrace Group	18-18 Clara Street	Sydney LEP I607	Local	400 metres north of the Project area

Item	Address	Listing	Significance	Location relative to the Project
Terrace Group	91-95 Mitchell Road	Sydney LEP I26	Local	400 metres north of the Project area
Terrace Group	79-89 Mitchell Road	Sydney LEP 125	Local	410 metres north of the Project area
Terrace Group	36 Swanson Street	Sydney LEP I628	Local	420 metres north west of the Project area
Former Chimney Stack Factory	127 Railway Parade	Sydney LEP I2247	Local	440 metres north west of the Project Area
North Alexandria Industrial General Conservation Area	Near Balaclava Lane and McCauley Street	Sydney LEP C74	Local	440 metres north east of the Project area
Terrace Group	91-105 Railway Parade	Sydney LEP I620	Local	460 metres north west of the Project area
House "Eveleigh House"	39 Brandling Street	Sydney LEP I10	State	490 metres north of the Project area
House	134 George Street	Sydney LEP I612	Local	500 metres north west of the Project area

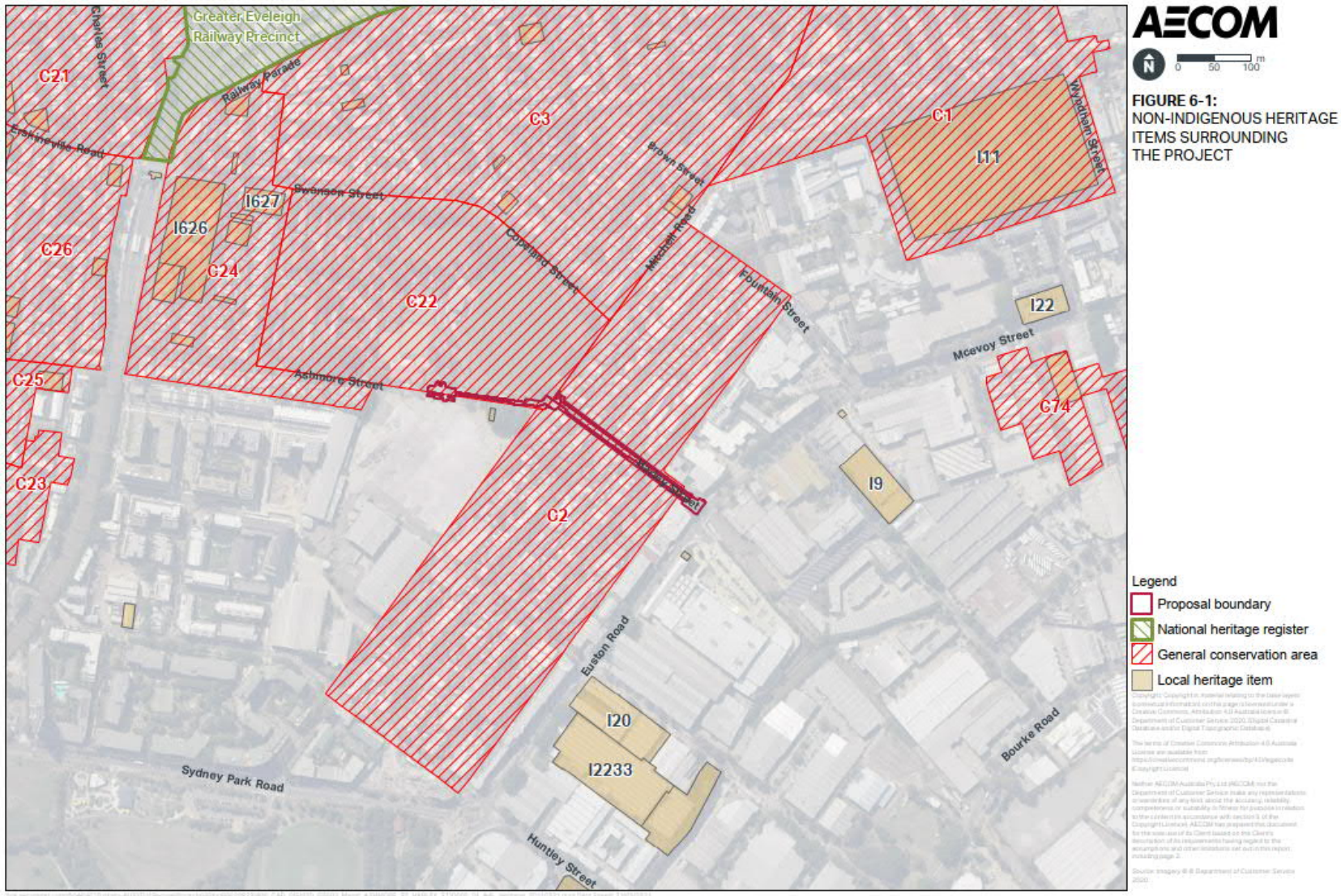

Figure 6-1 Non-Indigenous heritage items nearby the Project area

6.4.2 Potential construction impacts

Heritage items located adjacent to the Project area are likely to experience indirect impacts as a result of the proposed construction activities. Indirect impacts refer 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 within the Project area are summarised in **Table 6-9** and described 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 6-8**.

Table 6-8 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 6-9 Potential construction impacts to local heritage items as a result of the Project

Heritage Item	Description	Heritage impact assessment
C22 - Erskineville Estate General Conservation Area	The conservation area comprises essentially Erskineville Park and Erskineville Housing Scheme. Erskineville Park comprises: (1) Erskineville Oval This is bounded by Copeland Street, Mitchell Road, Fox Avenue and Ashmore Street, and contains a large oval with grandstand. The grandstand accommodates three levels and features simple window and brickwork details. Surrounding the oval is a sloped sandstone retaining wall, approximately 1-2m high which retains the grassed bank around the oval. There are a	There would be minor to negligible direct impacts to the heritage area as works are only limited to the road corridor, footpaths and kerbside structures. There is potential for buildings within the general conservation area 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
	number of significant plantings including the Pork Jackson Figs on Ashmore Street, which are likely to have been planted along the original boundary of the park, Eucalyptus trees planted on the boundaries of the oval and a band of Lombardy Poplars which form a strong end to the north-east corner of the Oval, accentuating the broadly banked landform. (2) Harry Noble Reserve The is located on the southern side of Fox Avenue and adjoins the Lady Gowrie Child Care Centre and Bowling Club. It includes a large grassed open space. There are a number of Eucalypts on the western edge of the reserve and Peppermint Trees on the eastern edge. In the reserve there are number of features including a children's playground and a picnic area. (3) Alexandria- Erskineville Bowling club This adjoins the Harry Noble Reserve. There are three Norfolk Island Pines in the grounds. Erskineville Housing Scheme (Based on Lumby (2002). The Erskineville Housing Scheme is bounded by Swanson Street, Elliott Avenue and Binning Street. It consists of seven two-storey brick buildings each containing eight flats. The buildings have two separate entrances that give access to four flats each and are arranged in parallel rows of two with wide spaces between the rows, and are oriented towards the east and the west. The drying courts are still in place between the blocks. External walls are constructed of dichromatic textured brickwork. Darker toned bricks form a base, and portions of some courses are recessed for decorative effect. Joints are raked at ground floor level and flush finished at first floor level. Hipped roofs are lined with corrugated steel sheeting. Entries to the blocks are disguised by cantilevered canopies and brick planter boxes on either side of small flights of stairs. The planter boxes are constructed of darker toned bricks, as are piers on either side of the entries.	

