

Appendix U

Socio-economic assessment

Roads and Maritime Services

Western Harbour Tunnel and Warringah Freeway Upgrade

Technical working paper: Socio-economic assessment

January 2020

Prepared for

Roads and Maritime

Prepared by

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Glossary and acronyms

| Term | Definition |
|--------------------|---|
| ABS | Australian Bureau of Statistics |
| CBD | Central business district |
| EP&A Act | NSW Environmental Planning and Assessment Act 1979 |
| EPBC Act | Environment Protection and Biodiversity Conservation Act 1999 |
| ERP | Estimated Resident Population |
| ISKCON | International Society for Krishna Consciousness |
| LGA | Local government area |
| NSW | New South Wales |
| PCYC | Police Citizens Youth Club |
| Roads and Maritime | Roads and Maritime Services |
| SA1 | Statistical Area Level 1 |
| SA2 | Statistical Area Level 2 |
| SEARs | Secretary's Environmental Assessment Requirements |
| SEIFA | Socio-Economic Indexes for Areas |
| Transport for NSW | Transport for New South Wales |

Executive summary

The Western Harbour Tunnel and Beaches Link program of works is a NSW Government initiative to provide additional road network capacity across Sydney Harbour and to improve connectivity with Sydney's Northern Beaches. The Western Harbour Tunnel and Beaches Link program of works includes:

- The Western Harbour Tunnel and Warringah Freeway Upgrade project which comprises a new tolled motorway tunnel connection across Sydney Harbour, and an upgrade of the Warringah Freeway to integrate the new motorway infrastructure with the existing road network and to connect to the Beaches Link and Gore Hill Freeway Connection project
- The Beaches Link and Gore Hill Freeway Connection project which comprises a new tolled motorway tunnel connection across Middle Harbour from the Warringah Freeway and Gore Hill Freeway to Balgowlah and Killarney Heights and including the surface upgrade of Wakehurst Parkway from Seaforth to Frenchs Forest and upgrade and integration works to connect to the Gore Hill Freeway at Artarmon.

Together, the Western Harbour Tunnel and Beaches Link program of works would form a new integrated north-south motorway connection that would reduce congestion, improve journey times, support rapid movement of people and freight, and enhance the resilience of the road network across Sydney.

Roads and Maritime Services (Roads and Maritime) is seeking approval under Division 5.2, Part 5 of the *Environmental Planning and Assessment Act 1979* to construct and operate the Western Harbour Tunnel and Warringah Freeway Upgrade project (the project), which would comprise two main components:

- A new crossing of Sydney Harbour involving twin tolled motorway tunnels connecting the M4-M5 Link at Rozelle and the existing Warringah Freeway at North Sydney (the Western Harbour Tunnel)
- Upgrade and integration works along the existing Warringah Freeway, including allowance for connections to the Beaches Link and Gore Hill Freeway Connection project (the Warringah Freeway Upgrade).

Key features of the Western Harbour Tunnel and Warringah Freeway Upgrade project are discussed in Section 1.2. A detailed description of the project is provided in Chapter 5 (Project description) of the environmental impact statement.

This assessment has been prepared to support the environmental impact statement for the project. The environmental impact statement has been prepared to accompany the application for approval of the project and address the environmental assessment requirements of the Secretary of the Department of Planning, Industry and Environment (formerly the Department of Planning and Environment) ('the Secretary's environmental assessment requirements').

Based on the current project design, an estimated 28 properties would be acquired or leased for the project. Land owned by Roads and Maritime would also be used for construction and operation of the project. Twenty properties would be fully acquired for the project, including one commercial property, 16 residential properties, two properties comprising vacant land and one property comprising kerbside land adjacent to Rose Avenue Reserve.

Sixteen residential properties would be permanently acquired for the project and occupants of these properties would need to permanently relocate prior to construction. One residential property would be subject to permanent partial acquisition for the project. Occupants of this property would not be required to permanently relocate. The tunnel alignment would also pass under a large number of properties, including residential, commercial and social infrastructure. Five properties would be partially acquired for the project, including land owned by the NSW Government and privately-owned land. Land affected by partial acquisition comprises one commercial property, one residential property and three properties accommodating social infrastructure.

The project would require the partial acquisition of land at Cammeray Golf Course for the establishment of operation support facilities. The nine-hole golf course would be reconfigured to enable ongoing use of the golf

course during construction and operation. The project may also require partial acquisition of land at St Leonards Park, which would not directly impact on facilities or on the long-term use of the park. Further design development may avoid the need for permanent acquisition of land from St Leonards Park.

Four properties would be temporarily leased during construction for use as construction support sites. This includes land used for industrial and commercial uses at White Bay and land accommodating open space areas such as Yurulbin Park at Birchgrove, St Leonards Park and Cammeray Golf Course at Cammeray. Community access to open space within the construction support sites would be temporarily restricted during construction. Increased construction noise, dust and traffic may also diminish the amenity of these areas, potentially impacting on the use and enjoyment of visitors to non-affected areas of these parks.

Some people near the project may experience a level of stress and anxiety associated with the acquisition of their property, the location of the tunnels beneath their properties, or the proximity of their properties to infrastructure such as operational facilities. This has the potential to impact on the health and wellbeing of some individuals.

The project would require operational facilities at the Rozelle interchange and Cammeray Golf Course. The location of these facilities may impact on visual amenity values for surrounding communities and detract from the recreational values of nearby sporting facilities. Operation of the support facilities may also influence people's perceptions of local air quality at these locations and community concerns about potential health impacts, particularly for sensitive groups such as elderly people and young children. This is likely to be of particular concern for surrounding residents and users of nearby social infrastructure such as sporting facilities, schools and childcare centres. Further detail about the air quality impacts of the project are provided in *Technical working paper: Air quality* (ERM, 2020).

During construction, there is also potential for the project to:

- Provide benefits to employment through the creation of direct construction-related employment on the project
- Increase expenditure on local goods and services, resulting in beneficial impacts for local businesses
- Impact on community values, residential and visual amenity, parks/open space, and Sydney Harbour, through noise, vibration and dust from construction activities, road infrastructure, construction support sites and cofferdams, and vegetation removal
- Result in temporary changes and delays to local access and connectivity due to construction works and additional traffic, including for businesses, bus services, pedestrians and cyclists.

In the long term, the project would improve travel times, enhance the reliability of the road network across Sydney and improve access to the north and north-east of Sydney. The project would also improve access and connectivity to community services and facilities within the study area for local residents, through travel time savings and improved travel time reliability.

Operation of the project may also result in changes to noise from road traffic for some communities near the project. Potential air quality impacts for local communities near tunnel portals and operation support facilities were raised by some community members as a concern during consultation for the project. Overall, the regional impacts of the project on air quality would be negligible and indistinguishable from ambient air quality measurements at background monitoring locations.

Locally, the project would generally result in improved travel times along key routes in the Rozelle area, with traffic using Western Harbour Tunnel in preference to the ANZAC Bridge and Western Distributor. The project would also improve average travel speeds through the Warringah Freeway and North Sydney area, due to a new road based crossing of Sydney Harbour providing an alternate western bypass of the Sydney CBD, reducing the reliance on the existing Sydney Harbour crossings for a range of journeys

Operation of the project may result in changes to traffic noise levels for communities near the tunnel connections and Warringah Freeway. In particular, increased traffic noise may be experienced by some receivers near the Rozelle interchange due to forecast increases in traffic volumes on roads leading to and

from the interchange. Conversely, decreased traffic noise impacts may be experienced by some communities near the Warringah Freeway Upgrade due to the forecast reduction in traffic volumes along existing surface roads. Further detail about the operational noise impacts of the project are provided in the *Technical working paper: Noise and vibration* (Renzo Tonin & Associates, 2020).

The implementation of safeguards and management measures would assist in avoiding or mitigating potential impacts on the socio-economic environment of the study area during construction and operation, while maximising or enhancing project benefits. In particular, engagement with affected property owners, businesses and communities as well as community participation would be ongoing to guide the planning, environmental management and monitoring phases during construction and operation. Safeguards and management measures relevant to socio-economic impacts of the project are identified in Section 7 of this report.

1. Introduction

This section provides an overview of the Western Harbour Tunnel and Warringah Freeway Upgrade (the project), including its key features and location. It also outlines the Secretary's environmental assessment requirements addressed in this technical working paper.

1.1 Overview

The Greater Sydney Commission's *Greater Sydney Region Plan – A Metropolis of Three Cities* (Greater Sydney Commission, 2018) proposes a vision of three cities where most residents have convenient and easy access to jobs, education and health facilities and services. In addition to this plan, and to accommodate for Sydney's future growth the NSW Government is implementing the *Future Transport Strategy 2056* (Transport for NSW, 2018), a plan that sets the 40 year vision, directions and outcomes framework for customer mobility in NSW. The Western Harbour Tunnel and Beaches Link program of works is proposed to provide additional road network capacity across Sydney Harbour and to improve transport connectivity with Sydney's northern beaches. The Western Harbour Tunnel and Beaches Link program of works include:

- The Western Harbour Tunnel and Warringah Freeway Upgrade project which comprises a new tolled motorway tunnel connection across Sydney Harbour, and an upgrade of the Warringah Freeway to integrate the new motorway infrastructure with the existing road network and to connect to the Beaches Link and Gore Hill Freeway Connection project
- The Beaches Link and Gore Hill Freeway Connection project which comprises a new tolled motorway tunnel connection across Middle Harbour from the Warringah Freeway and Gore Hill Freeway to Balgowlah and Killarney Heights and including the surface upgrade of Wakehurst Parkway from Seaforth to Frenchs Forest and upgrade and integration works to connect to the Gore Hill Freeway at Artarmon.

A combined delivery of the Western Harbour Tunnel and Beaches Link program of works would unlock a range of benefits for freight, public transport and private vehicle users. It would support faster travel times for journeys between the Northern Beaches and south, west and north-west of Sydney Harbour. Delivering the program of works would also improve the resilience of the motorway network, given that each project provides an alternative to heavily congested harbour crossings.

1.2 The project

Roads and Maritime Services (Roads and Maritime) is seeking approval under Division 5.2, Part 5 of the *Environmental Planning and Assessment Act 1979* to construct and operate the Western Harbour Tunnel and Warringah Freeway Upgrade, which would comprise two main components:

- A new crossing of Sydney Harbour involving twin tolled motorway tunnels connecting the M4-M5 Link at Rozelle and the existing Warringah Freeway at North Sydney (the Western Harbour Tunnel)
- Upgrade and integration works along the existing Warringah Freeway, including infrastructure required for connections to the Beaches Link and Gore Hill Freeway Connection project (the Warringah Freeway Upgrade).

Key features of the Western Harbour Tunnel component of the project are shown in Figure 1-1 and would include:

- Twin mainline tunnels about 6.5 kilometres long and each accommodating three lanes of traffic in each direction, connecting the stub tunnels from the M4-M5 Link at Rozelle to the Warringah Freeway and to the Beaches Link mainline tunnels at Cammeray. The crossing of Sydney Harbour between Birchgrove and Waverton would involve a dual three lane, immersed tube tunnels
- Connections to the stub tunnels at the M4-M5 Link project in Rozelle and to the mainline tunnels at Cammeray (for a future connection to the Beaches Link and Gore Hill Freeway Connection project)

- Surface connections at Rozelle, North Sydney and Cammeray, including direct connections to and from the Warringah Freeway (including integration with the Warringah Freeway Upgrade), an off ramp to Falcon Street and an on ramp from Berry Street at North Sydney
- A ventilation outlet and motorway facilities (fitout and commissioning only) at the Rozelle Interchange
- A ventilation outlet and motorway facilities at the Warringah Freeway in Cammeray
- Operational facilities including a motorway control centre at Waltham Street, within the Artarmon industrial area and tunnel support facilities at the Warringah Freeway in Cammeray
- Other operational infrastructure including groundwater and tunnel drainage management and treatment systems, signage, tolling infrastructure, fire and life safety systems, lighting, emergency evacuation and emergency smoke extraction infrastructure, CCTV and other traffic management systems.

Key features of the Warringah Freeway Upgrade component of the project are shown in Figure 1-2 and would include:

- Upgrade and reconfiguration of the Warringah Freeway from immediately north of the Sydney Harbour Bridge through to Willoughby Road at Naremburn
- Upgrades to interchanges at Falcon Street in Cammeray and High Street in North Sydney
- New and upgraded pedestrian and cyclist infrastructure
- New, modified and relocated road and shared user bridges across the Warringah Freeway
- Connection of the Warringah Freeway to the portals for the Western Harbour Tunnel mainline tunnels and the Beaches Link tunnels via on and off ramps, which would consist of a combination of trough and cut and cover structures
- Upgrades to existing roads around the Warringah Freeway to integrate the project with the surrounding road network
- Upgrades and modifications to bus infrastructure, including relocation of the existing bus layover along the Warringah Freeway
- Other operational infrastructure, including surface drainage and utility infrastructure, signage, tolling, lighting, CCTV and other traffic management systems.

A detailed description of the project is provided in Chapter 5 (Project description) and construction of the project is described in Chapter 6 (Construction work) of the environmental impact statement. The project alignment at the Rozelle Interchange shown in Figure 1-1 and Figure 1-3 reflects the arrangement presented in the environmental impact statement for the M4-M5 Link, and as amended by the proposed modifications. The project would be constructed in accordance with the now finalised M4-M5 Link detailed design (refer to Section 2.1.1 of Chapter 2 (Assessment process) of the environmental impact statement for further details).

The project does not include ongoing motorway maintenance activities during operation or future use of residual land occupied or affected by project construction activities, but not required for operational infrastructure. These would be subject to separate planning and approval processes at the relevant times.

Subject to the project obtaining planning approval, construction is anticipated to commence in 2020 and is expected to take around six years to complete.

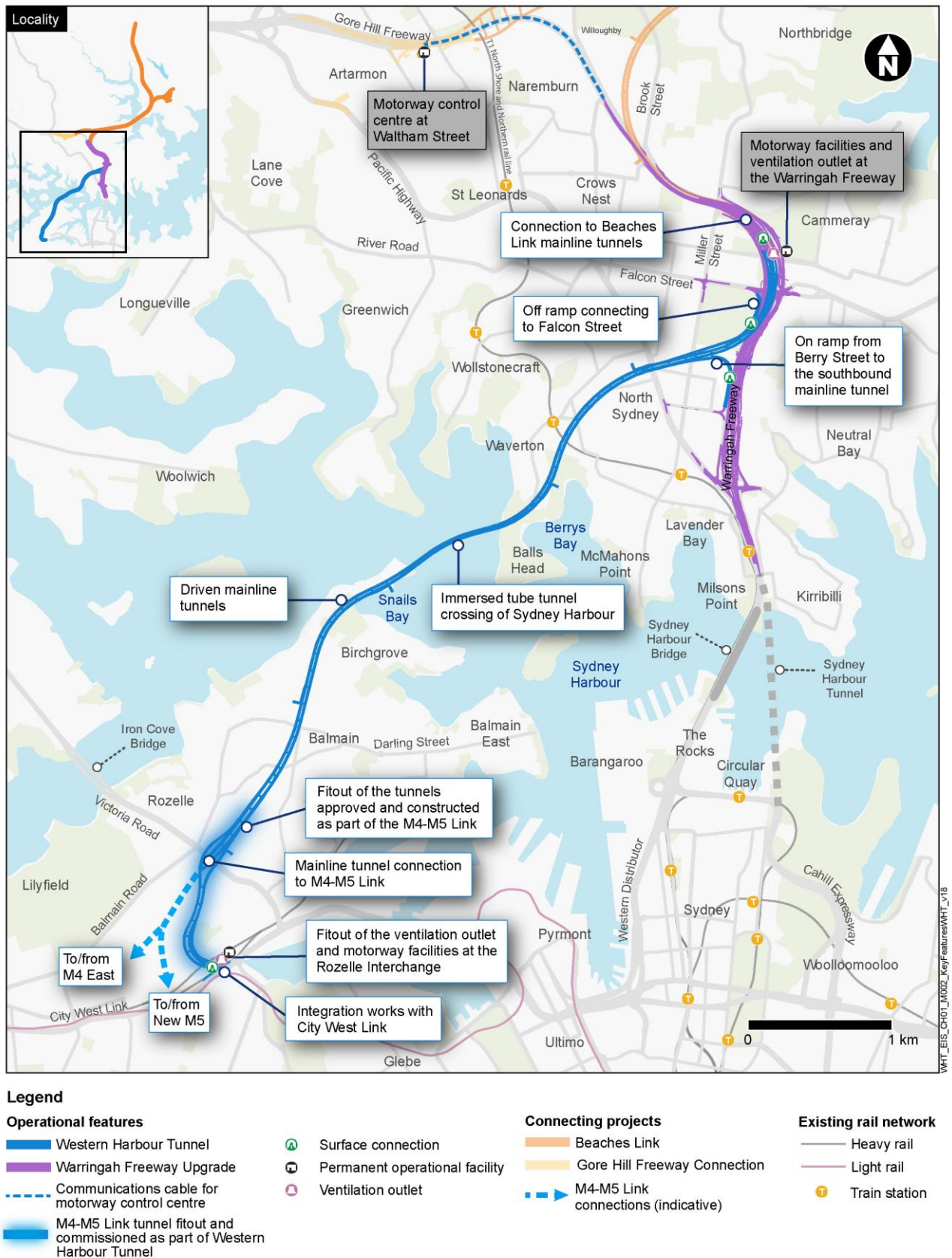


Figure 1-1 Key features of the Western Harbour Tunnel component of the project

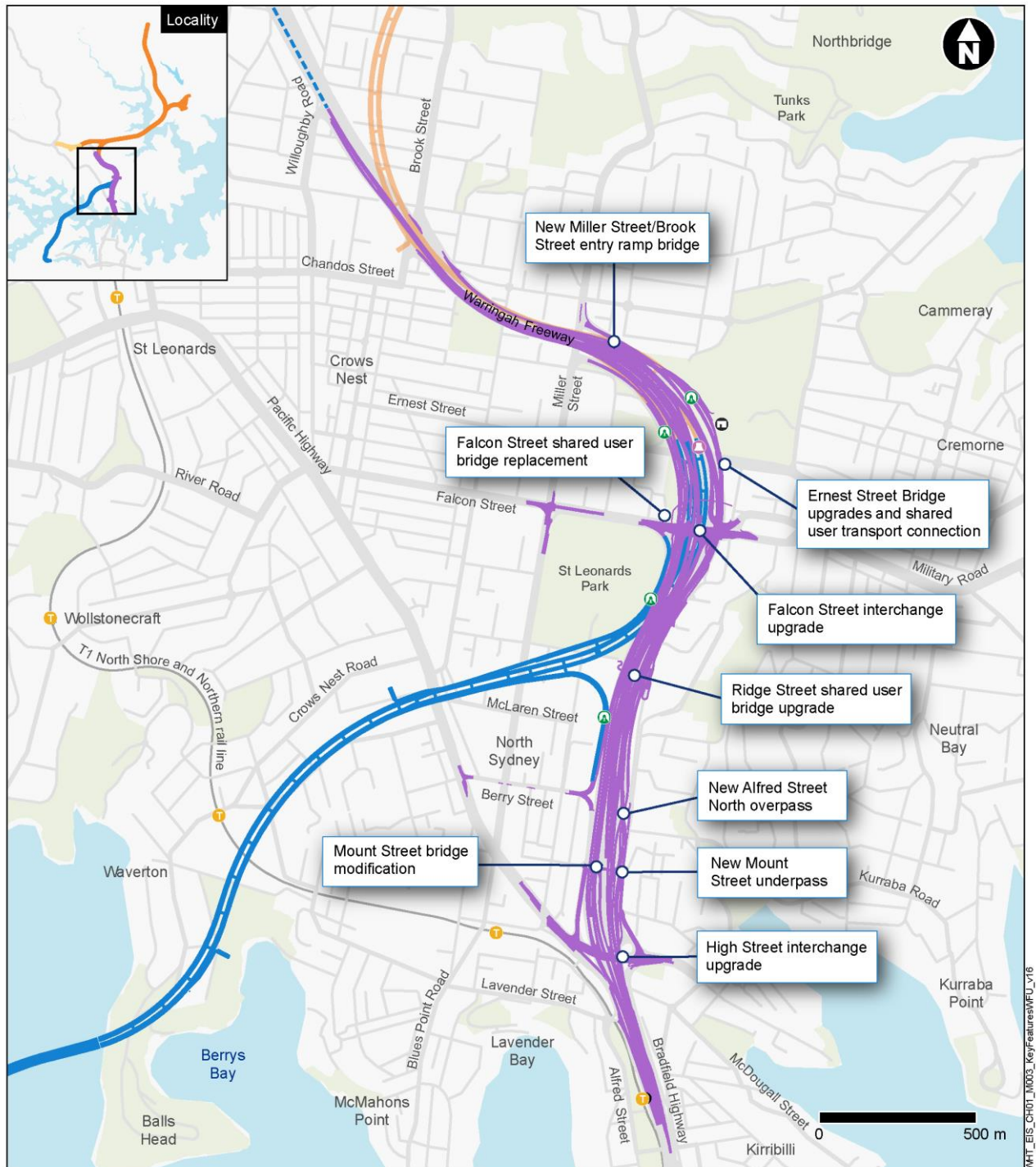


Figure 1-2 Key features of the Warringah Freeway Upgrade component of the project

1.3 Key construction activities

The area required to construct the project is referred to as the construction footprint. The majority of the construction footprint would be located underground within the mainline tunnels. However, surface areas would be required to support tunnelling activities and to construct the tunnel connections, tunnel portals and operational ancillary facilities.

Key construction activities would include:

- Early works and site establishment, with typical activities being property acquisition and condition surveys, utilities installation, protection, adjustments and relocations, installation of site fencing, environmental controls (including noise attenuation and erosion and sediment control) and traffic management controls, vegetation clearing, earthworks and demolition of structures, establishment of construction support sites including acoustic sheds and associated access decline acoustic enclosures (where required), construction of minor access roads and the provision of property access, temporary relocation of pedestrian and cycle paths and bus stops, temporary relocation of swing moorings within Berrys Bay and relocation of the historic vessels
- Construction of Western Harbour Tunnel, with typical activities being excavation of tunnel construction accesses, construction of driven tunnels, cut and cover and trough structures and construction of cofferdams, dredging activities in preparation for the installation of immersed tube tunnels, casting and installation of immersed tube tunnels and civil finishing and tunnel fitout
- Construction of operational facilities comprising of a motorway control centre at Waltham Street in Artarmon, motorway and tunnel support facilities and ventilation outlets at the Warringah Freeway in Cammeray, construction and fitout of the project operational facilities that form part of the M4-M5 Link Rozelle East Motorway Operations Complex, a wastewater treatment plant at Rozelle and the installation of motorway tolling infrastructure
- Construction of the Warringah Freeway Upgrade, with typical activities being earthworks, bridgeworks, construction of retaining walls, stormwater drainage, pavement works and linemarking and the installation of road furniture, lighting, signage and noise barriers
- Testing of plant and equipment, and commissioning of the project, backfill of access declines, removal of construction support sites, landscaping and rehabilitation of disturbed areas and removal of environmental and traffic controls.

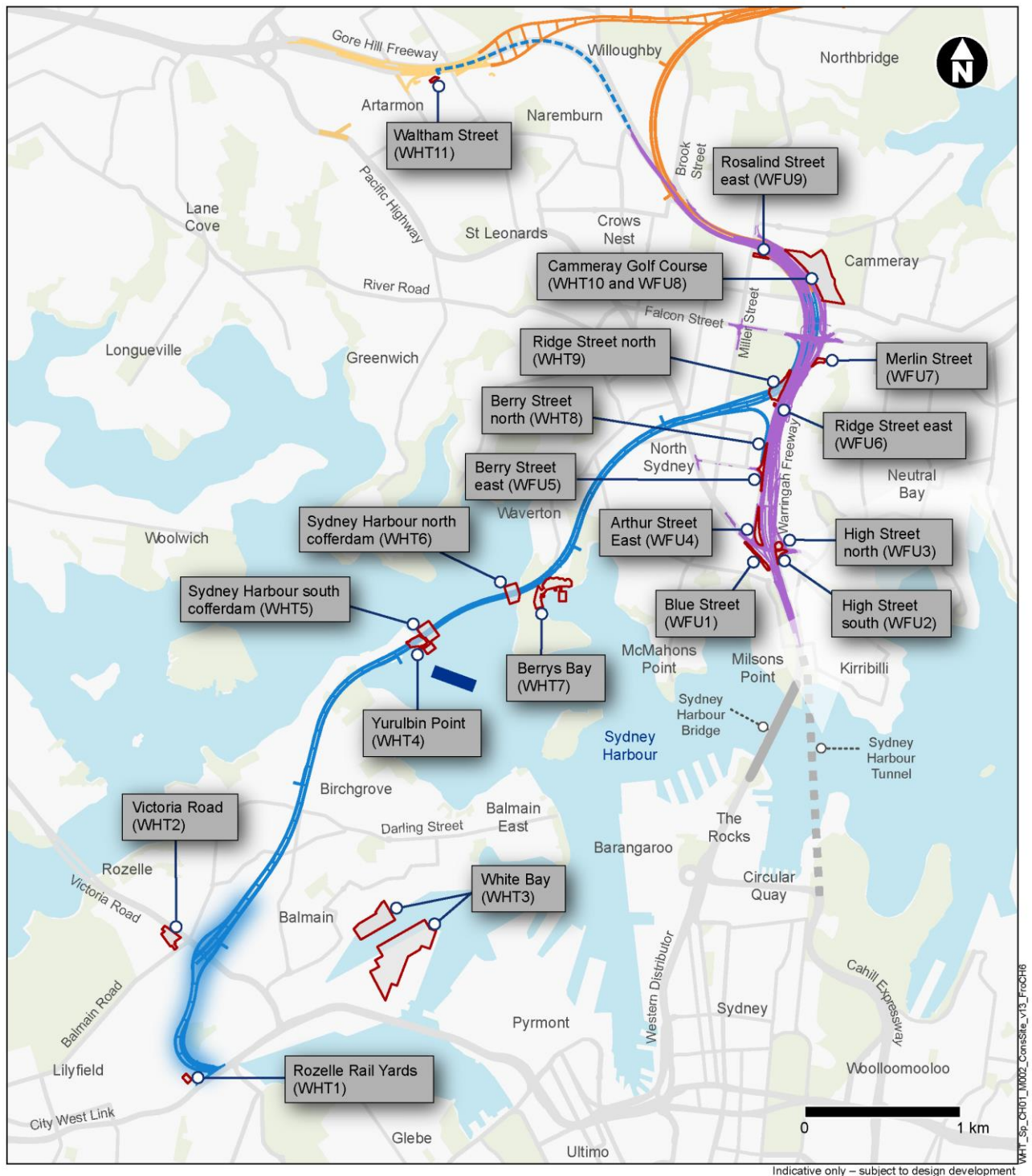
Temporary construction support sites would be required as part of the project (refer to Figure 1-3), and would include tunnelling and tunnel support sites, civil surface sites, cofferdams, mooring sites, wharf and berthing facilities, laydown areas, parking and workforce amenities. Construction support sites for Western Harbour Tunnel would include:

- Rozelle Rail Yards (WHT1)
- Victoria Road (WHT2)
- White Bay (WHT3)
- Yurulbin Point (WHT4)
- Sydney Harbour south cofferdam (WHT5)
- Sydney Harbour north cofferdam (WHT6)
- Berrys Bay (WHT7)
- Berry Street north (WHT8)
- Ridge Street north (WHT9)
- Cammeray Golf Course (WHT10)
- Waltham Street (WHT11).

During the construction of the Warringah Freeway Upgrade, smaller construction support sites would be required to support the construction works (as shown on Figure 1-3). These include:

- Blue Street (WFU1)
- High Street south (WFU2)
- High Street north (WFU3)
- Arthur Street east (WFU4)
- Berry Street east (WFU5)
- Ridge Street east (WFU6)
- Merlin Street (WFU7)
- Cammeray Golf Course (WFU8)
- Rosalind Street east (WFU9).

A detailed description of construction works for the project is provided in Chapter 6 (Construction work) of the environmental impact statement.



Legend

Construction features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Communications cable for motorway control centre
- Fit out and commissioned as part of Western Harbour Tunnel, constructed as part of WestConnex M4-M5 Link

- Construction support sites
- Mooring site

Connecting projects

- Beaches Link
- Gore Hill Freeway Connection

Figure 1-3 Overview of construction support sites

1.4 Project location

The project would be located within the Inner West, North Sydney and Willoughby local government areas, connecting Rozelle in the south with Naremburn in the north.

Commencing at the Rozelle Interchange, the mainline tunnels would pass under Balmain and Birchgrove, then cross Sydney Harbour between Birchgrove and Balls Head. The tunnels would then continue under Waverton and North Sydney, linking directly to the Warringah Freeway to the north of the existing Ernest Street bridge.

The motorway control centre would be located at Waltham Street, Artarmon, with a trenched communications cable connecting the motorway control centre to the Western Harbour tunnel along the Gore Hill Freeway and Warringah Freeway road reserves.

The Warringah Freeway Upgrade would be carried out on the Warringah Freeway from around Fitzroy Street at Milsons Point to around Willoughby Road at Naremburn. Upgrade works would include improvements to bridges across the Warringah Freeway, and upgrades to surrounding roads.

1.5 Purpose of this report

This report has been prepared to support the environmental impact statement for the project and to address the environmental assessment requirements of the Secretary of the Department of Planning, Industry and Environment (formerly Department of Planning and Environment) ('the Secretary's environmental assessment requirements').

This report provides an assessment of potential socio-economic benefits and impacts of the project and includes:

- A description of the existing socio-economic baseline conditions of potentially affected communities and groups near the project
- An assessment of potential changes to socio-economic conditions from the construction and operation of the project
- Recommended mitigation and monitoring measures to enhance the project's benefits and to avoid, manage or mitigate its potential socio-economic impacts.

1.6 Secretary's environmental assessment requirements

The Secretary's environmental assessment requirements relating to socio-economic, land use and property impacts and where these requirements are addressed in this report are outlined in Table 1-1.

Table 1-1 Secretary's environmental assessment requirements – Socio-economic, land use and property

| Secretary's environmental assessment requirement | Where addressed |
|---|---|
| 1. The Proponent must assess social and economic impacts (of all phases of the project) in accordance with the current guidelines (including cumulative construction and operational impacts of the proposal and other major projects in the vicinity of the project) and in consultation with relevant land owners (such as the Ports Authority of NSW and those land owners whose property is being acquired) | Socio-economic impacts – Section 6 Cumulative impacts – Section 6.9 and Chapter 27 (Cumulative impacts) of the environmental impact statement Consultation – Chapter 7 (Stakeholder and community engagement) of the environmental impact statement |
| 2. The Proponent must assess impacts from construction and operation on potentially affected properties, businesses, recreational users and land and water users (including potential cumulative impacts associated with use of Glebe Island and White Bay in consideration of other major | Property impacts – Section 6.1 and Chapter 20 (Land use and property) of the environmental impact statement Business impacts – Appendix A of this report Impacts on recreational uses – Section 6.6 |

| Secretary's environmental assessment requirement | Where addressed |
|--|---|
| developments in the precinct), including amenity impacts (including from cumulative and extended construction time frames and construction fatigue), property acquisitions/adjustments, future land uses, access, relevant statutory rights, and community severance and barrier impacts resulting from the project. | <p>Impacts on land and water users –Section 6.8, Section 6.1 and Section 6.6</p> <p>Amenity impacts – Section 6.7</p> <p>Cumulative impacts and construction fatigue – Section 6.9 and Chapter 27 (Cumulative impacts) of the environmental impact statement</p> <p>Property acquisition – Section 6.1 and Chapter 20 (Land use and property) of the environmental impact statement</p> <p>Community severance and barrier impacts – Section 6.7.2 and Chapter 20 (Land use and property) of the environmental impact statement</p> |

2. Assessment methodology

This section provides an overview of the methodology for this socio-economic assessment, including the study area, study methodology and community and stakeholder consultation.

2.1 Study methodology

This assessment has been developed in accordance with the *Environmental Impact Assessment Practice Note N05 – Socio-economic assessment* (Roads and Maritime, 2013) and to address the socio-economic matters outlined in the environmental assessment requirements issued by the Secretary of the Department of Planning, Industry and Environment. Land use and property impacts due to the construction and operation of the project are addressed in Chapter 20 (Land use and property) of the environmental impact statement.

Socio-economic impact assessment involves identifying, assessing and evaluating changes to, or impacts on, communities, businesses and industry that are likely to occur as a result of a development, to inform mitigation or management of those impacts and to maximise benefits. The first step in the assessment of the project involved scoping the likely range of potential socio-economic impacts and identifying businesses and communities likely to be affected by the project. This was informed by:

- The Secretary's environmental assessment requirements for the project
- *Environmental Impact Assessment Practice Note N05 – Socio-economic assessment* (Roads and Maritime, 2013)
- Socio-economic assessments and business impact assessments carried out for relevant other road and transport infrastructure projects in NSW and elsewhere
- Outcomes of community and stakeholder consultation carried out for the project.

An outcome of step one also included the definition of the study area as described in Section 2.2.

The second step of the assessment involved describing existing socio-economic and business characteristics, values and conditions in the study area. The existing baseline involved consideration of both qualitative and quantitative analysis, including:

- Reviewing existing State and local government policies and strategies relevant to the social environment
- Analysing population and demographic data for communities in the study area, such as population size and growth, diversity, socio-economic disadvantage and housing, as well as data on employment and income, workers and visitors to the study area
- Reviewing existing social infrastructure near the project such as education facilities, health and emergency services, recreation uses and transport facilities
- Analysing existing business and industry characteristics
- Identifying existing community values relating to factors such as amenity and sense of place, access and connectivity, and community health and safety.

The description of existing socio-economic conditions principally draws on information from the Australian Bureau of Statistics (ABS) Census of Population and Housing 2016, supplemented with information and data from:

- Government agencies such as the ABS and local councils
- NSW Government and council publications, reports, guidelines and websites
- Community consultation previously carried out for the project
- Survey of businesses within the study area (refer to Section 2.1.1 for further details).

The next step for the socio-economic assessment involved identifying and evaluating changes to existing socio-economic and business conditions and values in the study area due to the project's construction and operation. This included direct and indirect benefits and impacts as well as cumulative impacts of other projects proposed, planned or under construction. The assessment considered potential project benefits and impacts relating to:

- Property impacts, including impacts of property acquisition and temporary lease of property for construction
- Equity, including the distribution of project benefits and impacts
- Potential changes to population and demography
- Employment, including direct and indirect employment impacts
- Business and industry, including from direct property impacts and changes in the local business environment
- Social infrastructure, including from property acquisition, temporary lease of land, and changes in local access and connectivity and amenity
- Community values, including changes to local amenity, community cohesion, local character and identity, health and safety, and environmental and natural features
- Changes to access and connectivity, including for pedestrians, cyclists, public transport users, maritime transport users, and motorists.

Cumulative impacts relating to socio-economic issues are also considered due to the potential for impacts from the project to interact or overlap with impacts from other projects within the study area.

An evaluation matrix was used to assess the potential socio-economic impacts, considering the likely extent, duration and severity of each impact and the consequences and probability of the impact occurring. Only negative impacts are assigned a level of significance. Further information on the evaluation matrix is provided in Section 2.1.2.

The final step of the assessment involved identifying measures to avoid, minimise or mitigate impacts on communities, social infrastructure and business and industry arising from the project.

2.1.1 Business impact assessment

This assessment has been informed by a business impact assessment prepared by HillPDA. A copy of the business impact assessment report is provided in Appendix A.

A business survey was conducted to inform the business impact assessment. The purpose of the survey was to understand how businesses near the project currently operate and issues, perceptions and concerns of businesses relating to the project's construction and operation. The business surveys were conducted in local centres that were considered to be more susceptible to direct or indirect effects of construction and/or operation of the project.

The survey was conducted by HillPDA over a three-week period in November 2017. Businesses were surveyed at nine locations across the study area. Businesses were approached at random with over 182 businesses participating in the survey. The survey covered a wide variety and representative sample of business types including retail shops, industrial premises, real estate agencies, cafes, pubs, restaurants, auto service centres and professional service businesses. Further engagement with business stakeholders will be carried out during the environmental impact assessment exhibition period.

Table 2-1 provides an overview of the nine locations and the number of businesses surveyed at each location. The number of surveys collected in each precinct varied slightly depending on the precinct's size and number of businesses present.

Table 2-1 Business surveys

| Survey location | Number of businesses surveyed |
|-------------------------------------|-------------------------------|
| Balmain Main Street | 17 |
| Miller Street Convenience, Cammeray | 17 |
| Neutral Bay Centre | 30 |
| North Sydney | 29 |
| Kirribilli Centre | 11 |
| Robert Street Industrial | 15 |
| Spit Junction | 18 |
| Victoria Road/Darling Street | 39 |
| Waverton Convenience | 6 |
| Total | 182 |

2.1.2 Evaluation of significance

This assessment considers both positive and negative social and economic impacts of the project's construction and operation; however, the methodology for evaluating significance requires that only negative impacts are assigned a level of significance. The level of significance of potential negative impacts was assessed by considering the sensitivity of the receptor and the magnitude of the proposed works (refer to Table 2-4).

Sensitivity of the existing environment

The sensitivity of a receptor (for example, communities, businesses, business clusters, social infrastructure, residences) to potential impacts of the project is influenced by its vulnerability to change and capacity to adapt. Qualities that contribute to the level of sensitivity may include such things as:

- Existing amenity, for example existing noise levels, visual amenity and air quality
- Demographic composition and patterns
- Economic activity and types of industry and/or businesses present
- Connectivity and access
- Property and land use types and known future changes
- Community values
- Existing levels of community cohesion
- Level of concern or individuals' perceptions about particular issues.