Heritage Item	Description	Heritage impact assessment
	The Lady Gowrie Child Care Centre comprises the original two storey building of brick construction with a terracotta tiled roof with flat roof pavilions at either end containing narrow tall windows. A long single storey wing with hipped roof extends across one side to the two storey section. The building features timber framed windows, with timber canopies installed on west facing first floor windows. There have been later buildings erected on the site. The Centre visually relates to the flats in the housing scheme. In the grounds of the centre is a significant oak tree.	
C02 - Cooper Estate General Conservation Area	The area comprises all but Euston Road fronting properties within the Cooper Estate, and still largely reflects the regular 1880s subdivision pattern. Residential development includes Victorian cottage semis, Victorian and Federation terrace house and inter-war semi-detached houses. The area has an overlay of small-scale industrial and warehouse development from the Victorian, Federation and inter-war periods on amalgamated sites. These reflect the growth of industry in the area during the early twentieth century.	There would be minor to negligible direct impacts to the heritage area as works are only limited to the road corridor, footpaths and kerbside structures. There is potential for buildings within the general conservation area 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.
I603 – Electrical substation	A single storey Inter-War Stripped Classical style building with tuck pointed face brick. Decorative elements include a single cement rendered cornice extending above all openings and a large identity plaque surmounting the steel roller shutter identifying the building "S.M.C ELECTRIC LIGHTING SUBSTATION No.101". Bullnose bricks are used at the architraves and windowsills and a blank arched opening surmounts one window. The side and rear walls are of rendered brickwork.	There would be no direct impacts to this heritage item as it is not located within the Project area. Indirect impacts to the heritage item are anticipated to be minor. Indirect impacts to the heritage item are considered to be minor. There is potential for the item 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) will be conducted.

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. In addition, the presence of construction machinery would likely affect the landscape character and visual amenity temporarily.

It should be noted that the Erskineville Estate and Cooper Estate general conservation areas and local heritage item I603 – Electrical substation are the closest heritage items to the proposed works. The

next closest heritage item is I2232 - Electrical substation No. 117, which is located about 60 metres east of the Project area. Impacts to the other heritage items identified in **Table 6-7** are considered unlikely and further impact assessment on these items is not necessary.

6.4.3 Potential operation impacts

During operation, impacts to non-Aboriginal heritage items would be largely experienced as changes to landscape character and visual amenity. As outlined above, this impact is considered to be minor positive. As such adverse non-Indigenous heritage impacts are not considered likely.

6.4.4 Mitigation measures

The following mitigation measures have been identified to minimize impacts to non-Indigenous heritage items:

- If inadvertent damage occurs to heritage items in the vicinity of the Project area due to vibration or other works, the damage must be reported immediately to the City of Sydney Project Manager and City of Sydney Environmental Officer who may consult with 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 construction of the proposed development, Protection Zones would be required in all areas where construction works abut a heritage item.
- All relevant construction staff, contractors and subcontractors must be made aware of their statutory obligations for heritage under the NSW *Heritage Act 1977* to ensure archaeological remains or heritage fabric are not inadvertently affected during the proposed works. 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 Project area during construction, the unexpected find procedure will be followed and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the City of Sydney Project 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 potential impacts of the Project on Indigenous heritage within and surrounding the Project area. A desktop assessment was undertaken to determine whether the Project 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 Project 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 27 May 2021. The AHIMS search did not identify Aboriginal heritage items within or adjacent to the Project area (one kilometre buffer) (refer

Appendix E).

The Project area does not contain landscape features that indicate the presence of Indigenous heritage objects and the cultural heritage potential of the Project 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 Project, as:

- No Aboriginal sites have been previously identified within the Project area
- The Project area has previously undergone extensive landscape modification and a high level of disturbance from urban development within and adjacent to Ashmore Street and Harley Street.

The Project area has been previously disturbed as a result of the original construction of Ashmore Street, Harley Street, 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 Project area has also been subject to past disturbance with the introduction of fill materials, levelling, installation of utilities and services (both subsurface and aboveground) and roadside landscaping. Therefore, there is a low likelihood that the Project would affect previously unidentified culturally sensitive items within the Project area.

The Project 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 Project, the Unexpected Finds Procedure would be implemented.

6.5.3 Potential operation impacts

Once operational, the Project would not affect Indigenous heritage.

6.5.4 Mitigation measures

The following mitigation measures have been identified for application to the Project:

- 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 Indigenous cultural heritage material and sites.
- If unforeseen Indigenous objects are uncovered during construction, the 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 Project 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 would be 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 Socioeconomic impacts

6.6.1 Existing environment

Population and growth

At the 2016 Census, the suburb of Erskineville had a population of 8,014 and the suburb of Alexandria had a population of 8,262 people, while the wider Sydney LGA had a population of 208,374 people. The population is relatively young, with the median age being 34 and 33 years old of Erskineville and Alexandria respectively. In Erskineville, the industry of employment in the area is mainly comprised of higher education, banking, hospitals and computer system design and related services. In Alexandria, the main industries of employment include banking, computer system design and related services,

higher education and cafes and restaurants. In Erskineville, approximately 57% of dwellings have one registered vehicle and in Alexandria approximately 56% of dwellings have one registered vehicle.

In Erskineville, the most common method of travelling to work was via train (38%) with 5% travelling to work via bicycle. The most common method of travelling to work in Alexandria was by car, as driver (29%) followed closely by train (27%).

The 2019 Population projections indicate that the population of the Sydney LGA is estimated to increase to 287,100 people by 2041. Natural increase is estimated to drive future population growth in the Sydney LGA. People would also continue to move into the City, especially students and young workers (NSW Department of Planning Industry and Environment, 2019).

Demographics

According to the 2016 Census, the suburb of Sydney features the following demographic characteristics:

- Median age of 32
- Children aged 0 - 14 years make up 6.8% and people aged 65 years and over make up 11.5% of the population. The highest age group was persons aged 25-29 years, representing 17.7% of the population
- The suburb is culturally diverse with high proportions of people born overseas. About 47.5% of residents spoke only English at home compared to 41.1% speaking a language other than English
- The suburb contains a higher proportion of family households (45.9%) compared to single person households and group households (38% and 16.2% respectively)
- The majority of the population owns a motor vehicle. People who do not own a motor vehicle make up 38%.

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 range of community services and facilities catering for local residents, workers and visitors. This includes education, transport, health and medical, parks and gardens and community support services and facilities.

Key social infrastructure located near the Project includes:

- Public transport facilities, including (but not limited to) bus stops on Mitchell Road and McEvoy Street
- Open space and parks, including (but not limited to):
    - Erskineville Oval
    - Bowden Playground
    - Sydney Park
- Educational facilities, including (but not limited to) Erskineville Public School and Alexandria Park Community School.

To meet the needs of its 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*).

6.6.2 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:

- Hoardings
- Temporary fencing around protected trees
- Removed sections of the road
- Stationing of operating machinery plant and equipment.

Impacts to air quality during construction would impact the community temporarily. These impacts 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. Construction noise is likely to affect nearby residential and other sensitive receivers as described in **Section 6.2**. Visual impacts during construction are considered to be minor adverse. As such, the overall impact of air quality, noise and visual effects is likely to be minimal and temporary for the community.

As the Project is located in an urbanised inner-city suburb environment, the majority of sensitive receivers nearby the Project reside within apartment type buildings. Notwithstanding, other receivers, namely pedestrians and people on bikes, would also experience those impacts. The extent of those impacts have been outlined within this REF, and mitigation measures listed 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 on 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
- The partial and temporary closure of parking spaces adjacent to Project area footpaths.

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

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

6.6.3 Potential operation impacts

The Project would form part of an expanding cycling network within the 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 Project would result in the permanent removal of existing kerbside usages, including on-street parking that is currently used by residents, shoppers and businesses. The Project would however, provide benefits for pedestrians, with enhanced and upgraded footpaths and street furniture throughout the Project area.

The introduction of the new cycleways on Ashmore and Harley Streets, and potential for mode-shift of local transport, would lead to a greater level of ‘activation’ for the precinct, with more people visibly present within the streetscape at any one time. This would improve the social accessibility of the streetscape and has the potential to foster increased levels of social cohesion. There is also the potential for flow-on effects for local business reliant on passing trade, such as cafes and other retail shops.

The project would not be expected to result in any discernible changes in local demographics, though as noted above, the potential increase in activation of the area may bring with it greater social cohesion across various age, race, gender and economic cohorts.

Overall, noting the potential positive outcomes discussed above, alongside some potential adverse impacts such as the loss of parking, the impact of the Project upon the socio-economic environment of the local area is expected to be negligible.

6.6.4 Mitigation measures

A number of environmental safeguards have been identified 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 this REF.
- Establishment of sustainability criteria for the Project to encourage construction personnel to purchase goods and services locally to support the local community.
- Development of a Community Liaison Management Plan (by the Construction Contractor prior to construction) which would identify potential stakeholders and the best-practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible.
- Feedback through the submissions process to facilitate opportunities for the community and stakeholders to have input into the Project, where practicable.
- Informing the community of construction progress, activities and impacts in accordance with the Community Liaison Management Plan.
- Further consultation with local businesses and residents would be undertaken. Specific issues relating to parking and loading zones would be addressed with individuals that are most affected.

Refer to **Chapter 7.0** for a full list of identified mitigation measures. These mitigation measures would be incorporated into the CEMP.

6.7 Contamination, landform, geology and soils

6.7.1 Existing environment

Landform, geology and soils

Reference to the 1:100,000 Geological Map of Sydney identified that the underlying geology of the Project area is mainly underlain by medium to fine-grained “Marine” sand with Podzols at its eastern extent and silty to peaty quartz sand, silt and clay at its western extent.

The topography of the Project area is relatively flat with slight variations. The Project area has an Australian Height Datum (AHD) elevation of 13 - 15 metres.

The soil landscape of the Project area is located within the boundaries of the Tuggerah landscape (eSPADE, 2020), which typically has 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 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 intergrades 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 Project 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 and adjoining areas.

Acid sulfate soils

Acid sulfate soil (ASS) risk maps have been obtained from the Sydney LEP. Based on the ASS map, the Project area is located on land mapped as containing Class 5 ASS.

Contamination

Given the urbanised nature of the Project area in this location, there is potential for contaminants to be present within the underlying soils. 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.

6.7.2 Potential construction impacts

Soil disturbance, erosion and sedimentation

The Project would involve excavation and other earthworks associated with the proposed cycleway. If not adequately managed, these works could result in the following.

- 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 during work situated on, or adjacent to, downward sloping surfaces. These risks have implications for 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.

Without mitigation measures in place, and in inclement weather conditions involving rain and/or high-velocity wind, the impact of these risks is considered to be a temporary, moderate negative impact. However, the implementation of the mitigation measures identified in **Section 6.7.4** would avoid, manage or mitigate those potential impacts.

Acid Sulfate Soils

The Project area has been mapped as containing Class 5 ASS, meaning that the presence of ASS is unlikely, however, it is located within 500 metres of land mapped as Class 1 to 4 ASS. Given the classification of Class 5 ASS, the potential for exposure within the Project area is low.

In the unlikely event that ASS is uncovered during excavation activities at the Project area, the potential impact would be managed through the implementation of an acid sulfate soil management plan (ASSMP) as identified in **Section 6.7.4**. Overall, it is considered that the potential impact of ASS as a result of construction works within the Project area is considered to be negligible.

Contamination

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

Potential contamination impacts may also arise from the use of fuels, lubricants and chemicals for construction plant and equipment for the Project. Fuels, lubricants and chemicals have the potential to be spilled during construction and may transfer off-site 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 6.7.4**. Further, the extent of potential contamination is unlikely to be significant enough to preclude the Project from going ahead as there would be no change to the existing land use post-development. Overall, the potential impact resulting from contamination within the Project area is considered to be low.

6.7.3 Potential operation impacts

During the operational phase of the Project, general (non-periodic) maintenance is likely to be required to ensure the continued, efficient operation of the cycleway 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 6.7.4** and by following the appropriate protocols for those maintenance works.