The levels of sensitivity are described in Table 2-2. The level of sensitivity of relevant sensitive receptors used for the evaluation of negative impacts was determined based on professional judgement with consideration of those qualities outlined above.

Table 2-2 Levels of sensitivity

| Sensitivity | Example |
|-------------|---|
| Negligible | No vulnerability and able to absorb or adapt to change |
| Low | Minimal areas of vulnerabilities and a high ability to absorb or adapt to change |
| Moderate | A number of vulnerabilities but retains some ability to absorb or adapt to change |
| High | Multiple vulnerabilities and/or very little capacity to absorb or adapt to change |

Magnitude of impact

The magnitude of an impact is dependent on its scale, duration, intensity and scope of works. Qualities of magnitude include such things as:

- Scale or intensity of an impact (for example, the type of works and operational uses)
- Spatial extent of an impact (for example, the geographical area or community groups affected impacted)
- Duration or reversibility of an impact (for example, short, medium or long-term, hours of works, frequency).

The levels of magnitude are described in Table 2-3. Professional judgement was used to determine the magnitude of an impact used for the evaluation of negative impacts.

Table 2-3 Levels of magnitude

| Magnitude | Example |
|------------|---|
| Negligible | No discernible positive or negative changes caused by the impact. Change from the baseline remains within the range commonly experienced by receptors. |
| Low | A discernible change from baseline conditions. Tendency is the impact is to a small proportion of receptors over a limited geographical area and mainly within the vicinity of the project. The impact may be short term or some impacts may extend over the life of the project. |
| Moderate | A clearly noticeable difference from baseline conditions. Tendency is the impact is to a small to large proportion of receptors and may be over an area beyond the vicinity of the project. Duration may be short to medium term or some impacts may extend over the life of the project. |
| High | A change that dominates over existing baseline conditions. The change is widespread or persists over many years or is effectively permanent. |

Assessing level of significance

In assessing the level of significance of negative impacts, consideration was given to:

- The range of potential direct and indirect impacts during construction and operation
- Cumulative impacts with other projects
- Whether potential impacts may be positive, negative or neutral.

Potential impacts have been considered using Table 2-4. The level of significance for potential negative impacts was determined with consideration of the sensitivity of the existing environment and magnitude of impact compared to the baseline condition.

Table 2-4 Assessing the level of significance

| | | Magnitude | | | |
|-------------|------------|----------------------|----------------------|---------------------|-------------------|
| | | High | Moderate | Low | Negligible |
| Sensitivity | High | High impact | High-moderate impact | Moderate impact | Negligible impact |
| | Moderate | High-moderate impact | Moderate impact | Moderate-low impact | Negligible impact |
| | Low | Moderate impact | Moderate-low impact | Low impact | Negligible impact |
| | Negligible | Negligible impact | Negligible impact | Negligible impact | Negligible impact |

2.2 Study area

The study area for this socio-economic assessment includes those communities that may experience changes to socio-economic conditions due to the location of the project, construction activities and changes in travel patterns for residents, workers and visitors. It comprises the ABS Statistical Areas Level 2 (SA2) geographies that either overlap or are located near the project and that section of Sydney Harbour next to the project alignment.

For the purposes of this assessment, the study area has been divided into two 'precincts' located north and south of Sydney Harbour. The ABS SA2 geographies within each precinct include:

- South Harbour Precinct:
 - Leichhardt-Annandale
 - Lilyfield-Rozelle
 - Balmain
- North Harbour Precinct:
 - North Sydney-Lavender Bay
 - Neutral Bay-Kirribilli
 - Crows Nest-Waverton
 - Mosman
 - Cremorne-Cammeray
 - St Leonards-Naremburn.

Some benefits and impacts would also be experienced by wider communities. As such, this assessment also considered potential impacts on communities and businesses in the Inner West, North Sydney and Willoughby local government areas and the Greater Sydney region at a broader level, where relevant.

The study area is shown in Figure 2-1a and Figure 2-1b. Table 2-5 provides a summary of the SA2 areas in the study area, along with the corresponding local government area.

Table 2-5 SA2 areas in the study area

| ABS geography | Referred to in this social impact assessment | Local government area |
|-------------------------------|--|-----------------------|
| Leichhardt-Annandale SA2 | Leichhardt-Annandale | Inner West Council |
| Lilyfield-Rozelle SA2 | Lilyfield-Rozelle | |
| Balmain SA2 | Balmain | |
| Cremorne-Cammeray SA2 | Cremorne-Cammeray | North Sydney Council |
| North Sydney-Lavender Bay SA2 | North Sydney-Lavender Bay | |
| Neutral Bay-Kirribilli SA2 | Neutral Bay-Kirribilli | |
| Crows Nest-Waverton SA2 | Crows Nest-Waverton | |
| Mosman SA2 | Mosman | Mosman Council |
| St Leonards-Naremburn SA2 | St Leonards-Naremburn | City of Willoughby |

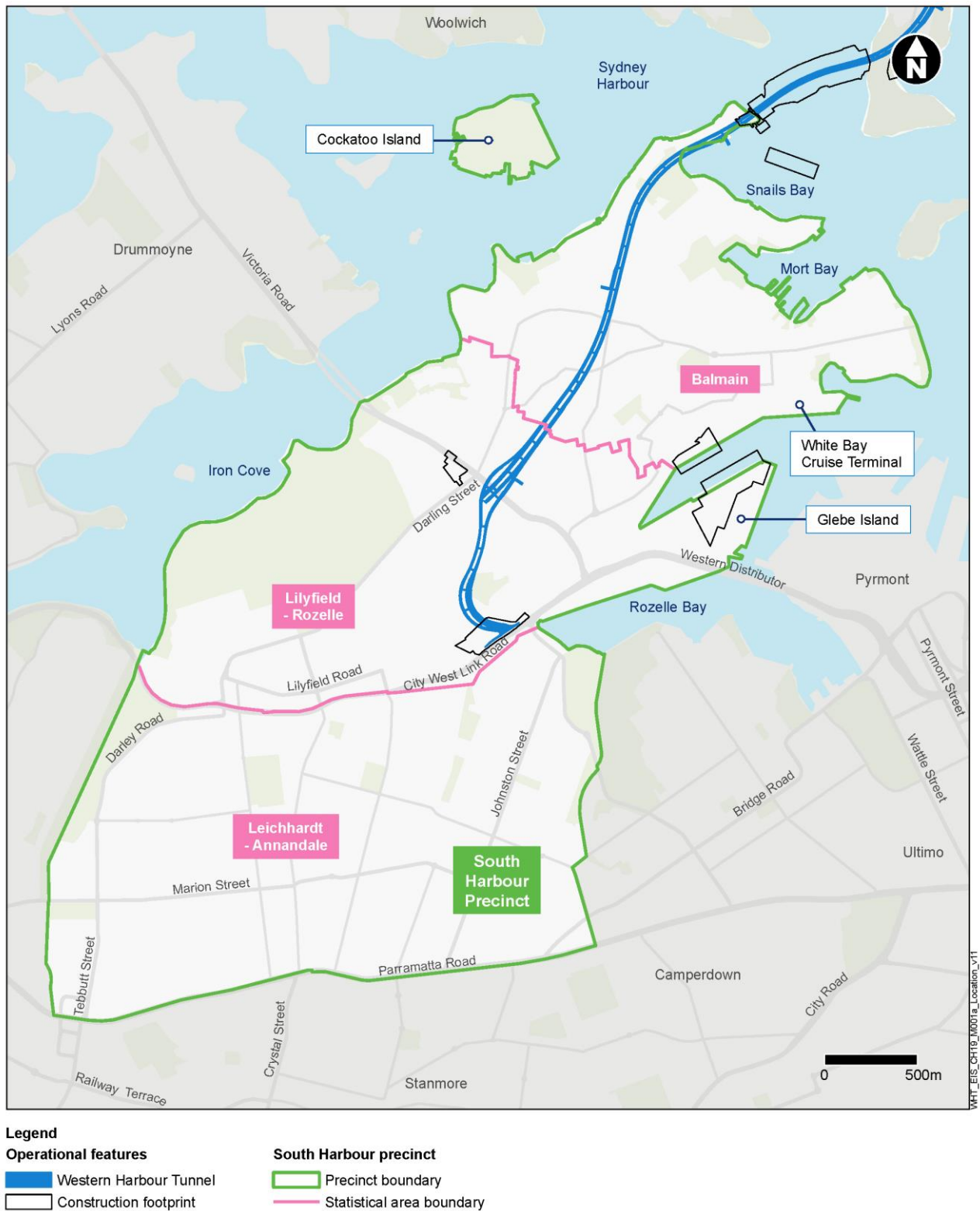


Figure 2-1a Socio-economic assessment study area (South Harbour Precinct)

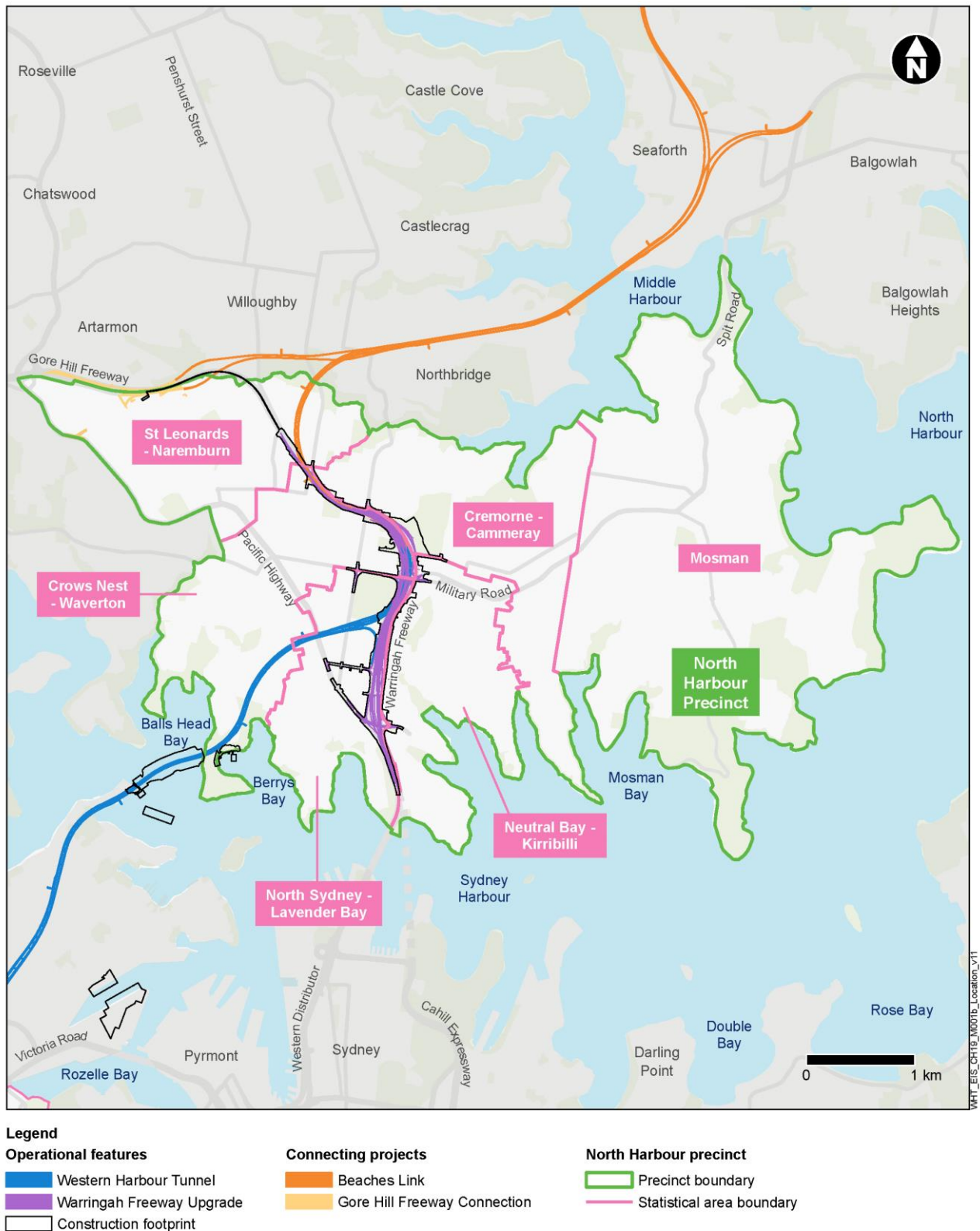


Figure 2-1b Socio-economic assessment study area (North Harbour Precinct)

2.3 Community and stakeholder engagement

Community and stakeholder engagement, including consultation with relevant land owners (such as the Ports Authority of NSW and owners of property being acquired), local communities, businesses and government agencies, has informed the project's development. This assessment has been informed by the outcomes of this engagement, including the identification of existing features and values important to communities in the study area, and assessment of potential benefits and impacts of the project.

Chapter 7 (Stakeholder and community engagement) of the environmental impact statement provides an overview of community and stakeholder engagement carried out for the project, along with the key issues raised. A summary of the key socio-economic issues raised through community and stakeholder engagement is provided in Section 5 of this report.

3. Socio-economic policy context

This section provides an overview of the broader social and economic policies and strategies relevant to the project and study area.

3.1 National and State strategies

Chapter 3 (Strategic justification and project need) of the environmental impact statement provides a description of National and State strategic planning and transport policies which are relevant to the project. These include:

- *Australian Infrastructure Plan: The Infrastructure Priority List* (Infrastructure Australia, 2016)
- *NSW 2021: A plan to make NSW number one* (NSW Government, 2011)
- *NSW State Infrastructure Strategy 2018-2038* (Infrastructure NSW, 2018)
- *NSW Long Term Transport Master Plan* (Transport for NSW, 2012)
- *Future Transport Strategy 2056* (NSW Government, 2018)
- *A Plan for Growing Sydney* (NSW Government, 2014)
- *Towards our Greater Sydney 2056* (Greater Sydney Commission, 2016)
- *North District Plan* (Greater Sydney Commission, 2018)
- *NSW Making it happen* (NSW Government, 2015)
- *Directions for a Greater Sydney* (Greater Sydney Commission, 2017)
- *NSW Freight and Ports Strategy* (Transport for NSW, 2013a)
- *Sydney's Bus Future* (Transport for NSW, 2013b)
- *Sydney's Cycling Future* (Transport for NSW, 2013c)
- *Sydney's Walking Future* (Transport for NSW, 2013d)
- *Draft NSW Road Planning Framework* (currently being developed by Transport for NSW)
- *Action for Air* (NSW Department of Environment, Climate Change and Water, 2009).

The project would generally support the actions of these plans by reducing congestion, improving travel times and enhancing the reliability of the road network across Sydney and improving access to the north and north-east of Sydney.

3.2 Local government strategies

3.2.1 Inner West Council

Inner West Council was created in May 2016 from the merger of the former Ashfield, Leichhardt and Marrickville Councils. To guide the community vision and priorities for the Inner West Council, a *Statement of Vision and Priorities* (Inner West Council, 2016) (the Statement) was developed in consultation with residents to inform the development of the Inner West Council Community Strategic Plan.

The overall vision for the Inner West Council is, “*We are Inner West, land of the Gadigal and Wangal peoples, whose rich cultures, heritage and history we acknowledge and respect. Together we are an inclusive, passionate, creative, vibrant community united in our desire to build a great future for all who live and do business here*”.

The Statement identifies eight high level priorities that emerged through the engagement process. Those relevant to the project include:

- *Managing and planning for population growth:* The project would support population growth by improving road network performance, resilience and efficiency, enabling sustained growth and productivity across Sydney's Global Economic Corridor. The project would also improve access to the strategic centres of the Sydney central business district (CBD) and North Sydney, resulting in more people having access to jobs and services
- *Managing traffic congestion:* The project would relieve congestion on the Sydney road network and improve travel times and reliability on existing harbour crossings, and on access and bypass routes around the Sydney CBD
- *Improving accessibility and connectivity:* The project would improve access and connectivity on the local road network
- *Encouraging active transport:* The project would improve cycle connectivity along the Warringah Freeway corridor and Rozelle interchange. It is anticipated that these improvements in connectivity would encourage greater use of existing infrastructure by pedestrians and cyclists. The project would also result in a reduction in congestion on surface roads, which would contribute to improved conditions for cyclists.

3.2.2 North Sydney Council

The *North Sydney Community Strategic Plan 2013-2023* (North Sydney Council, 2013) (North Sydney Community Plan) identifies the community's main priorities and aspirations for its future and provides strategies for achieving these outcomes. The North Sydney Community Plan was prepared in partnership with local residents and businesses, to develop the vision of "*shaping a progressive, diverse and vibrant North Sydney Community*" and priorities and strategies to help manage inevitable change while protecting what the community values most.

The following lists the outcomes of the North Sydney Community Plan relevant to the project along with a summary of how the project would contribute to achieving these outcomes:

- *Improved traffic management:* The project would relieve congestion on the Sydney road network and improve travel times and reliability on existing harbour crossings, and on access and bypass routes around the Sydney CBD
- *North Sydney CBD is one of Australia's largest commercial centres:* The project would improve access to the strategic centres of the Sydney CBD and North Sydney CBD, resulting in more people having access to jobs and services
- *Community is connected:* The project would improve access and connectivity on the local road network, including access to social infrastructure
- *Enhanced community safety and accessibility:* The project would improve road safety by reducing road network congestion. The project would provide an alternative to the Sydney Harbour Bridge and Sydney Harbour Tunnel and would reduce congestion on these existing harbour crossings, which would result in associated improvements in road safety performance.

The North Sydney Community Plan recognises challenges for the local government area, including a growing and changing population and ageing infrastructure, and recognition that many private motor vehicles travel within and through North Sydney, leading to traffic congestion and impacting on pedestrian accessibility and amenity.

3.2.3 City of Willoughby

The *Willoughby City Strategy* (Willoughby City Council, 2013) (City Strategy) is Willoughby City Council's long-term strategy document. It sets the strategic direction for the City to 2025, its policies, services and activities, and is underpinned by the overarching principles of sustainability and social justice.

The City Strategy adopts six key strategic directions to support and implement the vision of “*Willoughby, the vital hub of the region, where residential, cultural, economic and environmental interests are respected and balanced, and our communities enjoy a diversity of lifestyles*”. The following outlines the key priorities identified in the City Strategy relevant to the project along with a summary of how the project would contribute to the achievement of these priorities:

- *Improve local accessibility and transport options between suburbs*: The project would improve access and connectivity on the local road network
- *Maintain a clean, safe and healthy public domain*: The project would improve road safety by reducing road network congestion. The project would provide an alternative to the Sydney Harbour Bridge and Sydney Harbour Tunnel and would reduce congestion on these existing harbour crossings, which would result in associated improvements in road safety performance. The project would provide new opportunities for improved urban amenity
- *Improve integration between transport modes*: By reducing network congestion, improving network resilience and increasing reliability in peak periods, a new harbour crossing would make bus routes on the Sydney Harbour Bridge a more attractive transport option, supporting and encouraging mode shift to public transport. A new harbour crossing could also allow new public transport routes to be developed in response to diverse travel demands and future social and economic development.