6.7.4 Mitigation measures

The following mitigation measures have been identified for application to the Project:

- Prior to commencement of works, an Erosion and Sediment Control Plan would be prepared for the construction works, 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.
- Erosion and sediment control measures would be established prior to site establishment activities and commencement of works 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 off-site, 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.
- An appropriate Unexpected Finds Protocol for potential contaminants, would be included in the CEMP. Procedures are to be addressed 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 or absence of contamination. Contaminated spoil would be disposed of at an appropriately licensed facility.
- Prior to disposal, all spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste* (EPA, 2014).
- Hydrocarbons and chemicals such as fuels, lubricants and oils that may be stored on-site are to be secured 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 of the incident and the Contractor would immediately notify the City of Sydney Project 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.

6.8 Air quality

6.8.1 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).

The Project area would generally follow those trends, however it is located within a highly urbanised locale in the Sydney region and experiences high volumes of vehicle traffic (along with the rest of

Sydney). Transport remains a major source of air pollution in the Sydney region, being the largest source of oxides of nitrogen and carbon monoxide emissions and contributing significantly to total emissions of volatile organic compounds and fine particles (Office of Environment and Heritage, 2018). Given the Project area is located within a dense urban environment that experiences large volumes of traffic, it is reasonable to deduce that the air quality within the Project area may not be as good as other areas of Sydney that do not experience similar levels of traffic.

A search of the National Pollutant Inventory (NPI) database was undertaken on 28 May 2021. Searches were conducted within one kilometre of the Project area. One facility was identified to be located about one kilometre south east of the Project area. This facility is 'Monroe Springs Alexandria' which is a manufacturer of spring and wire products

Potentially affected receivers within the vicinity of the Project area include local residents, businesses and recreational facilities surrounding the site.

6.8.2 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 to and from trucks
- Other general construction activities.

The air quality impact associated with the above activities would be localised and generally contained within the Project 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 Project is expected to be minor and temporary.

6.8.3 Potential operation impacts

The Project has the potential to encourage a mode shift towards active transport from the use of private vehicles, aiding a reduction in air emissions in the long-term. The Project would also reduce the capacity of kerbside parking, potentially resulting in improved air quality for pedestrians on Ashmore Street and Harley Street. By reducing the number of vehicles travelling along Ashmore Street and Harley Street the Project may result in a minor positive impact on local air quality.

6.8.4 Mitigation

The following mitigation measures have been identified for application to the Project:

- 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.

6.9 Biodiversity

6.9.1 Existing environment

Landscape context

The Project is located within the suburbs of Erskineville and Alexandria which are both inner-city suburbs south west of Sydney's CBD. The area is heavily urbanised and vegetation consists of landscaped areas (vegetated medians, parks and residential gardens) and street trees.

Ashmore Street and Harley Street are tree-lined on both the northern and southern sides of the road. Ashmore Street also serves as an entrance to Erskineville Oval and Harley Street serves as an entrance to Bowden Playground. Grass cover and landscaping vegetation (bushes) are located intermittently along both roads.

Database searches

Database searches do not provide the exact species that are located within or around the Project 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 28 May 2021 found records of 61 threatened flora and fauna species listed under the BC Act within a ten square kilometre area around the Project area. According to the BioNet Atlas Map, the following individual species have been recorded in the area:

- *Pteropus poliocephalus* (Grey-headed flying-fox) 1 Metters Street, Erskineville, NSW, 2043 (250 south west of the Project area)
- *Ninox strenua* (Powerful Owl) 116 Swanson Street, Erskineville, NSW, 2043) (270 metres north of the Project area)
- *Pteropus poliocephalus* (Grey-headed flying-fox) within Sheas Creek (south of 17 Maddox Street, Alexandria, NSW, 2015) (360 metres south of the Project area).

A further search was undertaking using the EPBC Act Protected Matters Search Tool (28 May 2021). The search was undertaken for the Project area and a one kilometre buffer around the Project area. The search identified the following:

- Six listed threatened ecological communities:
  - Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin – community may occur within the area
  - Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community – community may occur within the area
  - Coastal Upland Swamps in the Sydney Basin Bioregion – community may occur within the area
  - Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion – community may occur within the area
  - River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria – community may occur within the area
  - Western Sydney Dry Rainforest and Moist Woodland on Shale – community may occur within the area.

- 37 listed threatened species
- 17 listed migratory species
- 3 parcels of Commonwealth land
- 22 listed marine species
- 48 invasive species.

Both search results are presented in

Appendix F.

Flora

The Project area comprises sealed or paved surfaces and currently features about 34 trees along Ashmore Street and Harley Street. City of Sydney's Significant Tree Register does not list significant trees as occurring within the Project area. Garden beds are located on the northern verge of Ashmore Street.

Fauna

Targeted surveys for threatened or migratory fauna were not conducted. The Project 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 very low.

Despite this, certain threatened fauna that are adapted to urban environments may still occasionally use this area, such as Grey-headed Flying-Fox, the Powerful Owl or threatened microbats, particularly due to the presence of street trees or crevices in buildings. The likelihood of those species occurring is low, though without field confirmation, cannot be completely excluded. The main presence of fauna within the Project area is likely to consist of invasive species such as rodents and cats.

6.9.2 Potential construction impacts

Flora

No trees would require removal for the Project. Tree protection devices including fencing and trunk protection in the form of a hessian wrap and timber batters would be installed at all trees that have been identified as being close to the proposed works and at potential risk of damage. Specific management measures to manage impacts to local ecology including potential impacts to tree roots are identified in **Section 0**.

Roadside plants within garden beds are also likely to be disturbed for the adjustment of the existing kerbs along Ashmore Street and Harley Street. These plants were likely planted for landscaping purposes and would be reinstated if disturbed.

Fauna

There would be a small degree of direct disturbance to potential fauna habitat during the construction phase due to the occupation of sites nearby trees and other habitats, as well as disturbance resulting from construction noise and lighting. Where the works are within close proximity to trees, tree protection is to be established.

6.9.3 Potential operation impacts

Given no trees are to be removed for the Project, the potential for further operational impacts to biodiversity as a result of the Project is considered to be limited.

Soft landscaping would be established at the intersection of Ashmore Street and Fox Avenue, Harley Street and Mitchell Road and throughout the Project area. Mitigation measures

A number of mitigation measures have been identified to minimise the biodiversity impact of the Project 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 Project. Trees in the Project 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).
    - During trenching or excavation works, the use of mechanical equipment must stop if tree roots greater than 50mm diameter are encountered. Approval must be sought from the City

of Sydney street tree coordinator to cut roots greater than 50mm diameter. Excavation would be done by hand, or other approved non-destructive methods in areas known to, or suspected of, having roots larger than 50mm diameter.

- Protective fencing should be erected before machinery or materials are brought onto the site and before commencement of works. Once erected, the protective fencing should not be removed or altered without approval from the City of Sydney Street Tree Coordinator.
- Each tree trunk and major branches within the work area are to be wrapped with hessian or similar material to limit damage, then planks spaced at 100mm intervals, and fixed against the trunk with tie wire, or strapping. The trunk protection shall not be fixed to the tree, for example, no nails or screw are to be used.
- Existing sections of kerbing adjacent to street trees shall not be removed without the approval from the City of Sydney Street Tree Coordinator as removal of kerbs adjacent to mature trees can cause trees to become unstable and fail.
- In the event of a 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.

- Should the detailed design or onsite works determine the need to remove or trim trees which have not been identified in the REF, the Construction Contractor is required to complete a City of Sydney Tree Removal Application Form and submit it to the City of Sydney for approval.

6.10 Hydrology and water quality

6.10.1 Existing environment

The nearest watercourse to the Project area is the Sheas Creek located approximately 250 metres south east of Harley Street. The Creek flows into Alexandra Canal around 700 metres south of its closest point to the Project area. Alexandra Canal intersects with the Cooks River and is part of the Cooks River catchment, which begins in Yagoona and flows through to inner south west of Sydney and then Botany Bay. The Project is also located about 950 metres north of Wirrambi Wetland, which is located within Sydney Park.

The Project is located 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. Sheas Creek, Alexandra Canal and the Cooks River are in a degraded condition. Historically the Cooks River catchment was stripped of natural vegetation and sewage, industrial and domestic waste were dumped in the catchment, together with stormwater pollution and rubbish. Industrial pollution is no longer allowed but sewage 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, with stormwater from the urban catchment generally not treated (except for gross pollutants in some locations). Common urban stormwater pollutants are likely to exist.

6.10.2 Potential construction Impacts

The Project would have a minor effect on an already modified landform, with changes limited to the road verge. The construction phase of the Project 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 that have the potential to cause a spill in a safe manner. Potential impacts on surface water quality during construction of the Project would be similar to those experienced for other urban construction projects and are considered manageable with the application of appropriate mitigation measures.

The Project area is located in the Alexandria Canal flood planning area. Temporary disruption to local drainage lines may result in localised construction flooding in parts of the Project area, and drainage impacts could potentially arise as a result of:

- Drainage infrastructure becoming blocked (e.g. by soil, vegetation, waste) or temporarily diverted due to construction activities
- Removal of existing pavement diverting 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 frequency and regime. It is proposed that the contractor would ensure that all existing drainage would remain operational until the new drainage for the Project has been constructed.

6.10.3 Potential operation impacts

The operation of the new cycleway would not result in exposure of soil or increase in impervious surfaces in the Sydney city centre. The design of the cycleway would not alter the overall existing drainage function. Therefore, no impacts to hydrology, water quality or drainage are anticipated during operation of the cycleway.

6.10.4 Mitigation measures

The following mitigation measures have been identified to avoid, minimise or mitigate 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 commencing.
- Disturbed surfaces would be compacted and stabilised in anticipation of a rain event to reduce the potential for erosion.
- 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 kits and trained in their use.

6.11 Climate change and greenhouse gas emissions

6.11.1 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. The effects of climate change on the Sydney Metropolitan region can be assessed in terms of weather changes, storm and rainfall intensities, flooding, and increased risk of fire.

Sydney may be affected in the 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 drought conditions.

Climate change could lead to an increase in average temperatures as well as additional extreme heat days over 40°C and increased heatwaves (three consecutive days over 40°C). Physical impacts associated with extreme heat can include compromising the structural integrity of road and access path surfaces, causing heat stress in users of the cycleway 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 expected to result in increased average rainfall, increased 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 in conjunction 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.

The Project area may also be subject to what is known as the “heat island effect”. This occurs in metropolitan areas which have a significantly warmer climate than the surrounding rural area. The heat island effect is primarily due to human activities such as urban development replacing vegetation with hardstand areas. Concrete and asphalt are the main contributors to the heat island effect. The Project would not result in increasing the area of impervious surfaces as all the cycleway infrastructure utilises existing pavements and road networks, therefore would not be likely to increase the heat island effect.

6.11.2 Greenhouse gas emissions

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

Due to the small scale of the Project and the short-term, temporary nature of the individual construction activities, it is considered that greenhouse gas emissions resulting from the construction of the Project would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of standard mitigation measures listed in **Chapter 7.0**. It is anticipated that, once operational, the Project may result in an increase in use of active transport and a relative decrease in use of private motor vehicles by commuters travelling around the city. This modal shift in transport usage could result in a reduction in fuel consumption by private vehicles and therefore a corresponding relative reduction in associated greenhouse gas emissions in the local area.

6.12 Waste

6.12.1 Existing environment

The waste regulatory framework is administered under the POEO Act and the WARR Act as outlined in **Table 4-1**. The purpose of these pieces of legislation is 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 (i.e. avoiding the use of inefficient plant and construction equipment and avoiding materials with excess embodied energy, waste and 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 Project.

6.12.2 Assessment - Construction

Waste generating activities

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

- Demolition of existing road infrastructure including kerbing, verges, medians, parking spaces, loading zones, taxi zones, footpaths and roadways
- Relocation and/or installation of utilities and services
- Removal and replacement of stormwater drainage pipelines and associated kerb and gutter adjustments
- Vegetation removal.

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 cycleway 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 small volume of excess spoil generated by earthworks, as 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 workforce.

In relation to the Project, 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.

6.12.3 Assessment - Operation

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

6.12.4 Mitigation measures

The following mitigation measures have been identified to minimise the potential impacts associated with waste generation:

- 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 Project.
  - 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 relevant resource recovery exemptions.
  - procedures for storage, transport and disposal of wastes.
  - 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.
- A 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.
- Waste disposed off-site 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.
- Contractors would recycle waste in accordance with the City of Sydney's *Leave nothing to waste: Waste strategy and action plan 2017-2030*.

6.13 Cumulative impacts

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

6.13.1 Concurrent projects

WestConnex – M4-M5 Link

The southern section of the WestConnex M4-M5 link underground tunnel travels through the suburbs of Erskineville and Alexandria, in proximity to the Project. Construction of WestConnex M4-M5 Link is currently underway, and the tunnel is expected to be operational by 2022.

Improvements to the local road network surrounding the tunnel would also be undertaken.