3.2.4 Mosman Council

The *Mosman Council Community Strategic Plan 2013-2023* (Mosman Council, 2013) (Mosman Community Strategic Plan) outlines the long-term strategy for the Mosman local government area. It sets the strategic direction for the local government area to 2023, including its vision, programs, directions and strategies.

The Mosman Community Strategic Plan includes a direction for “*transport infrastructure and services that are safe, efficient, provide Mosman-friendly solutions, and promote access and mobility*”. The following lists the strategies identified to meet this direction which are relevant to the project along with a summary of how the project would contribute to these:

- *Lobby State and Federal Government to improve transport along the Spit and Military Road corridor*: The Western Harbour Tunnel and Beaches Link program of works would form a new integrated north–south motorway connection that would reduce congestion, improve journey times, support rapid movement of people and freight, and enhance the resilience of the road network across Sydney. The Beaches Link project would relieve congestion on the Military Road/Spit Road corridor
- *Improve safety and accessibility in local streets through appropriate traffic management and increased opportunities for active transport*: The project would improve road safety by reducing road network congestion and support public transport, pedestrian and cyclist facilities.

4. Existing socio-economic environment

This section describes existing socio-economic characteristics and features of the study area to provide a baseline against which the project's socio-economic impacts can be assessed. This includes information on population and housing, the economy, community values, social infrastructure and transport and access.

4.1 Overview of precincts

4.1.1 South Harbour Precinct

The South Harbour Precinct is about five kilometres west of the Sydney CBD and extends from Sydney Harbour to the north and east to Parramatta Road to the south and Parramatta River to the west.

The precinct is predominantly residential with some industrial and commercial areas. Commercial areas comprise retail areas generally located next to Parramatta Road and commercial businesses supporting activities associated with the wharves and ports, including cafes and restaurants. The precinct also features both large-scale and small-scale wharves and port facilities, including the White Bay Cruise Terminal. Major educational facilities located within the precinct include the University of Sydney Rozelle Campus, comprising the Sydney College of the Arts.

The precinct is served by the City-West Link Road, Victoria Road and Parramatta Road. The Dulwich Hill Light Rail connects Central to Dulwich Hill, with light rail stations located near the project at Rozelle Bay and Lilyfield. Leichhardt North, Hawthorne and Taverners Hill stations are also located within the precinct. The South Harbour Precinct is serviced by passenger ferry services provided from wharves at Balmain, Balmain East and Birchgrove and bus services that use key bus corridors such as Victoria Road and other local streets. The White Bay Cruise Terminal is also located within the suburb of Rozelle.

4.1.2 North Harbour Precinct

The North Harbour Precinct is located north of the Sydney CBD on the northern side of Sydney Harbour and extends from Sydney Harbour to the south and east, to Flat Rock Creek and Gore Hill Freeway to the north, and the Pacific Highway to the west.

The precinct is predominantly a residential area, but also has substantial commercial areas such as at North Sydney and St Leonards. Significant bushland areas are located along the foreshore of Middle Harbour. Major features in the precinct include the North Sydney CBD, Admiralty House, Kirribilli House, Luna Park and the Sydney Harbour Bridge.

The precinct is served by the Bradfield Highway, the Pacific Highway, the Warringah Freeway and the Gore Hill Freeway. The T1 North Shore and Western rail line and T9 Northern rail line also traverse the precinct. The North Harbour Precinct is served by passenger ferry services that connect to terminals at McMahon's Point and Milsons Point and bus services on local roads and key corridors such as Warringah Freeway, Military Road and Pacific Highway.

4.2 Community profile

This section describes the existing population, demographic and housing characteristics of the study area and each precinct. This includes information on population and growth, age and cultural diversity, disadvantage, need for assistance and health, community values, social infrastructure and transport and access.

Population and demographic data for the study area are presented for the study area as a whole and for each precinct. This is compared to population and demographic data for the Greater Sydney region. Further information on population and demographic characteristics of individual SA2s is provided in Appendix B.

4.2.1 Population size and growth

The study area had an estimated resident population of about 170,757 people in 2016, of which about 65 per cent resided in the North Harbour Precinct (refer to Table 4-1). Between 2006 and 2016, the estimated resident population of the study area grew by about 22,759 people, an average growth rate of about 1.4 per cent annually. This was less than the rate of population growth in the Greater Sydney region over the same time period.

Within the study area, North Sydney-Lavender Bay recorded the greatest population growth with an average annual growth rate at 2.4 per cent over the 10-year period. St Leonards-Naremburn also recorded relatively high population growth compared to the Greater Sydney region with this area also the only SA2 to experience a growth in population between 2011 and 2016. This likely reflects the number of residential developments in the area.

Table 4-1 Population growth, 2006 to 2016

| Locality | Population | | | Population change (average annual growth) (%) | |
|------------------------|------------|-----------|-----------|---|-----------|
| | 2006 | 2011 | 2016 | 2011-2016 | 2006-2016 |
| South Harbour Precinct | 51,243 | 55,642 | 59,540 | 1.4 | 1.5 |
| North Harbour Precinct | 96,755 | 104,440 | 111,217 | 1.3 | 1.4 |
| Study area | 147,998 | 160,082 | 170,757 | 1.3 | 1.4 |
| Greater Sydney region | 4,256,161 | 4,608,949 | 5,029,768 | 1.8 | 1.7 |

Source: Based on 2016 ABS Regional Population Growth, Australia. Cat. 3218.0.

NSW Government information on population projections is available at a local government area level. Local government areas traversed by the study area are generally expected to experience lower rates of population growth over the 20 years to 2036 compared to the Greater Sydney region. Between 2016 and 2036, the combined population of local government areas traversed by the study area is projected to increase by an average rate of about 0.9 per cent annually, compared to about 1.6 per cent in the Greater Sydney region (refer to Table 4-2). The North Sydney local government area is projected to have the highest population growth, although this is predicted to be below growth for the Greater Sydney region. The Mosman local government area is predicted to experience the lowest population growth.

Table 4-2 Population projections

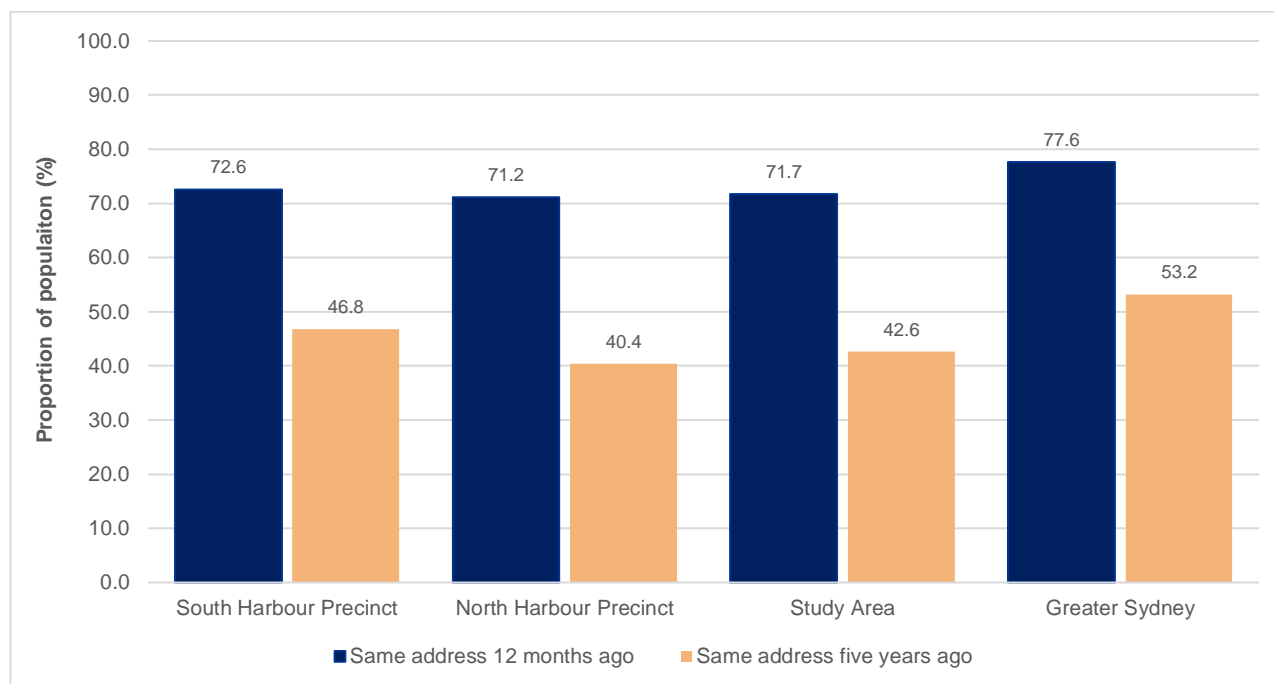
| Local government area | Population | | Population change (2016-2036) | |
|-----------------------|------------|-----------|-------------------------------|---------------------------|
| | 2016 | 2036 | Number | Average annual change (%) |
| Inner West | 190,500 | 232,100 | 41,600 | 1.0 |
| North Sydney | 72,150 | 91,650 | 19,500 | 1.2 |
| Willoughby | 75,450 | 88,650 | 13,200 | 0.8 |
| Mosman | 30,350 | 32,250 | 1,900 | 0.3 |
| Combined LGAs | 368,450 | 444,650 | 76,200 | 0.9 |
| Greater Sydney* | 5,021,350 | 6,837,000 | 1,815,650 | 1.6 |

*Note, comprises Sydney Metropolitan local government areas and Central Coast local government area

Source: Based on 2016 New South Wales State and Local Government Area Population Projections (Main series), Department of Planning and Environment.

The study area as a whole had higher levels of population mobility compared to the Greater Sydney region, with lower proportions of people who lived at the same address both one year and five years prior to the 2016 Census (refer to Figure 4-1). Within the study area, the South Harbour Precinct had lower levels of population

mobility compared to the North Harbour Precinct, with higher proportions of people who lived at the same address both one year and five years prior to the 2016 Census.

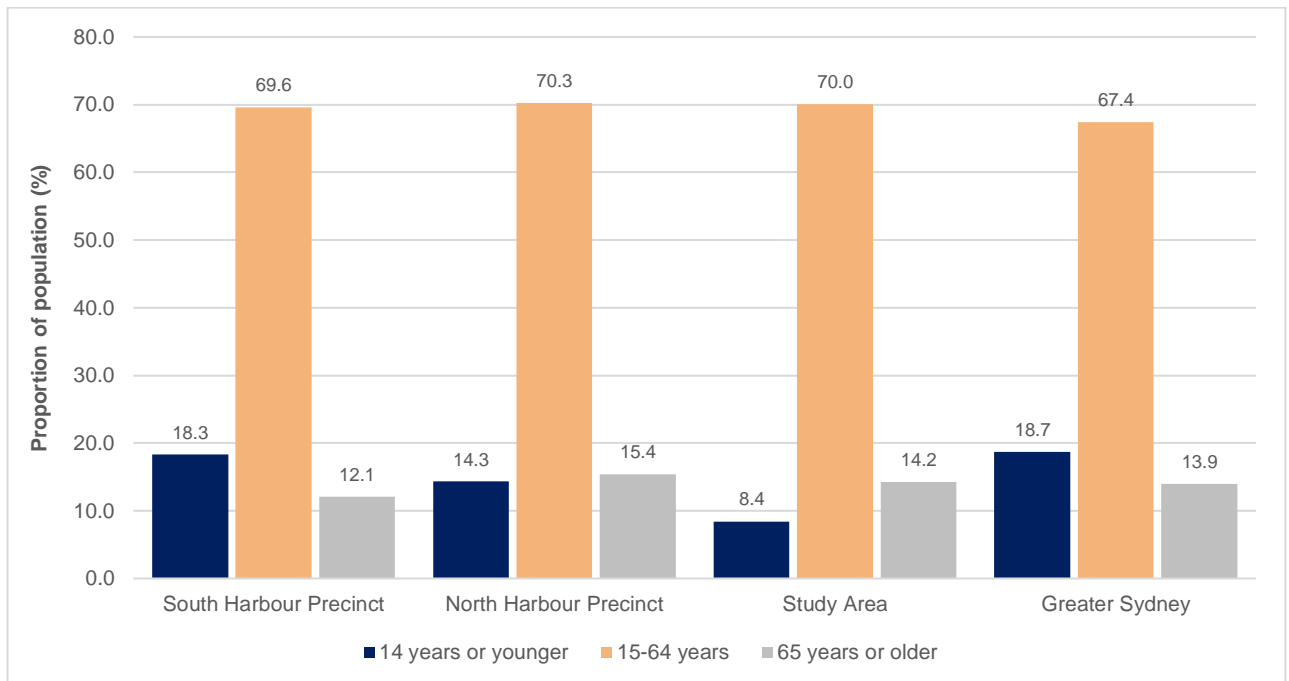


Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics

Figure 4-1 Population mobility, 2016

4.2.2 Age profile

The study area as a whole had an older population compared to the Greater Sydney region, with a higher median age, marginally higher proportions of elderly people (aged 65 years or older) and lower proportions of children (aged 14 years or younger) (refer to Figure 4-2). The North Harbour Precinct had a lower proportion of children and higher proportions of working aged people (that is 15 to 64 years) and elderly people, compared to the South Harbour Precinct. Leichhardt-Annandale recorded the highest proportion of children within the study area, while Mosman had the highest proportion of elderly people within the study area. North Sydney-Lavender Bay, St Leonards-Naremburn and Crows Nest-Waverton recorded the highest proportions of working aged people, with this group comprising about 75 per cent of people in each SA2.

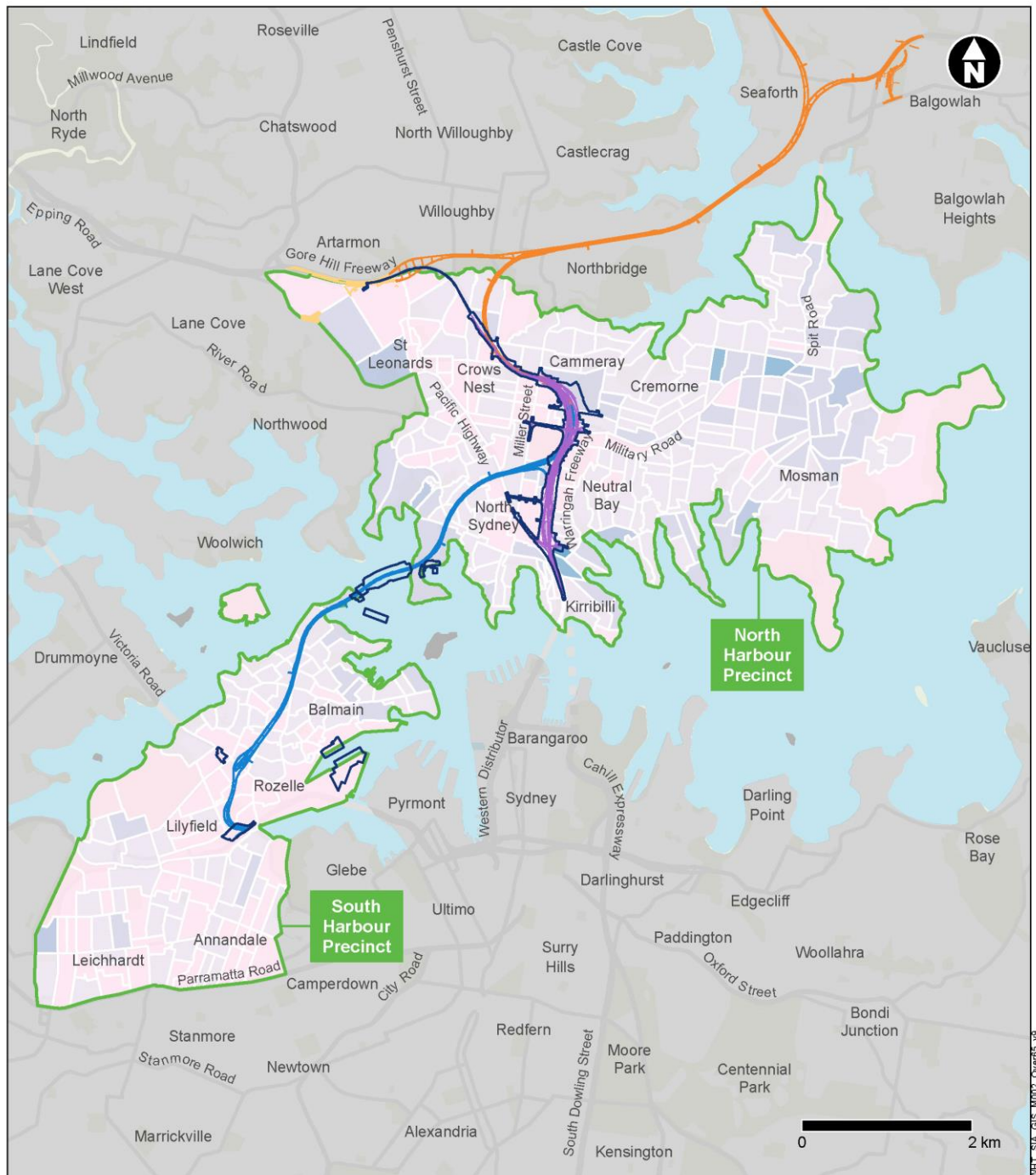


Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Figure 4-2 Age profile, 2016

Figure 4-3 shows the proportion of people aged 65 years or over near the project. Communities near the Rozelle Interchange and along the tunnel alignment south of Sydney Harbour generally comprise lower proportions of older people. Communities along the tunnel alignment at McMahon's Point and North Sydney and surrounding Cammeray Golf Course generally display higher proportions of older people. Higher proportions of older people are also located near the Warringah Freeway/High Street intersection, which is likely to reflect the location of aged care facilities nearby, including the James Milson Village at Clark Road, North Sydney.

Figure 4-4 shows the proportion of children aged 14 years or younger near the project. Communities south of Sydney Harbour generally display higher proportions of children than communities north of Sydney Harbour.



Legend

Operational features

- Construction footprint
- Western Harbour Tunnel
- Warringah Freeway Upgrade

- Precinct

Connecting projects

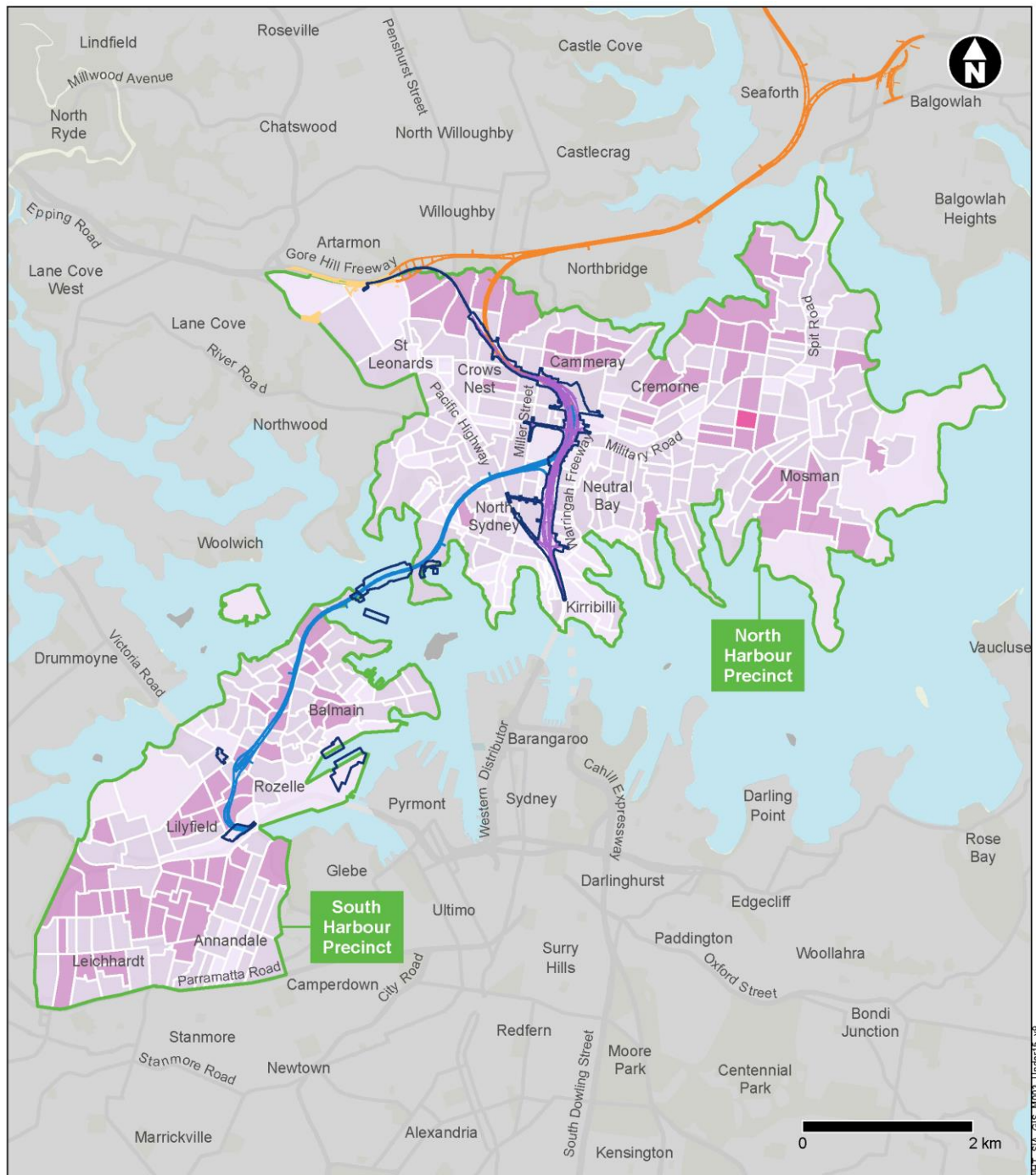
- Beaches Link
- Gore Hill Freeway Connection

Percentage of people aged 65 years and older

- Less than 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- 80% - 90%
- 90% - 100%

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics

Figure 4-3 Proportion of population aged 65 years or older near the project, 2016



Legend

Operational features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Construction footprint

- Precinct

Connecting projects

- Beaches Link
- Gore Hill Freeway Connection

Percentage of people aged 14 years and younger

- Less than 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- Over 50%

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics

Figure 4-4 Proportion of population aged 14 years or younger near the project, 2016

4.2.3 Cultural diversity

The study area recorded lower levels of cultural diversity compared to the Greater Sydney region, with communities in the study area recording lower proportions of people born overseas and people who speak a language other than English (refer to Table 4-3). Within the study area, the North Harbour Precinct generally displayed higher levels of cultural diversity in relation to birthplace and language.

Table 4-3 Cultural diversity, 2016

| Locality | Indigenous (%) | Born overseas (%) | Speaks a language other than English (%) |
|------------------------|----------------|-------------------|--|
| South Harbour Precinct | 1.0 | 28.0 | 15.3 |
| North Harbour Precinct | 0.3 | 37.1 | 21.1 |
| Study area | 0.5 | 33.9 | 19.1 |
| Greater Sydney region | 1.5 | 36.8 | 35.8 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

In 2016, the most common countries of birth for overseas born people within the study area included:

- England (6.9 per cent of the study area's total population)
- New Zealand (2.9 per cent)
- China (2.1 per cent).

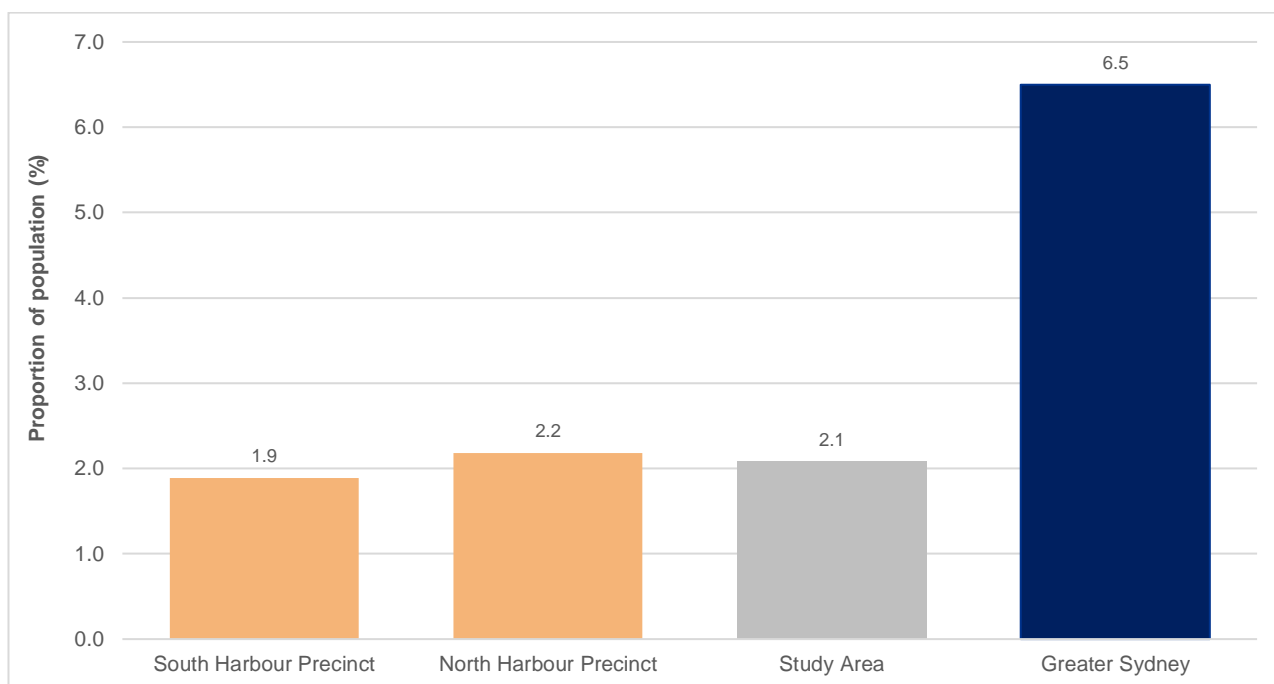
Within the study area, St Leonards-Naremburn recorded the highest proportion of people born overseas (44.7 per cent), followed by North Sydney-Lavender Bay (42.7 per cent) and Crows Nest-Waverton (38 per cent).

About 19.1 per cent of people in the study area spoke a language other than English at home at the time of the 2016 Census, well below the average for the Greater Sydney region (35.8 per cent). Within the study area, St Leonards-Naremburn, North Sydney-Lavender Bay, Crows Nest-Waverton and Neutral Bay-Kirribilli had proportions of people who spoke a language other than English above the study area average. The most common languages other than English spoken by people in the study area included:

- Chinese languages, for example, Mandarin and Cantonese (4.4 per cent)
- Italian (1.4 per cent)
- Indo-Aryan languages, for example, Hindi, Punjabi, Sinhalese and Urdu (1.4 per cent).

In 2016, about 2.1 per cent of people in the study area did not speak English well or at all. This was well below the Greater Sydney region average (6.5 per cent) (refer to Figure 4-5). St Leonards-Naremburn, North Sydney-Lavender Bay, Crows Nest-Waverton, Leichhardt-Annandale, and Lilyfield-Annandale areas recorded proportions of people who did not speak English well or at all higher than the study area average.

Overall, the study area had relatively low proportions of Indigenous people. At the time of the 2016 Census, about 848 people in the study area registered as Aboriginal and/or Torres Strait Islander. This represented about 0.5 per cent of the study area's total population, compared to about 1.5 per cent in the Greater Sydney region. While below the Greater Sydney region average, Leichhardt-Annandale had the highest proportion of Indigenous people in the study area (1.2 per cent), followed by Lilyfield-Rozelle (one per cent).



Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

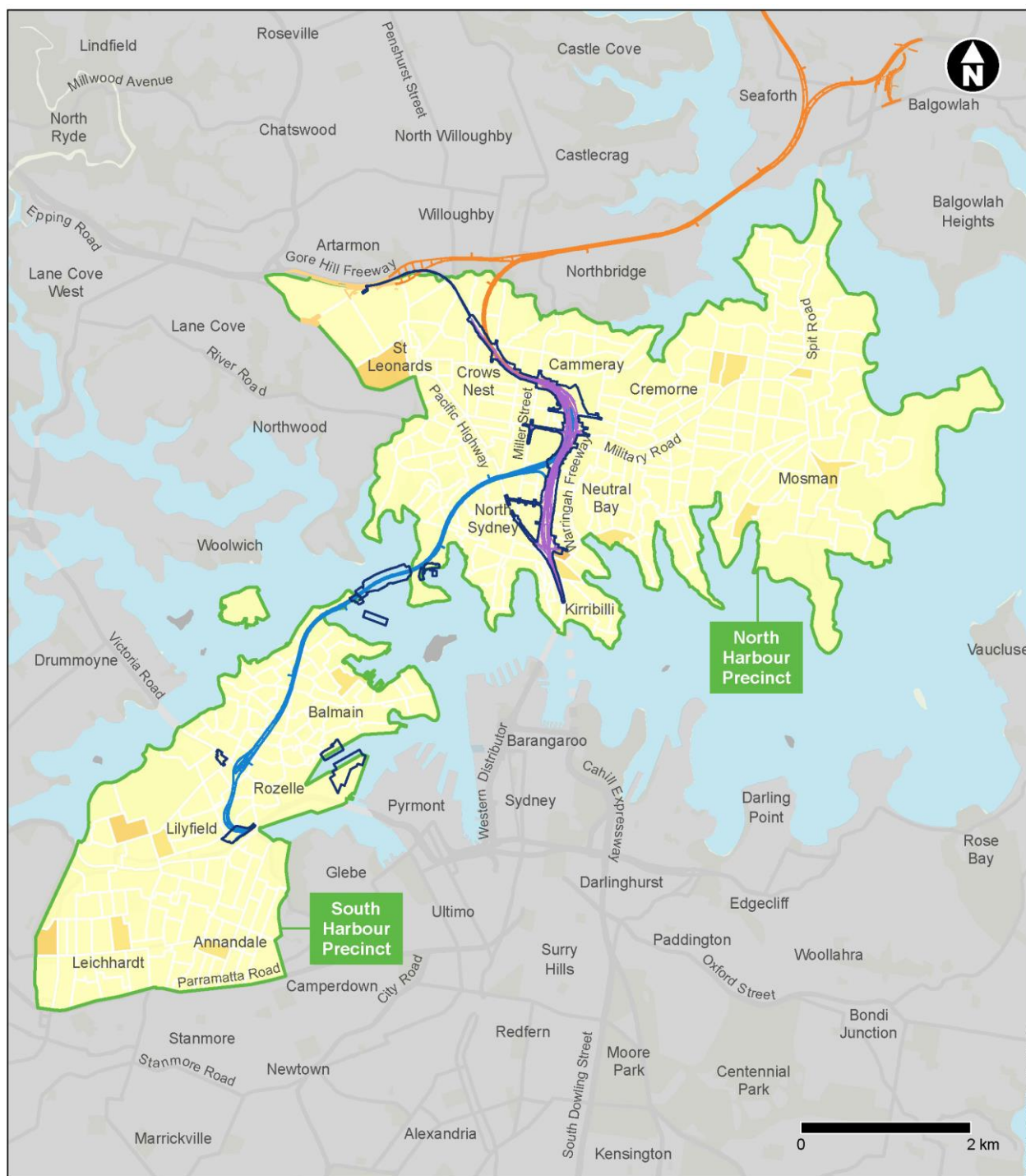
Figure 4-5 Speaks English not well or not at all, 2016

4.2.4 Vulnerability and need for assistance

ABS data on need for assistance refers to people who need help or assistance in one or more of the three core activity areas of self-help, mobility or communication due to disability, a long-term health condition or old age (ABS, 2016). People in this group may be more vulnerable to changes from the project, such as changes in local access, including to community services and facilities, effects associated with property acquisition, including loss of social and community networks, and changes in local amenity (that is, increased noise, dust and vibration).

Overall, the study area had a relatively low rate of people needing assistance compared to the Greater Sydney region. At the time of the 2016 Census, 2.7 per cent of people in the study area reported needing assistance in either self-help, mobility or communication, compared to 4.9 per cent in the Greater Sydney region. Within the study area, communities in the South Harbour Precinct demonstrated a higher need for assistance, recording a rate above the study area average (3.4 per cent), while communities in the North Harbour Precinct demonstrated lower proportions of people needing assistance (2.4 per cent). Leichhardt-Annandale recorded the highest proportion of people needing assistance (3.9 per cent), followed by Lilyfield-Rozelle (3.6 per cent), Mosman (3.1 per cent) and Neutral Bay-Kirribilli (three per cent).

Figure 4-6 shows the proportion of people reporting a need for assistance near the project. In the South Sydney Harbour precinct, small areas of higher proportions of people needing assistance were located at Balmain. North of Sydney Harbour, higher proportions of people needing assistance were recorded near the Warringah Freeway/High Street intersection, possibly reflecting the location of aged care facilities such as James Milson Village at Clark Road, North Sydney.



Legend

Operational features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Construction footprint

- Precinct

Connecting projects

- Beaches Link
- Gore Hill Freeway Connection

Percentage of people needing assistance

- Less than 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- Over 70%

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics

Figure 4-6 Proportion of people needing assistance near the project, 2016

4.2.5 Households and families

There were about 66,033 households in the study area at the time of the 2016 Census. Overall, the study area had higher proportions of lone person and group households and a lower proportion of family households compared to the Greater Sydney region (refer to Table 4-4).

Within the study area, the South Harbour Precinct had higher proportions of family or group households, while the North Harbour Precinct had higher proportions of lone person households. Within the study area, Mosman had the highest proportion of family households (67.7 per cent), while Neutral Bay-Kirribilli and North Sydney-Lavender Bay had the highest proportion of lone person households, at 38.9 per cent and 36.3 per cent respectively.

Table 4-4 Household composition, 2016

| Locality | Family household (%) | Lone person household (%) | Group household (%) | Number of households |
|------------------------|----------------------|---------------------------|---------------------|----------------------|
| South Harbour Precinct | 65.1 | 28.4 | 6.5 | 21,513 |
| North Harbour Precinct | 60.9 | 33.3 | 5.7 | 44,520 |
| Study area | 62.3 | 31.7 | 6.0 | 66,033 |
| Greater Sydney region | 73.6 | 21.6 | 4.7 | 1,623,872 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

4.2.6 Dwellings

There were about 73,808 private dwellings in the study area at the time of the 2016 Census, of which around 89.5 per cent were occupied (refer to Table 4-5). Occupancy rates in the study area were below the Greater Sydney region average, which likely reflects the higher levels of short-term rental accommodation in the inner city suburbs. Nearly 70 per cent (68 per cent) of dwellings in the study area are located within the North Harbour Precinct.

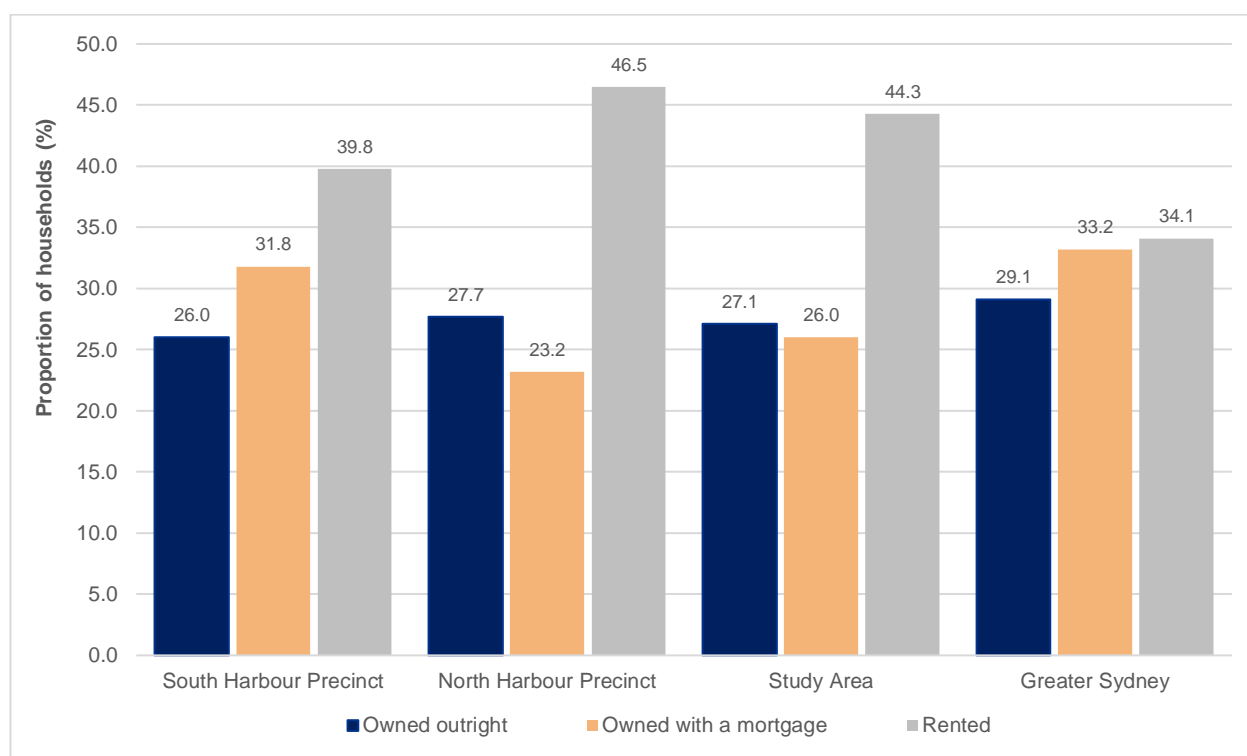
Overall, the study area recorded very low proportions of separate households and higher proportions of higher density housing compared to the Greater Sydney region. This is likely to reflect the study area's inner city location, and proximity to employment centres in the Sydney CBD and North Sydney. The North Harbour Precinct displayed higher residential densities, with flats, units or apartments comprising the most common dwelling type, while semi-detached houses comprised the most common dwelling type in the South Harbour Precinct.