Concurrent CoS projects

Additional cycleway Projects are being undertaken in the surrounding suburbs, including:

- Bridge Street, Railway Parade and Henderson Road Cycleways in Erskineville, 500 metres north west of the Project
- Swanson Street and Mitchell Road shared path Cycleways in Erskineville and Alexandria, 350 metres north east of the Project

6.13.2 Potential construction impacts

Construction

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 works, 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, City of Sydney would work with other developers as part of a construction liaison group. This group would coordinate construction activities, as necessary, to minimise cumulative impacts on the local area, especially to existing businesses affected by the Project.

6.13.3 Potential operation impacts

The Project would facilitate the integrated movement of people on bikes as identified in City of Sydney's '*Cycling strategy and action plan*'. The Project 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 have been identified to minimise potential cumulative impacts:

- CoS cycleways program coordinator to consider cumulative effects of projects' construction works
- 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 other projects are constructed at the same time as the Project
- 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 Project would be managed through environmental management plans and specific safeguards, to reduce 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 Project. The CEMP provides a mechanism through which potential environmental impacts relevant to the Project would be controlled, and outlines a framework of procedures and controls for managing environmental impacts during construction.

The CEMP would also incorporate a number of sub-plans, each of which would address a particular environmental matter e.g. construction noise and vibration, erosion and sediment control, acid sulphate soils and waste.

7.2 Safeguards and mitigation measures

Environmental safeguards and mitigation measures that have been identified for the Project are outlined in the table below. These safeguards would minimise potential adverse impacts of the Project, as discussed in **Section 6.0**.

Table 7-1 Environmental safeguards and mitigation measures

No.	Impact	Environmental safeguards	Timing
TT1	Traffic management	A TMP will be prepared and implemented as part of the CEMP. The TMP would include: • Confirmation of haulage routes • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads. • A response plan for any construction traffic incident. Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic monitoring, review and amendment mechanisms	Pre-Construction and Construction
TT2	Traffic management	During construction, appropriate traffic management measures will be implemented and maintained such as temporary speed restrictions, precautionary signs, illuminated warning devices, manual and/or electronic traffic controls.	Construction

No.	Impact	Environmental safeguards	Timing
TT3	Access	During construction, arrangements will be made to ensure access to businesses and other commercial or residential premises adjacent to construction areas will be maintained where possible.	Construction
TT4	Notification regarding access	During construction, affected businesses and the occupants of other commercial and residential premises will be notified in relation to temporary access restrictions or limitations.	Construction
TT5	Consultation regarding parking	Business owners and residents will be informed of changes in kerbside use, including the permanent loss of, or change in, existing loading and on-street parking spaces.	Pre-Construction and Construction
TT6	Cyclist communication strategy	A cyclist communication strategy will be implemented that will include establishing information signs and maps to inform cyclists of changes to cycleways within the city centre.	Pre-Construction
NV1	Notification to affected receivers	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, operational noise benefits from the works (where applicable) and contact telephone number. Notification will be sent a minimum of 7 calendar days prior to the start of works	Construction
NV2	Construction noise and vibration management plan	Prepare a construction noise and vibration management plan (CNVMP). The CNVMP will be a sub-plan of the CEMP and as a minimum it will include: • A map of the sensitive receiver locations including residential properties. • A work program developed to manage night noise impacts. • Safeguards and management measures to manage out of hours working. • An assessment to determine potential risk for activities likely to affect receivers, including for activities undertaken during and outside of standard working hours. • A process for assessing the performance of the implemented safeguards and management measures.	Pre-Construction
NV3	Noise management and work hours	Work is to be restricted to standard working hours and where possible, noisy work should be undertaken during less sensitive periods	Construction
NV4	Notification to affected receivers	Affected receivers will be notified ahead of time of the likely activities, noise impacts and duration of this work	Pre-Construction
NV5	Notification to nearby receivers	Nearby receivers will be notified of work in advance of the start of construction. This is essential for residential receivers potentially affected by night-time work	Pre-Construction

No.	Impact	Environmental safeguards	Timing
NV6	Noise complaints management	A community complaints phone number will be established and advertised prior to works commencing and be available during work periods. The community complaints line will be established for complaints or queries regarding construction.	Pre-Construction
NV7	Noisy plant	Plant will be turned off when not in use	Construction
NV8	Work site arrangements	The work site will be arranged to minimise the use of movement alarms on vehicles and mobile plant	Construction
NV9	Reverse beepers	Where safety concerns can be adequately managed, the use of squawker, broadband or visual reversing alarms will be considered, rather than traditional beeper styles.	Construction
NV10	Night-time noise during night-time hours	The use of equipment or methods that generate impulsive noise, particularly during night-time hours will be avoided. These include dropping materials from a height, loading/unloading of trucks and metal on metal contact.	Construction
NV11	Construction program	Make the construction program available to the community and ensure it is routinely updated as works progress.	Pre-Construction and 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
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 will 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 will be re-established as soon as practical.	Construction
LV5	Waste materials	Waste materials must be removed from site regularly.	Construction
LV6	Trachyte and bluestone kerbs	Removed kerbs will be replaced with the same material where possible. If that material is not available, the kerb will be replaced with a stone material consistent with streetscapes around the City of Sydney in accordance with the *Sydney Streets Code* (City of Sydney, 2013).	Construction
LV7	Design of new elements	Design of new elements will be carried out in accordance with *Sydney Streets Code* (City of Sydney, 2013) as applicable.	Design
NIH1	Damage to heritage items	If 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 City of Sydney Project Manager and City of Sydney Environmental Officer who may consult with the relevant heritage specialists. Damage is to be	Construction

No.	Impact	Environmental safeguards	Timing
		made good in accordance with specialist heritage advice.	
NIH2	Damage to heritage items – Protection Zones	In order to prevent inadvertent impacts to significant fabric during construction of the proposed development, Protection Zones will be required in all areas where construction works abut a heritage item.	Construction
NIH3	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* to ensure archaeological remains or heritage fabric are not inadvertently affected during the proposed works. This will be implemented through a heritage induction carried out prior to works commencing and throughout the works program.	Construction
NIH4	Unanticipated archaeological deposits	In the event that any unanticipated archaeological deposits are identified within the Project area during construction, the unexpected find procedure will be followed and works within the vicinity of the find will cease immediately. The Construction Contractor will immediately notify the City of Sydney Project 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 will be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.	Construction
IH1	Heritage induction	All construction staff will undergo an induction in the recognition of Indigenous cultural heritage material. This training will 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 Indigenous cultural heritage material and sites.	Construction
IH2	Unanticipated Indigenous objects	If unforeseen Indigenous objects are uncovered during construction, the unexpected finds procedure would be followed and works within the vicinity of the find will cease immediately. The Construction Contractor will immediately notify the City of Sydney Project 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
IH3	Human remains uncovered	If human remains are found, work will cease, the site secured and the NSW Police and DPIE notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit will be obtained prior to works recommencing at the location.	Construction
SE1	Socio-economic	Mitigation measures in respect of potential impacts on environmental matters that collectively influence	Construction

No.	Impact	Environmental safeguards	Timing
		amenity (e.g. noise, dust and visual) as listed in this REF.	
SE2	Sustainability criteria	Establishment of sustainability criteria for the Project to encourage construction personnel to purchase goods and services locally to support the local community.	Pre-Construction
SE3	Community Liaison Management Plan	Development of a Community Liaison Management Plan (by the Construction Contractor prior to construction) which will identify potential stakeholders and the best-practice methods for consultation with these groups during construction. The plan will also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible.	Pre-Construction
SE4	Feedback through the submissions process	Feedback through the submissions process to facilitate opportunities for the community and stakeholders to have input into the Project, where practicable.	Pre-Construction
SE5	Community Liaison Management Plan	Informing the community of construction progress, activities and impacts in accordance with the Community Liaison Management Plan.	Pre-Construction and Construction
SE6	Community Liaison Management Plan	Further consultation with local businesses and residents will be undertaken. Specific issues relating to parking and loading zones will be addressed with individuals that are most affected.	Pre-Construction and Construction
CLGS1	Erosion and Sediment Control Plan	Prior to commencement of works, an Erosion and Sediment Control Plan will be prepared for the construction works 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.	Pre-Construction
CLGS2	Erosion and sediment control	Erosion and sediment control measures will be established prior to site establishment activities and commencement of works and will be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. These measures will 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 will be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment will also be refuelled off-site, or in a designated refuelling area.	Construction
CLGS4	Storage of fuels, chemicals and hazardous liquids	All fuels, chemicals and hazardous liquids will be stored within an impervious bunded area in accordance with Australian Standards and EPA Guidelines.	Construction
CLGS5	Unexpected Finds Protocol	An appropriate Unexpected Finds Protocol for potential contaminants, will be included in the CEMP. Procedures are to be addressed for handling	Pre-Construction

No.	Impact	Environmental safeguards	Timing
		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.	and Construction
CLGS7	Testing potential contaminated spoil	All spoil to be removed from site will be tested to confirm the presence or absence of contamination. Contaminated spoil will be disposed of at an appropriately licensed facility.	Construction
CLGS8	Classifying waste and spoil	Prior to disposal, all spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste* (EPA, 2014).	Construction
CLGS9	Dedicated storage facilities for hydrocarbons and chemicals	Hydrocarbons and chemicals such as fuels, lubricants and oils that may be stored on-site are to be secured 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 will cease in the immediate vicinity and the Contractor will immediately notify the City of Sydney Project Manager and the City of Sydney Environmental Officer. The EPA will 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 will be cleaned immediately, and the site Environmental Manager will be notified of the location of the incident, extent of the incident and type of material spilled.	Construction
CLGS13	Acid sulfate soil management plan	An ASSMP will be included in the CEMP. The ASSMP needs to identify the management requirements for ASS discovered within the Project area. This will be determined in consultation with the construction contractor.	Pre-Construction
AQ1	Management of emissions	Methods for management of emissions will be incorporated into project inductions, training and pre-start/toolbox talks.	Pre-Construction and Construction
AQ2	Vehicles and machinery maintenance	Plant and machinery will be regularly checked and maintained in a proper and efficient condition. Plant and machinery will 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 will 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 will be implemented:	Construction

No.	Impact	Environmental safeguards	Timing
		• 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.	
BIO1	Biodiversity induction	All workers are to be provided with an environmental induction prior to commencing work onsite. This induction will 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 Project. Trees in the Project area will be protected through temporary protection measures discussed below. • Tree protection will be undertaken in line with AS 4970-2009 Protection of Trees on Development Sites and will include exclusion fencing of tree protection zones (TPZs). • During trenching or excavation works, the use of mechanical equipment must stop if tree roots greater than 50mm diameter are encountered. Approval must be sought from the City of Sydney street tree coordinator to cut roots greater than 50mm diameter. Excavation will be done by hand, or other approved non-destructive methods in areas known to, or suspected of, having roots larger than 50mm diameter. • Protective fencing should be erected before machinery or materials are brought onto the site and before commencement of works. Once erected, the protective fencing should not be removed or altered without approval from the City of Sydney Street Tree Coordinator. • Each tree trunk and major branches within the work area are to be wrapped with hessian or similar material to limit damage, then planks spaced at 100mm intervals, and fixed against the trunk with tie wire, or strapping. The trunk protection shall not be fixed to the tree, for example, no nails or screw are to be used. • Existing sections of kerbing adjacent to street trees shall not be removed without the approval from the City of Sydney Street Tree Coordinator. Removal of kerbs adjacent to mature trees can cause trees to become unstable and fail. • In the event of a 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	Construction

No.	Impact	Environmental safeguards	Timing
		Environmental Officer to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.	
BIO3	City of Sydney Tree Removal Application Form to remove additional trees	Should the detailed design or onsite works determine the need to remove or trim additional trees, which have not been identified in the REF, the Construction Contractor is required to complete a City of Sydney Tree Removal Application Form and submit it to the City of Sydney for approval.	Pre-Construction
HWQ1	Erosion and Sedimentation Control Plan	Temporary drainage or drainage diversions will be installed so that stormwater function is not impeded during construction.	Pre-Construction
HWQ2	Erosion and Sedimentation Control Plan	An Erosion and Sedimentation Control Plan (ESCP) will be prepared in accordance with the Landcom Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) prior to construction commencing.	Pre-Construction
HWQ3	Disturbed surfaces	Disturbed surfaces will be compacted and stabilised in anticipation of a rain event to reduce the potential for erosion.	Construction
HWQ4	Removal of material deposited	Material deposited onto pavements will be swept and removed at the end of each working shift and prior to rainfall.	Construction
HWQ5	Storage of fuels, oils and other chemicals	Fuels, oils and other chemicals will not be stored in the vicinity of the construction site wherever possible.	Construction
HWQ6	Emergency wet and dry spill kits	Emergency wet and dry spill kits will be kept on site at all times and all staff will be made aware of the location of the spill kits and trained in their use.	Construction
W1	Waste Management Plan	A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to: • measures to avoid and minimise waste associated with the Project. • classification of wastes and management options (re-use, recycle, stockpile, disposal) 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 relevant resource recovery exemptions. • procedures for storage, transport and disposal of wastes. • monitoring, record keeping and reporting. The WMP will be prepared taking into account the WARR Act and *Waste Classification Guidelines* (EPA, 2014).	Pre-Construction
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