Table 4-5 Dwelling structure, 2016

| Locality | Separate house (%) | Semi-detached house (%) | Flat, unit or apartment (%) | Total dwellings | Occupancy rate (%) |
|------------------------|--------------------|-------------------------|-----------------------------|-----------------|--------------------|
| South Harbour Precinct | 15.2 | 48.8 | 25.5 | 23,630 | 91.0 |
| North Harbour Precinct | 16.1 | 12.0 | 60.2 | 50,178 | 88.7 |
| Study area | 15.8 | 23.8 | 49.1 | 73,808 | 89.5 |
| Greater Sydney region | 52.5 | 12.9 | 25.9 | 1,759,927 | 92.3 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

In 2016, the study area had relatively high proportions of households that were renting and low proportions of owner occupied houses (that is, houses owned outright or owned with a mortgage) (refer to Figure 4-7). Within the study area, Neutral Bay-Kirribilli had the highest proportion of rental dwellings (54.9 per cent), followed by North Sydney-Lavender Bay (56.4 per cent) and St Leonards-Naremburn (50.6 per cent).



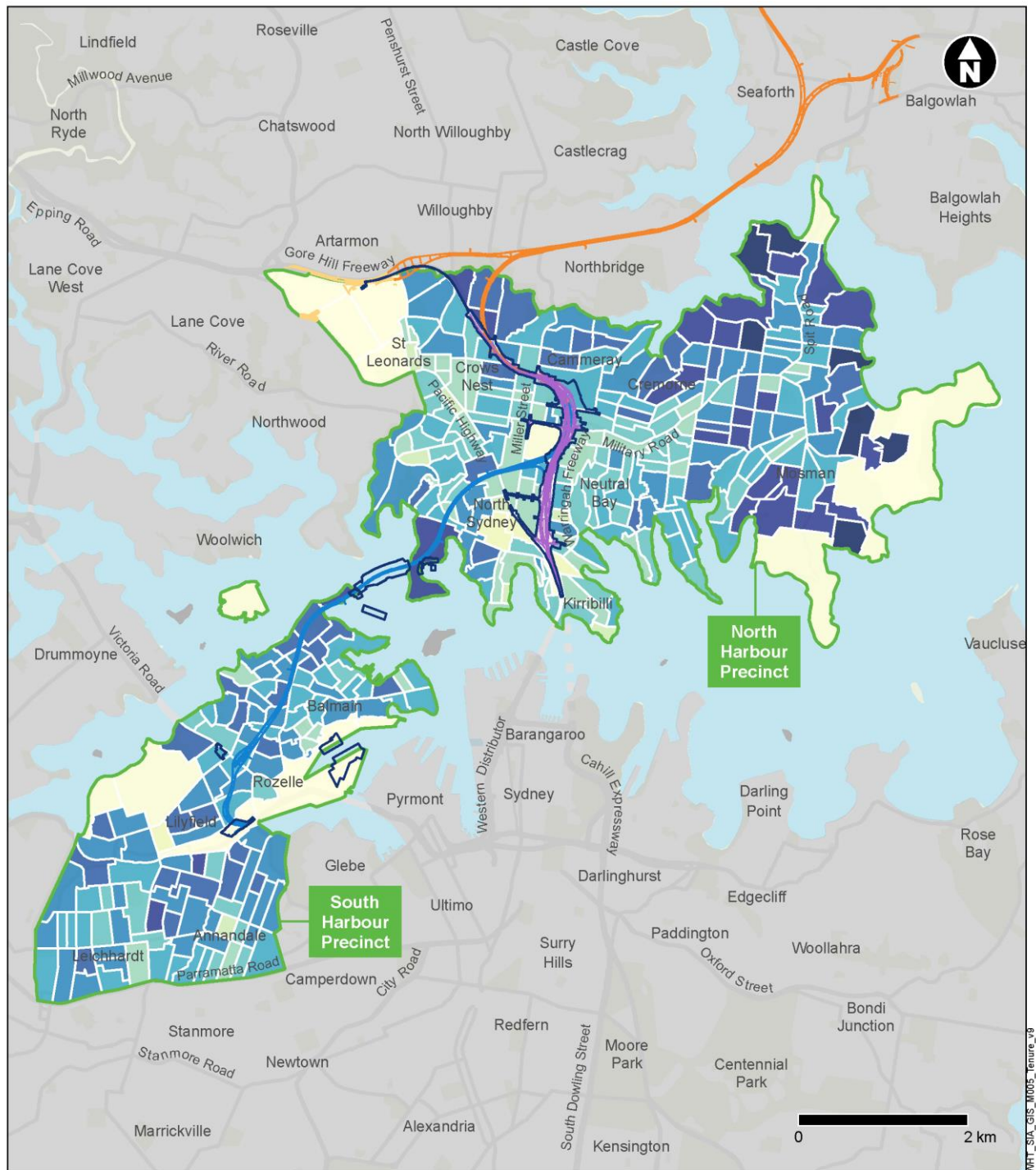
Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Figure 4-7 Tenure type, 2016

Figure 4-8 shows the proportion of dwellings owned outright or with a mortgage near the project. At the time of the 2016 Census, communities along the tunnel alignment at Balmain and Birchgrove included relatively high proportions of owner-occupied households. North of Sydney Harbour, communities in McMahons Point had relatively high proportions of owner-occupied households, while communities along the tunnel alignment at North Sydney generally had lower proportions of households owned outright or with a mortgage.

At the time of the 2016 Census, 1463 occupied private dwellings in the study area were being rented from a State housing authority, representing about 2.2 per cent of total occupied private dwellings in the study area. This was below the proportion of State rental housing in the Greater Sydney region (4.2 per cent). The South Harbour Precinct had levels of State rental housing above the North Harbour Precinct and consistent with the Greater Sydney region, with 4.2 per cent of occupied private dwellings (913 dwellings) being rented from a State or Territory housing authority. About 1.2 per cent of occupied private dwellings (550 dwellings) in the North Harbour Precinct were rented from a State housing authority. Within the study area, Lilyfield-Rozelle and Balmain both had proportions of State rental housing above the Greater Sydney region average.

In addition to State rental housing, about 249 occupied private dwellings in the study area were rented from a housing cooperative, community or church group. This represented about 0.4 per cent of occupied private dwellings in the study area, which was slightly below the Greater Sydney region average (0.6 per cent). Leichardt-Annandale was the only SA2 within the study area with proportions of dwellings rented from a housing cooperative, community or church group above the Greater Sydney region average.



Legend

Operational features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Construction footprint

- Precinct

Connecting projects

- Beaches Link
- Gore Hill Freeway Connection

Percentage of dwellings owned outright or with mortgage

- Less than 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- 80% - 90%
- 90% - 100%

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics

Figure 4-8 Proportion of dwellings near the project owned outright or with mortgage, 2016

4.2.7 Vehicle ownership

The study area generally had relatively low levels of vehicle ownership compared to the Greater Sydney region, with higher proportions of households without access to a vehicle and lower proportions of households with multiple vehicles (refer to Table 4-6). This likely reflects the proximity to major employment areas within or near the study area and high level of access to public transport and active transport options.

At the time of the 2016 Census, 82.8 per cent of households had access to at least one private vehicle, below the Greater Sydney region average (85.6 per cent). Mosman had the highest level of car ownership, with 87.7 per cent of households having access to at least one private vehicle. Cremorne-Cammeray and Lilyfield-Rozelle also had proportions of car ownership above the Greater Sydney region average.

Table 4-6 Vehicle ownership, 2016

| Locality | Households with no vehicle (%) | Households with one vehicle (%) | Households with two or more vehicles (%) |
|------------------------|--------------------------------|---------------------------------|--|
| South Harbour Precinct | 13.2 | 49.5 | 34.5 |
| North Harbour Precinct | 15.6 | 51.9 | 30.3 |
| Study area | 14.8 | 51.1 | 31.7 |
| Greater Sydney region | 11.1 | 37.1 | 48.5 |

Source: 2016 Census of Population and Housing, Australian Bureau of Statistics.

4.2.8 Income and employment

Communities in the study area had relatively high incomes compared to the Greater Sydney region, with higher personal and household median incomes, lower proportions of low income households (that is, with a weekly income of less than \$650) and higher proportions of high income households (that is, with a weekly income of \$2000 or more) (refer to Table 4-7). St Leonards-Naremburn, Leichhardt-Annandale, Neutral Bay-Kirribilli and Lilyfield-Rozelle had proportions of low income households above the study area average.

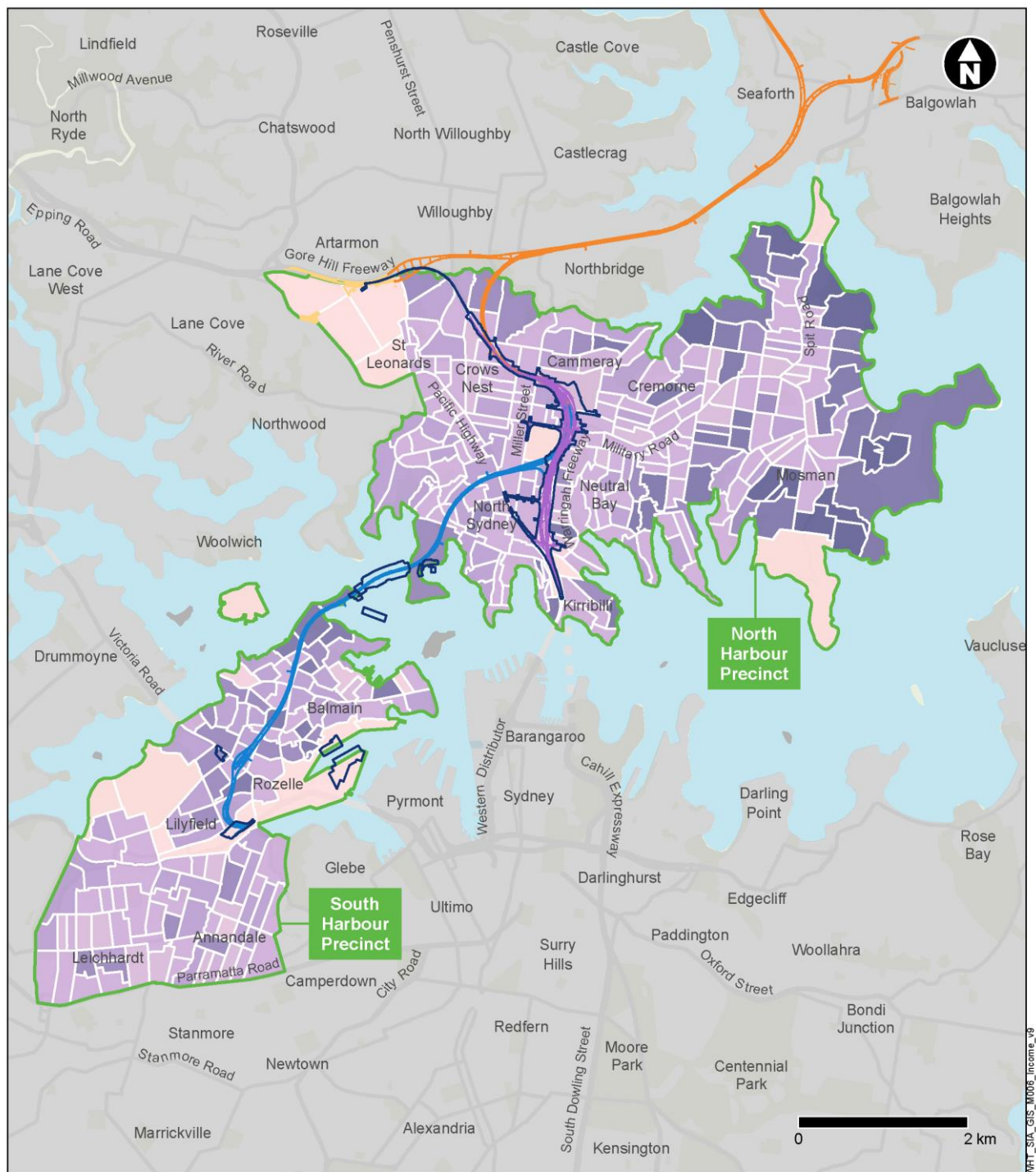
Figure 4-9 shows the distribution of median weekly household incomes near the project. At the time of the 2016 Census, communities along the tunnel alignment at Birchgrove and McMahon's Point generally displayed higher median incomes. Communities along the tunnel alignment north of Sydney Harbour generally had lower median household incomes compared to those south of Sydney Harbour.

Table 4-7 Household income, 2016

| Locality | Median total income (\$/week) | | Weekly household income (%) | |
|------------------------|-------------------------------|------------------|-----------------------------|----------------|
| | Personal income | Household income | <\$650 / week | >\$2000 / week |
| South Harbour Precinct | \$1278 | \$2525 | 4.1 | 76.9 |
| North Harbour Precinct | \$1368 | \$2400 | 3.8 | 78.6 |
| Study area* | \$1338 | \$2442 | 3.9 | 78.0 |
| Greater Sydney region | \$719 | \$1750 | 8.9 | 54.9 |

*Average of median incomes for SA2s in the study area

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.



Legend

Operational features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Construction footprint

- Precinct

Connecting projects

- Beaches Link
- Gore Hill Freeway Connection

Median weekly household incomes

- | | |
|---|---|
| — Less than \$500 | — \$2000 - \$2500 |
| — \$500 - \$1000 | — \$2500 - \$3000 |
| — \$1000 - \$1500 | — \$3000 - \$3500 |
| — \$1500 - \$2000 | — \$3500 - \$4000 |
| | — \$4000 - \$4500 |
| | — Over \$4500 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics

Figure 4-9 Median weekly household incomes near the project, 2016

There were about 93,536 people in the study area aged 15 years or over who were either employed or looking for work at the time of the 2016 Census. This represented a labour force participation rate of 69.1 per cent, which was above the average for the Greater Sydney region (61.6 per cent) (refer to Table 4-8).

The study area had a relatively low rate of unemployment, with 3.8 per cent of the study area's labour force unemployed at the time of the 2016 Census. This is compared to 6.0 per cent in the Greater Sydney region.

Table 4-8 Labour force, 2016

| Locality | Labour force | Labour force participation (%) | Unemployment (%) |
|------------------------|--------------|--------------------------------|------------------|
| South Harbour Precinct | 31,823 | 69.5 | 3.9 |
| North Harbour Precinct | 61,713 | 68.8 | 3.7 |
| Study area | 93,536 | 69.1 | 3.8 |
| Greater Sydney region | 2,418,899 | 61.6 | 6.0 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

4.2.9 Travel to work

At the time of the 2016 Census, car travel was the predominant mode of travel to work for residents in the study area, with about 38.0 per cent of people aged 15 years or over using a car for all or part of their journey to work (refer to Table 4-9). This was below the average for the Greater Sydney region, at 58.8 per cent. Within the study area, Mosman and Lilyfield-Rozelle had the highest proportion of residents who travelled to work by car, at 44.1 per cent and 44.0 per cent respectively, although this was still below the Greater Sydney region average. North Sydney-Lavender Bay had the lowest proportion of residents who used a car for all or part of their journey to work (25.0 per cent), which likely reflects the area's access to public transport such as rail services at North Sydney station and proximity to employment centres at North Sydney.

Compared to the Greater Sydney region, the study area recorded a higher proportion of people aged 15 years or over who used the bus for all or part of their journey to work and a marginally lower proportion of other vehicle users (for example truck, motorbike and taxi). The study area had a relatively high proportion of people who worked from home and a lower proportion of people who did not go to work, compared to the Greater Sydney region.

Table 4-9 Travel to work, 2016

| Method of travel | South Harbour Precinct (%) | North Harbour Precinct (%) | Study area (%) | Greater Sydney (%) |
|--|----------------------------|----------------------------|----------------|--------------------|
| One method | | | | |
| Train only | 2.1 | 13.5 | 9.6 | 10.9 |
| Bus only | 18.4 | 16.5 | 17.2 | 5.5 |
| Other public transport (including ferry) | 5.2 | 2.3 | 3.3 | 0.7 |
| Car only (as driver or passenger) | 41.4 | 35.1 | 37.2 | 56.6 |
| Walked or cycled | 8.4 | 10.4 | 9.7 | 4.8 |
| Truck | 0.3 | 0.1 | 0.2 | 0.9 |
| Motorbike/scooter | 1.5 | 0.9 | 1.1 | 0.7 |
| Other one method | 0.7 | 0.6 | 0.7 | 0.5 |
| Two methods | | | | |
| Train and car (as driver or passenger) | 0.4 | 0.4 | 0.4 | 1.8 |

| Method of travel | South Harbour Precinct (%) | North Harbour Precinct (%) | Study area (%) | Greater Sydney (%) |
|---|----------------------------|----------------------------|----------------|--------------------|
| Train and one other method (excluding car) | 3.7 | 3.6 | 3.6 | 2.9 |
| Bus and car (as driver or passenger) | 0.5 | 0.4 | 0.4 | 0.4 |
| Bus and one other method (excluding car) | 1.0 | 0.7 | 0.8 | 0.1 |
| Other two methods | 0.8 | 0.6 | 0.6 | 0.6 |
| Three methods | | | | |
| Train and two other methods | 0.6 | 0.8 | 0.7 | 0.6 |
| Bus and two other methods (excluding train) | 0.2 | 0.1 | 0.1 | 0.0 |
| Other three methods | 0.1 | 0.0 | 0.1 | 0.0 |
| Worked at home | 6.5 | 6.6 | 6.5 | 4.4 |
| Did not go to work | 7.6 | 6.7 | 7.0 | 7.8 |
| Method of travel not stated | 0.7 | 0.6 | 0.6 | 0.9 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

4.2.10 Worker population

ABS working population data provides information based on where a person goes to work. At the time of the 2016 Census, there were about 127,297 people who worked within the study area, of which 83.4 per cent worked within the North Harbour Precinct. North Sydney-Lavender Bay and St Leonards-Naremburn had the highest worker populations, representing about 38.5 per cent and 23.1 per cent of workers in the study area respectively. This reflects the major employment centres of the North Sydney CBD and St Leonards.

Professional, scientific and technical services was the main industry of employment for people working in the study area, employing 21.0 per cent of workers. Health care and social assistance was also a key industry (employing 12.5 per cent of workers in the study area) reflecting the presence of major hospitals such as the Royal North Shore Hospital and Mater Hospital. Other key industries of employment for people working in the study area include:

- Financial and insurance services (7.6 per cent)
- Information media and telecommunications (6.4 per cent), including telecommunications services and broadcasting
- Retail trade (6.2 per cent), particularly other store-based retailing and food retailing
- Education and training (6.0 per cent), particularly preschool and school education
- Construction (5.7 per cent), including building construction and construction services.

In 2016, about 44.8 per cent of people working in the study area travelled by car for all or part of their journey to work, compared to 58.3 per cent in the Greater Sydney region.

4.3 Social infrastructure

4.3.1 Social infrastructure in the study area

The study area accommodates a wide range of community services and facilities of local and regional importance, including education facilities; health, medical and emergency services; sport, recreation and leisure facilities; and community and cultural facilities.

Education facilities

Education facilities in the study area comprise early childhood, primary, secondary and tertiary level education facilities. This includes a number of education facilities of district and regional significance that are located near the project such as:

- TAFE NSW, which offers vocational training and tertiary education for about 42,300 students over six campuses across northern Sydney, including at St Leonards and Crows Nest
- Australian Catholic University North Sydney Campus, which provides tertiary education services to more than 10,000 students across multiple campuses, including at Edward Street, North Sydney
- University of Tasmania Sydney (Rozelle) Campus, located within Callan Park at Church Street, Lilyfield, which offers courses in paramedic practice and nursing
- University of Sydney – Sydney College of the Arts, located within Callan Park at Kirkbride Way, Lilyfield, which was the first tertiary art school in NSW (University of Sydney, undated).

Health and emergency services

Major hospitals and regional level health and emergency services facilities within the study area include:

- Balmain Hospital, located on Booth Street, Balmain, which provides aged care, rehabilitation and general practice services
- Ambulance Service of NSW headquarters, located on Balmain Road, Rozelle
- Royal North Shore Hospital, located on Reserve Road, St Leonards, which provides state-wide services including severe burns injury, neonatal intensive care, spinal cord injury, and interventional neuroradiology
- North Shore Private Hospital, located on Westbourne Street, St Leonards, which has 272 beds including 259 inpatient beds and provides teaching facilities to students at the University of Sydney
- Mater North Sydney Hospital, located on Rocklands Road, North Sydney, which provides 216 beds and includes intensive care, orthopaedic wards and a maternity unit.

In addition, a number of health and medical services and facilities are located across the study area that services the needs of local communities. These include medical centres, such as Rozelle Medical Centre, Doctors on Darling, Greenwood Medical Centre, Walker Street Doctors and Cammeray Medical Practice, and emergency services such as Balmain Police Station.

Sport, recreation, cultural and leisure facilities

The study area includes a range of formal and informal sport and recreation, and cultural and leisure facilities of regional importance. The following provides a summary of some key facilities in the study area:

- Callan Park, located on Wharf Road, Lilyfield, is “*one of the largest and most regionally significant public facilities in Sydney’s inner west*” covering over 60 hectares (Inner West Council, 2018) and accommodating facilities such as the University of Tasmania Sydney (Rozelle) Campus and University of Sydney – Sydney College of the Arts, Leichhardt Park, Leichhardt Park Aquatic Centre, Glover Street Sports Ground and King George Park
- Balls Head Reserve, located on Balls Head Drive, Waverton, includes bush walking tracks, barbeques, picnic tables and seats catering for local and regional communities and bush reservation projects carried out by the Balls Head Bushcare Group (North Sydney Council, 2016)
- Birchgrove Park, located on Birchgrove Road, Balmain, provides informal and formal recreation opportunities and includes tennis courts and a sports oval
- Waverton Park, located on Woolcott Street, Waverton on the foreshore of Sydney Harbour includes an area of open space, seats and picnic tables, and a children’s playground.

Sydney Harbour also supports a wide range of water based formal and informal sporting, recreation and leisure activities such as boating, fishing, sailing, rowing and kayaking, as well as many community groups and clubs. Key community groups and clubs using Sydney Harbour include paddle craft clubs; fishing clubs; sailing clubs such as Balmain Sailing Club, Drummoyne Sailing Club, Hunters Hill Sailing Club, Lane Cove 12 Foot Skiff Sailing Club, Greenwich Flying Squadron and Greenwich Sailing Club; sea scout and girl guide groups; and Marine Rescue NSW.

A number of boat storage and boat launching facilities are located in Sydney Harbour that provide storage for commercial and recreational vessels. These include moorings, dry dock storage facilities, marina facilities and boat ramps. In addition to marinas and boat ramps, mooring fields are located throughout Middle Harbour. This includes commercially and privately leased moorings. Mooring fields are also located throughout Port Jackson, including at Berrys Bay, Snails Bay and numerous other bays in the Outer Harbour, Inner Harbour, and Parramatta and Lane Cove Rivers.

Various foreshore reserves and sandy beaches are located around Sydney Harbour that offer public recreation for swimming and bathing. These include Camp Cove, Watsons Bay, Parsley Bay, Nielsen Park/Shark Beach, Blackburn Cove (Murray Rose Pool) and Clifton Gardens Reserve/Beach. Further discussion regarding Sydney Harbour is provided in Section 4.5.1.

Further information on Yurulbin Park, St Leonards Park and Cammeray Golf Course located near the project is provided in Section 4.3.2.

4.3.2 Social infrastructure near the project

This section provides an overview of social infrastructure located near the project that may be potentially affected by the project's construction and/or operation.

Yurulbin Park is a harbourside park located at Louisa Road in Birchgrove. It provides informal recreation opportunities including fishing and off-leash dog areas, and is also used for private functions such as wedding ceremonies (Inner West Council, undated). The park includes a wooden viewing platform overlooking Sydney Harbour and is a popular vantage point for the annual New Years' Eve fireworks at Sydney Harbour (City of Sydney, 2017). The park is of local heritage importance and is listed as a local heritage item in the Leichhardt Local Environmental Plan 2013 for its historical, social and aesthetic values. Birchgrove Wharf is located north of Yurulbin Park, which provides access to Sydney Ferry services between Cockatoo Island and Circular Quay. Surrounding land uses includes residential properties located along Louisa Road.

St Leonards Park is located at Miller Street in North Sydney. The park includes children's play equipment, two sports ovals (including North Sydney Oval and Bon Andrews Oval), junior synthetic cricket wickets and two practice nets, and two netball courts. A child care facility, a function centre and retail outlets are located at North Sydney Oval. St Leonards Park provides for informal recreational opportunities. The park is not used for organised sport or training, apart from North Sydney Oval which hosts a number of rugby league, rugby union, and amateur and professional cricket matches. North Sydney Oval is also used for the sunset cinema during summer months (North Sydney Council, 2017). St Leonards Park contains a Music Shell that hosts live music events as well as the North Sydney War Memorial that is used for the annual ANZAC Day Dawn Service. St Leonards Park is important for its local heritage values and is listed as a local heritage item in the North Sydney Local Environmental Plan 2013. The park also includes a number of native trees and historic plantings (NSW Office of Environment and Heritage, undated).

The Greens North Sydney is located at Ridge Street, North Sydney and within St Leonards Park. It is home to the North Sydney Bowling Club. The club hosts social lawn bowls as well as pennants competitions. The club was founded in 1888 and is the second oldest bowls club in NSW.

Cammeray Golf Course is located at Park Avenue in Neutral Bay. The golf course was established in 1906 and is a private nine-hole golf course. Part of the golf course was acquired for the Warringah Freeway in the 1960s, including a considerable area of the old course and adjoining playing fields (Cammeray Golf Club, undated). The golf course is available for visitors each day and holds weekday and weekend competitions for

club members along with a number of major club events throughout the year. The golf course includes a clubhouse with a function room which caters for corporate activities, conferences, weddings and other private events. The golf club also hosts a number of social events throughout the year. At 31 December 2018, the golf club had a total of 814 members, of which about 443 members were playing members (including honorary members, life members, country members and corporate members). This was an increase from 733 members in 2017 (434 playing members) (Cammeray Golf Club Limited, 2018).

Social infrastructure located near proposed surface works and construction activities are described in Table 4-10, while social infrastructure in the broader study area, which may be impacted due to such things as changes in traffic conditions or tunnelling construction, is shown in Figure 4-10a to Figure 4-10i and listed in Appendix C.

Table 4-10 Social infrastructure near proposed surface works and construction activities

| Type of facility | Facility | Location | Description |
|---|---|--|---|
| South Harbour Precinct | | | |
| Places of worship and cultural facilities | St Thomas' Anglican Church | Darling Street, Rozelle | The church holds two Sunday services at 10am and 5pm. |
| | Chapel Hill Rozelle Presbyterian Church | Darling Street, Rozelle | The church holds a Sunday service at 10:30am, including Kids Church for children up to Year 6. |
| Education facilities | Rozelle Public School | Darling Street, Rozelle | Public primary school offering primary education for students in Kindergarten to Year 6. In 2016, the school had an enrolment of 612 students (My School, 2017a). The Rozelle Public School Pre-School, located within the school, provides school education for about 40 students in two classes. The preschool operates Monday to Friday during the school term, between 9am and 3pm (Rozelle Public School, 2019). An out-of-school-hours care service operates on the school site providing before-school care (7.15am to 9am), after-school care (3pm to 6pm) and vacation care (7am to 6pm) for children in Kindergarten to Year 6. |
| | Petersham TAFE College (Annandale Campus) | Johnston Street, Annandale | Petersham TAFE College offers vocational training and tertiary education. |
| Childcare facilities | St Thomas' Rozelle Child Care Centre | Darling Street, Rozelle | The centre offers long day child care for children aged between two and five years. The centre is open Monday to Fridays from 7.30am to 5.30pm. |
| Health, medical and emergency services | Rozelle Medical Centre | Darling Street, Rozelle | The medical centre is open Monday to Friday (8am to 7pm) and Saturdays and Sundays (9am to 1pm). Bulk billing is available at the medical centre. |
| Aged care | St Basil's Annandale | Johnston Street, Annandale | The facility provides 83 beds for residential aged care, respite care, palliative care and secure dementia care (Aged Care Guide, undated). |
| Sport, recreation and leisure facilities | Buruwan Park | Corner of Railway Parade and Bayview Crescent, Annandale | Open space located between the corner of Railway Parade and Bayview Crescent and the rail corridor. |
| | Yurulbin Park | Louisa Road, Birchgrove | Yurulbin Park is a waterfront park, providing views of Sydney Harbour. The park is surrounded by residential properties located along Louisa Road. |

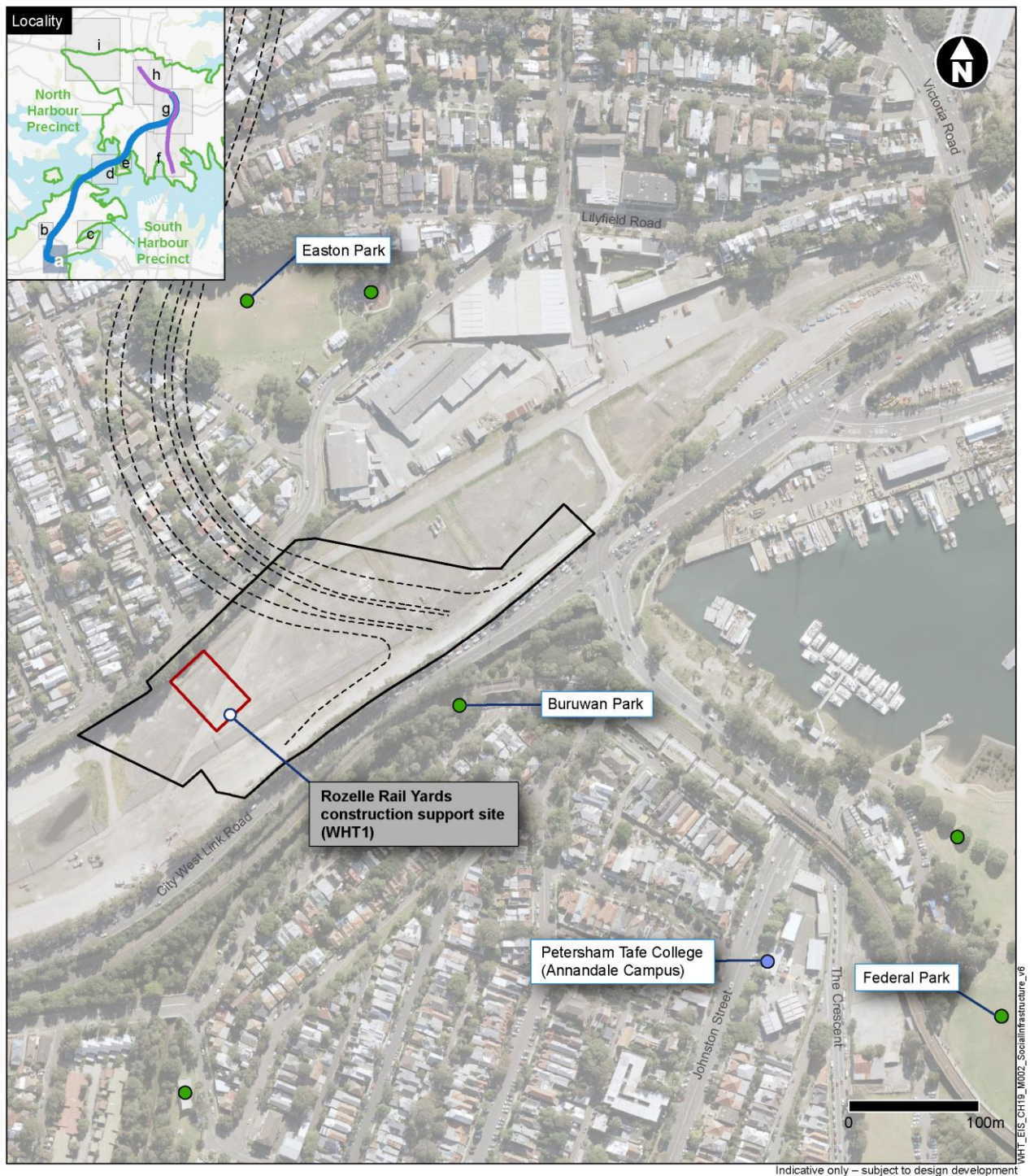
| Type of facility | Facility | Location | Description |
|---|---|--|---|
| | | | <p>The park provides opportunities for informal recreational activities. The park is also used for wedding ceremonies, fishing and off-leash dog areas.</p> <p>Yurulbin Park is a vantage point for the New Years' Eve fireworks at Sydney Harbour, providing free entry with a capacity of about 400 people.</p> <p>Birchgrove Wharf is located to the north of Yurulbin Park.</p> |
| Community support services | Rozelle Neighbourhood Centre | Darling Street, Rozelle | The centre provides group and individual services for people with a disability and their families and the elderly, as well as drop in sessions. The centre also provides community and cultural development services. |
| North Harbour Precinct | | | |
| Places of worship and cultural facilities | Church by the Bridge | Broughton Street, Kirribilli | The church provides regular services on Sunday morning, with other events also held at various times. |
| | Chinese Christian Church Sydney | Alfred Street, Milsons Point | The church provides regular services on Sunday, including services in English, Mandarin and Cantonese. |
| | International Society for Krishna Consciousness (ISKCON) Sydney | Falcon Street, North Sydney | ISKCON Sydney (also known as Hare Krishna) provides a number of regular temple services, weekly classes and Sunday school. |
| | Naremburn Cammeray Anglican Church | Willoughby Road, Naremburn | The church provides regular services on Sunday morning, with other events also held at various times. The church is currently being refurbished. |
| | Richard Bailey Library | Walker Street, North Sydney | The library forms part of the Australian Society for Anaesthetics and is open Monday to Friday (9am to 5pm), by appointment only. |
| Education facilities | St Aloysius College Junior School | Burton Street, Milsons Point | Provides primary and secondary school education for students in Year 3 to Year 12. In 2016, the school had an enrolment of 1246 students (My School, 2017b). |
| | Monte Sant Angelo Mercy College | Miller Street, North Sydney | Provides secondary school education for students (girls) in Year 7 to Year 12. In 2016, the school had an enrolment of 1164 students (My School, 2017c). |
| | ANZAC Park Public School | Corner of Ernest Street and ANZAC Avenue, Cammeray | Provides primary school education to students in Kindergarten to Year 6. The school opened in January 2016 and had an enrolment of 77 students in 2016 (My School, 2017d). The school's capacity is 1000 students and it is expected the school will grow rapidly in the next few years (ANZAC Park Public School, undated). |
| | Wenona School | Walker Street, North Sydney | The private girls school offers primary and secondary education to students in Kindergarten to Year 12. In 2016, the school had an enrolment of 1081 students. The school also provides accommodation for up to 50 boarders (My School, 2017e). The school also offers an after-school care service for students in Kindergarten to Year 6, which operates from 2.50pm to 6pm on school days. |
| | North Sydney Boys High School | Falcon Street, Crows Nest | The school provides secondary education for students in Year 7 to Year 12. In 2016, the school had an enrolment of 923 students (My School, 2017f). |

| Type of facility | Facility | Location | Description |
|----------------------|--|-------------------------------|--|
| | Marist College North Shore | Miller Street, North Sydney | The school provides secondary education for students in Year 7 to Year 12. In 2016, the school had an enrolment of 844 students (My School, 2017g). |
| | The Coal Loader Centre for Sustainability | Balls Head Drive, Waverton | The Coal Loader Centre for Sustainability is a “ <i>regional learning hub for sustainable living, showcasing innovation and best practice on sustainability</i> ” (North Sydney Council, undated). The centre includes a community garden and nursery, Aboriginal bush foods garden and rock engraving, historic coal loading tunnel, and a foreshore park and walks. The centre is used for activities and events by local communities and regularly hosts school visits. |
| Childcare facilities | KU Greenwood Children’s Centre | Pacific Highway, North Sydney | Provides child care facilities for babies, toddlers and pre-schoolers, generally between 7.30am and 6pm Monday to Friday. |
| | KU Tree Tops Child Care Centre | Miller Street, North Sydney | Provides child care facilities for babies, toddlers and pre-schoolers, generally between 7.30am and 6pm Monday to Friday. |
| | Toybox Early Learning | Miller Street, North Sydney | The day care centre caters for up to 38 children aged between six weeks and six years. The centre is open from 7.30am to 6pm Monday to Friday. |
| | Royal North Shore Hospital Child Care Centre | Pacific Highway, North Sydney | The day care centre provides long day care and is open from 6.45am to 6pm Monday to Friday. |
| | Guardian Early Learning (Walker Street) | Walker Street, North Sydney | The centre includes nursery, toddler, kindergarten and preschool programs and is open 8am to 6pm Monday to Friday. |
| | Guardian Early Learning (Arthur Street) | Arthur Street, North Sydney | The centre includes nursery, toddler, kindergarten and preschool programs and is open 8am to 6pm Monday to Friday. |
| | Only About Children North Sydney Campus | Berry Street, North Sydney | The centre is open 7am to 6pm Monday to Friday. |
| | Good Start Early Learning North Sydney | Berry Street, North Sydney | The centre provides child care services for up to 89 children, including nursery, toddlers, preschool and vacation care. |
| | Camp Blue North Sydney | Miller Street, North Sydney | Provides care for school students (Kindergarten to Year 9) during school holiday periods. |
| | KU Grandstand Kids Care and preschool | Fig Tree Lane, North Sydney | The centre provides after-school care Monday to Friday 3pm to 6pm. |
| | Only About Children Cammeray Campus | Miller Street, Cammeray | The centre is open from 7am to 6pm Monday to Friday. |
| | Happy Kids Family Day Care Cammeray | Massey Street, Cammeray | The centre provides day care services and is open Monday to Thursday 8am to 6pm. |
| | Naremburn Early Learning Centre | Donnelly Road, Naremburn | The centre provides day care services for children aged from six weeks to five years. |
| | White Rabbit Child Care Centre | Merrenburn Avenue, Naremburn | The centre provides long day care services and is open Monday to Friday 7.30am to 6pm. |