No.	Impact	Environmental safeguards	Timing
W3	Waste management	A 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 will be provided onsite. Waste will 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.	Construction
W4	Waste facility licenced under the POEO Act	Waste disposed off-site 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 will be kept free of rubbish, with appropriate receptacles provided for waste management and recycling.	Construction
W6	Waste management	Contractors will recycle waste in accordance with the City of Sydney's *Leave nothing to waste: Waste strategy and action plan 2017-2030*.	Construction
CU1	Cumulative impacts	CoS cycleways program coordinator to consider cumulative effects of projects' construction works. There is potential to block access to Erskineville Oval via Fox Avenue with this Project and another Project on Ashmore Street.	Pre-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 other projects are constructed at the same time as the Project.	Pre-Construction
CU3	Cumulative impacts – CEMP	The CEMP will be revised to consider potential cumulative impacts from surrounding development activities as they become known. This will include a process to review and update mitigation measures as new works begin or if complaints are received.	Pre-Construction

8.0 Conclusion and certification

8.1 Conclusion

This Review of Environmental Factors has been prepared to assess the environmental impacts of the proposed Ashmore cycleway. This cycleway is part of the Cycling Strategy and Action Plan which has been developed by the City of Sydney to improve cycling access throughout the CDB and City of Sydney LGA. The Project would generate benefits including:

- Improved journey time reliability for people on bikes
- 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.

The 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 Project complies with relevant State and local planning, strategy and policies, 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 ten percent of all trips in the LGA to be made by bike. City of Sydney has since planned and largely implemented the delivery of the first suite of cycle network projects and updated the Strategy and Action Plan in 2018.

The assessment undertaken in this Review of Environmental Factors has confirmed that the Project would not result in a significant impact on declared critical habitat, threatened species, populations or ecological communities or their habitats. A Species Impact Statement is therefore not required, nor is a referral under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. The assessment demonstrated that the Project 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 Transport for NSW.

The public exhibition of this Review of Environmental Factors would provide an opportunity for the community, businesses and landowners to comment on the Project.

The Review of Environmental Factors 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** have also been identified to minimise environmental impacts associated with the implementation of the Project, which includes the preparation of a Construction Environmental Management Plan and sub-plans.

The identified mitigation measures would enable the Project to be constructed and operated without resulting in a 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 Project 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 Project.

Jamie McMahon

Environmental Scientist - Associate Director

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 matters of national environmental significance under the EPBC Act to be considered in order to determine whether the Project should be referred to the Commonwealth Department of the Environment and Energy.

Matters of National Environmental Significance	Impacts
Any impact on a World Heritage property?	**Nil**
Any impact on a National Heritage place?	**Nil**
Any impact on a wetland of international importance?	**Nil**
Any impact on a listed threatened species or communities?	**Nil**
Any impacts on listed migratory species?	**Nil**
Does the Project involve a nuclear action (including uranium mining)?	**Nil**
Any impact on a Commonwealth marine area?	**Nil**
Does the Project involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources?	**Nil**
Additionally, any impact (direct or indirect) on Commonwealth land?	**Nil**

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 Project would have a significant impact on the environment.

Factor	Impacts
(a) Any environmental impact on a community? The Project is located within a modified urban area and would not result in any environmental impact on a community. The Project would involve public domain and additional street tree planting the provide a positive contribution to the environment.	Minor
(b) Any transformation of a locality? The Project would transform Ashmore Street and Harley Street. The change comes through the provision of active transport infrastructure and upgraded pedestrian facilities. The transformation is considered to be positive.	Minor
(c) Any environmental impact on the ecosystem of the locality? The Project is located in a modified urban area with limited natural environmental areas or values. There are no identified threatened species or habitats and no affected heritage items within the proposed Project area.	Minor
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The Project would result in a short-term reduction of the aesthetic of Ashmore Street and Harley Street. The Project area has been modified by previous and current development and lacks distinctive aesthetic, recreational and scientific value or other environmental quality.	Minor
(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 Project would have minor, indirect impacts upon items of heritage significance. In addition, the Project would have a minor positive impact on Ashmore Street and Harley Street for future generations through the provision of needed active transport infrastructure.	Minor
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The Project is located in a modified urban environment that is unlikely to contain habitat of protected fauna.	Minor

Factor	Impacts
(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 Project is located in a modified urban environment that is unlikely to contain habitat of protected fauna. No trees are proposed to be removed for the Project. The provision of soft landscaping could contribute to the potential for additional foraging habitat for species.	Minor
(h) Any long-term effects on the environment? The Project is proposed as a transport solution to improve access in the area and active transport networks. The Project is aimed at encouraging a modal shift of transport to active transport, reducing the volume of vehicles within the City of Sydney, thereby reducing vehicle emissions.	Minor
(i) Any degradation of the quality of the environment? The Project would not degrade the quality of the environment which is heavily urbanised.	Minor
(j) Any risk to the safety of the environment? Construction of the Project poses risks to the safety of the environment, where works are not mitigated. This REF has proposed a number of mitigation measures aimed at avoiding, managing or mitigating potential risks to the environment.	Minor
(k) Any reduction in the range of beneficial uses of the environment? The Project would provide for an increase in sustainable transport use and public domain enhancements would provide increased value to the area. The Project would ensure long term access improvements in the area.	Minor
(l) Any pollution of the environment? The Project would result in a minor increase in air pollution during the construction stage.	Minor
(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 Project would not generate significant waste.	Minor
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Project is unlikely to increase demand on resources (natural or otherwise) that are, or are likely to become, in short supply.	Minor
(o) Any cumulative environmental effect with other existing or likely future activities? Construction of the Project would coincide with the construction of a number of other Projects in the City of	Minor

Factor	Impacts
Sydney. Cumulative impacts as a result of concurrent development would be managed in accordance with measures outlined in Section 6.13.4.	
(p) Any impact on coastal processes and coastal hazards, including those under Proposed climate change conditions? The Project is located approximately 7 km from the coastline and is unlikely to impact on coastal processes.	Minor

Appendix C

Design Drawings

Appendix D

Noise Calculator Tool

Appendix E

AHIMS Search

Appendix F

BioNet Atlas and Protected Matters Search Tool

Appendix G

Engagement Report