| Type of facility | Facility | Location | Description |
|--|--|-------------------------------------|--|
| | SND Northern Suburbs Children's Education and Care | Rodborough Avenue, Crows Nest | The centre provides day care services for up to 75 children aged between six weeks to six years. |
| | Alouette Child Care Centre | Rodborough Avenue, Crows Nest | Provides early learning services for children aged five years and under. |
| | Butterflies Early Learning Childcare Centre | Waltham Street, Artarmon | Provides early childhood and school readiness programs. The centre includes outdoor play spaces. The centre is open from 7am to 6pm, Monday to Friday. |
| Health, medical and emergency services | North Shore Medical Group | Alfred Street, Milsons Point | Provides vein, heart, weight-loss and homecare medical services. The facility also provides psychology and counselling services. |
| | Greenwood Medical Centre | Pacific Highway, North Sydney | General medical practice which is open Monday to Wednesday and Fridays (8am to 6pm) and Thursdays (8am to 9pm). |
| | North Sydney Medical Centre | Walker Street, North Sydney | General medical practice, skin cancer clinic and cosmetic medicine centre which is open Monday to Friday. |
| | North Sydney Plaza Medical Centre | Mount Street, North Sydney | General medical practice which is open Monday to Friday (8am to 6pm). |
| | Walker Street Doctors | Walker Street, North Sydney | General medical practice. |
| | Help Street Medical | Miller Street, North Sydney | Provides podiatry, physiotherapy, dietetics, speech, hydrotherapy services, as well as exercise classes. |
| | Miller Street Medical Practices | Walker Street, North Sydney | General medical practice. |
| | Harbour Radiology | Walker Street, North Sydney | Medical practice specialising in radiology, women's health imaging and other sub-specialty examinations. |
| | Cammeray Medical Practice | Miller Street, Cammeray | General medical practice open Monday to Friday (8am to 5.30pm) and Saturdays (8am to 12.30pm). |
| | North Sydney State Emergency Service | Balls Head Drive, Waverton | Volunteer emergency and rescue service. |
| | Artarmon Ambulance Superstation | Reserve Road, Artarmon | The Superstation supports the Artarmon Paramedic Response Network cluster and is where paramedics start and end their shifts. The facility includes parking for 20 ambulances, administration facilities, logistics and storage areas, and staff facilities. |
| Aged care | James Milson Village | Clark Road, North Sydney | The village provides retirement living and residential care, including 97 apartments in two buildings and 132 places for residential care. The village includes a library, chapel, hairdresser, function area and gym. |
| Sport, recreation and leisure facilities | Bradfield Park | Alfred Street, Milsons Point | Provides open space and informal recreation activities, as well as children's play equipment, and seats and picnic tables. The park is located near Luna Park and North Sydney Olympic Pool. |
| | Little Alfred Tennis/Kirribilli Tennis Centre | Little Alfred Street, Milsons Point | Provides three tennis courts available for public use. |
| | Park/open space at Kirribilli | Alfred Street | Provides an area of open space. |

| Type of facility | Facility | Location | Description |
|------------------|---|---|---|
| | Doris Fitton Park | Little Walker Street, North Sydney | Provides an area of open space. |
| | Merlin Street Reserve | Merlin Street, North Sydney | A small area of open space near residential properties. |
| | Rose Avenue Reserve | Rose Avenue, North Sydney | A small area of open space near residential properties. |
| | North Sydney Bowling Club | Ridge Street, North Sydney | Provides social and club bowls for the local community. The venue also hosts functions and other social events. |
| | St Leonards Park (including North Sydney Oval and Bon Andrews Oval) | Corner of Falcon Street and Miller Street, North Sydney | St Leonards Park provides informal and formal recreation opportunities, including a children's playground. North Sydney Oval is located within the park, which provides sports facilities, such as netball courts, cricket nets and wicket, and Bon Andrews Oval. The North Sydney Oval also contains a function centre and childcare facility. The North Sydney War Memorial is located at St Leonards Park. |
| | Jeaffreson Jackson Reserve | Moodie Lane, Cammeray | Provides an area of open space. |
| | ANZAC Park | Corner of Ernest Street and ANZAC Avenue, Cammeray | The park consists of open space and provides for informal recreational opportunities. In September 2017, North Sydney Council carried out consultation with the local community about the potential use of the park as a community garden. |
| | ANZAC Avenue Reserve | Cammeray Avenue, Cammeray | Area of open space providing informal recreational opportunities. |
| | Cammeray Golf Course | Corner of Ernest Street and Park Avenue, Neutral Bay | The golf course is a private nine-hole golf course. The facility also includes a function room which caters for corporate activities, conferences, weddings and other private events. |
| | Cammeray Tennis Club | Corner of Ernest Street and Park Avenue, Cammeray | The club includes four tennis courts and hosts club tennis, competitions, coaching and other social activities. |
| | Cammeray-Neutral Bay Skate Park | Ernest Street, Neutral Bay | Provides skate park facilities for the local community. |
| | Cammeray Croquet Club | Corner of Ernest Street and Park Avenue, Cammeray | Provides croquet facilities, including a number of playing sessions on the weekend and during the week. Friday morning hosts handicap croquet games. |
| | Cammeray Park | Park Avenue, Cammeray | The park provides for formal recreational opportunities, including synthetic turf for soccer and football. |
| | Green Park | Cammeray Road, Cammeray | The park includes an area of open space and two tennis courts. |
| | St Thomas Rest Park | West Street, Crows Nest | The park has social and historical significance and is the site of the first European cemetery on the North Shore (North Sydney Council, 2014). |
| | Carradah Park | Larkin Street, Waverton | The park is located next to Waverton Park on the foreshore of Sydney Harbour. The park contains lookout platforms and walking tracks. The park has Aboriginal and non-Aboriginal heritage significance. |
| | Balls Head Reserve | Balls Head Drive, Waverton | The reserve provides the local and regional community with bush walking tracks, barbeques, picnic tables and seats. Bush |

| Type of facility | Facility | Location | Description |
|----------------------------|-----------------------|----------------------------|--|
| | | | reservation at the reserve is carried out by the Balls Head Bushcare Group (North Sydney Council, 2016). |
| Community support services | The Kirribilli Centre | Fitzroy Street, Kirribilli | Provides services such as play group, counselling, legal advice and alcoholic anonymous support services for the local community. The centre also provides rooms which can be hired by members of the community. |



Legend

Construction features

- Tunnel section
- Construction footprint
- Construction support site

Social infrastructure

- Education and child care
- Sport, recreation and leisure facilities

Figure 4-10a Social infrastructure near the project



Legend

Construction features

- Tunnel section
- Construction footprint
- Construction support site

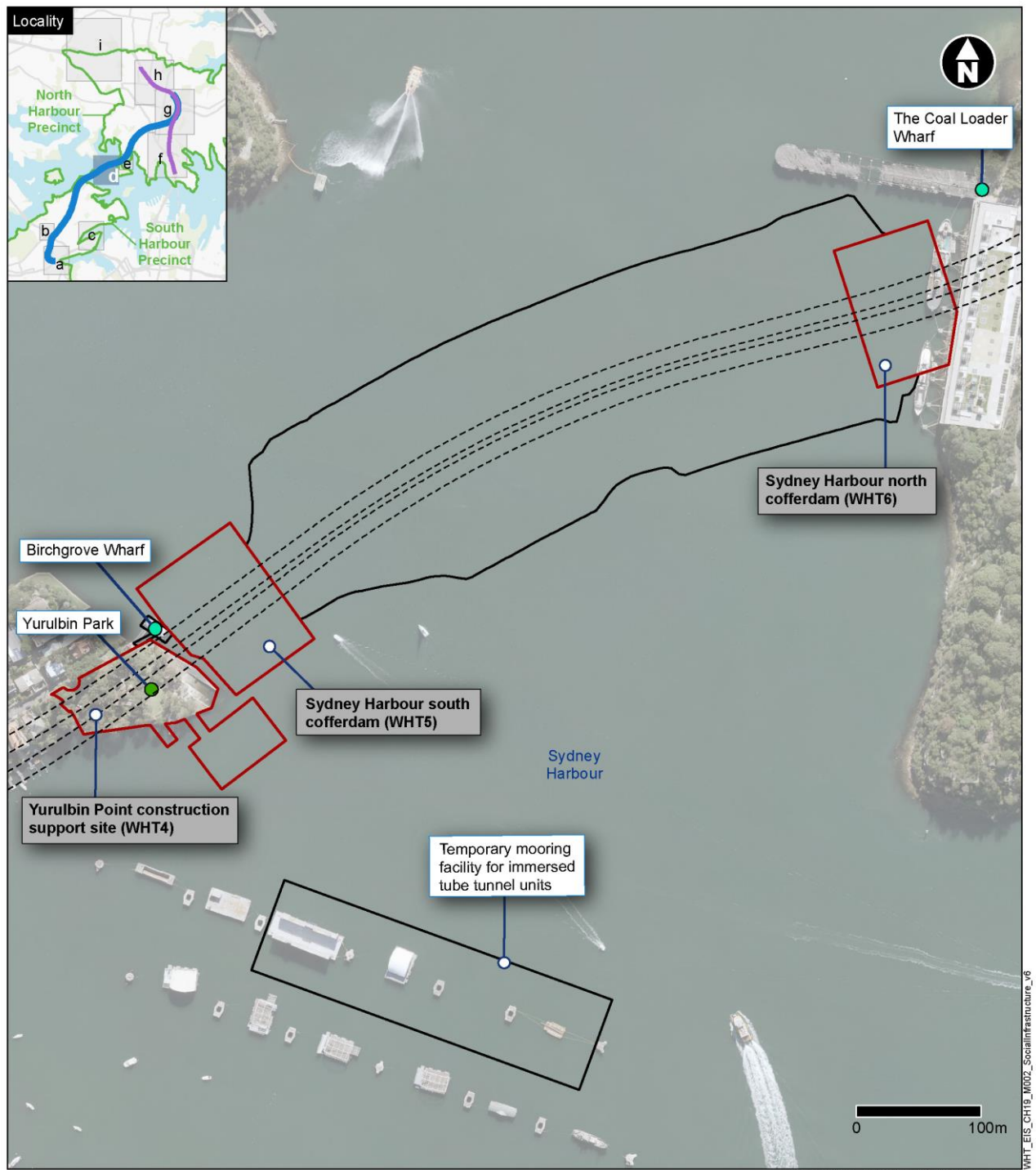
Social infrastructure

- Community centre
- Education and child care
- Health, medical and emergency services
- Places of worship

Figure 4-10b Social infrastructure near the project



Figure 4-10c Social infrastructure near the project



Legend

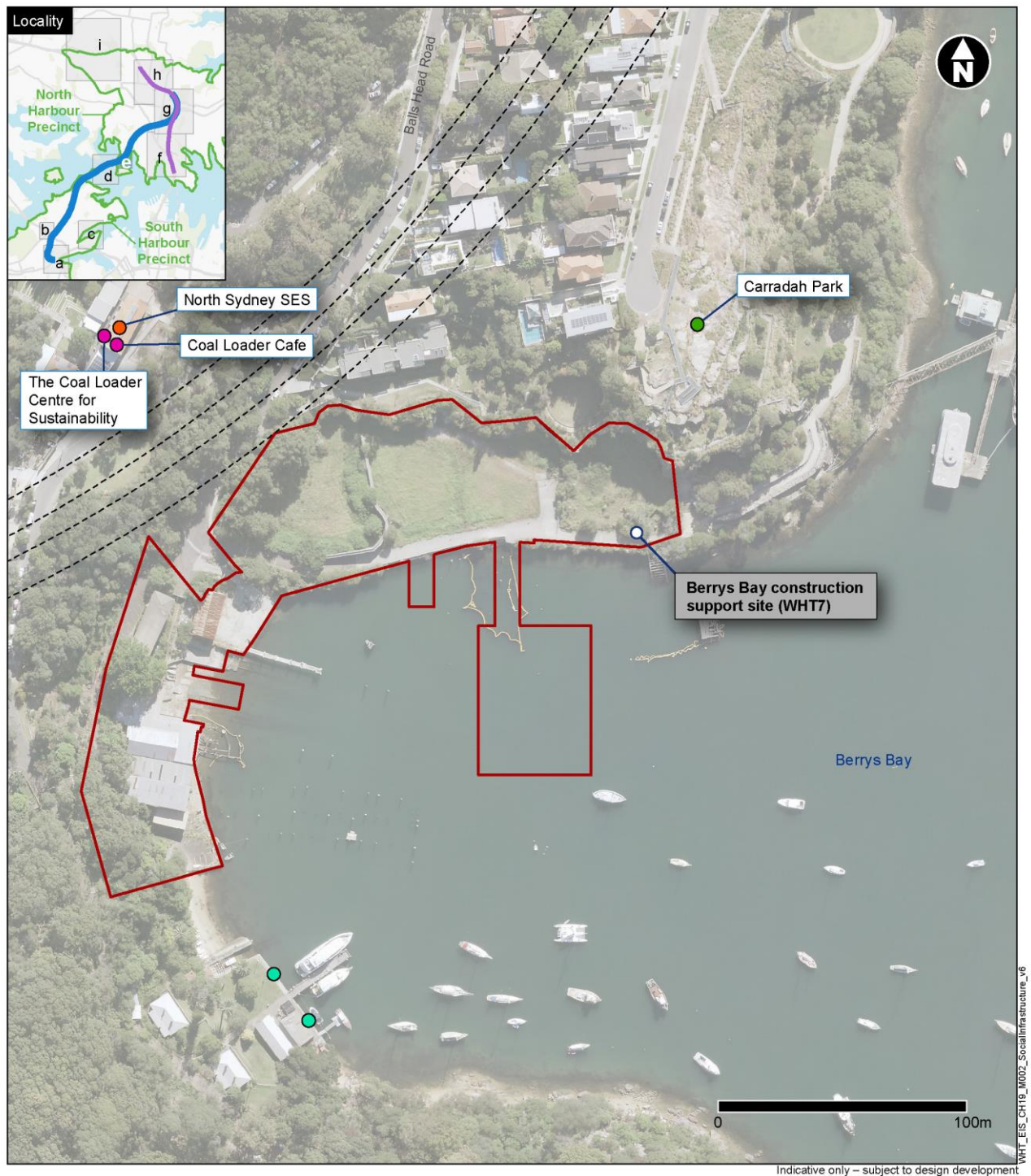
Construction features

- Tunnel section
- Construction footprint
- Construction support site

Social infrastructure

- Sport, recreation and leisure facilities
- Wharf

Figure 4-10d Social infrastructure near the project



Legend

Construction features

- Tunnel section
- Construction footprint
- Construction support site

Social infrastructure

- Community centre
- Sport, recreation and leisure facilities
- SES Facility
- Wharf

Figure 4-10e Social infrastructure near the project

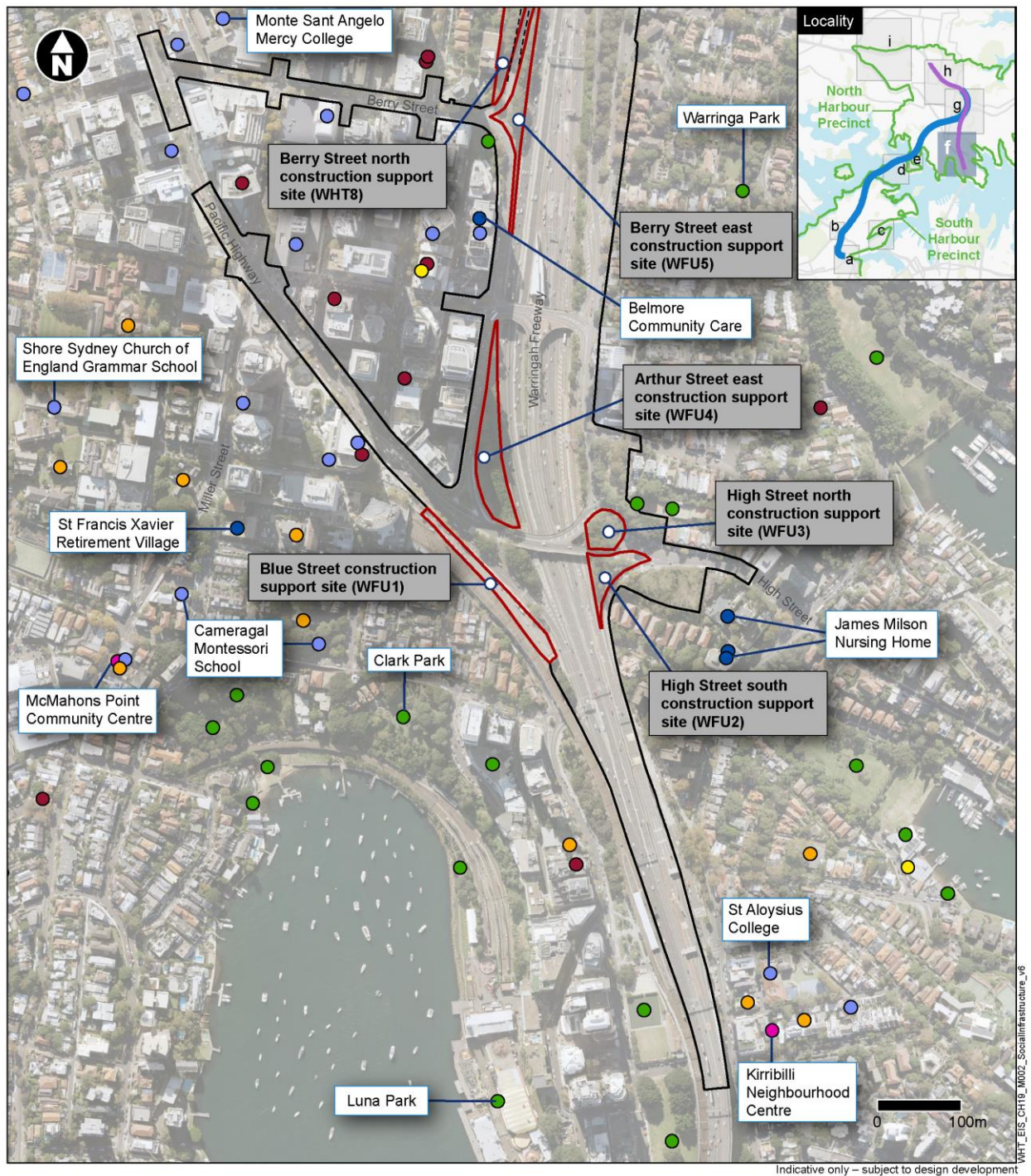


Figure 4-10f Social infrastructure near the project

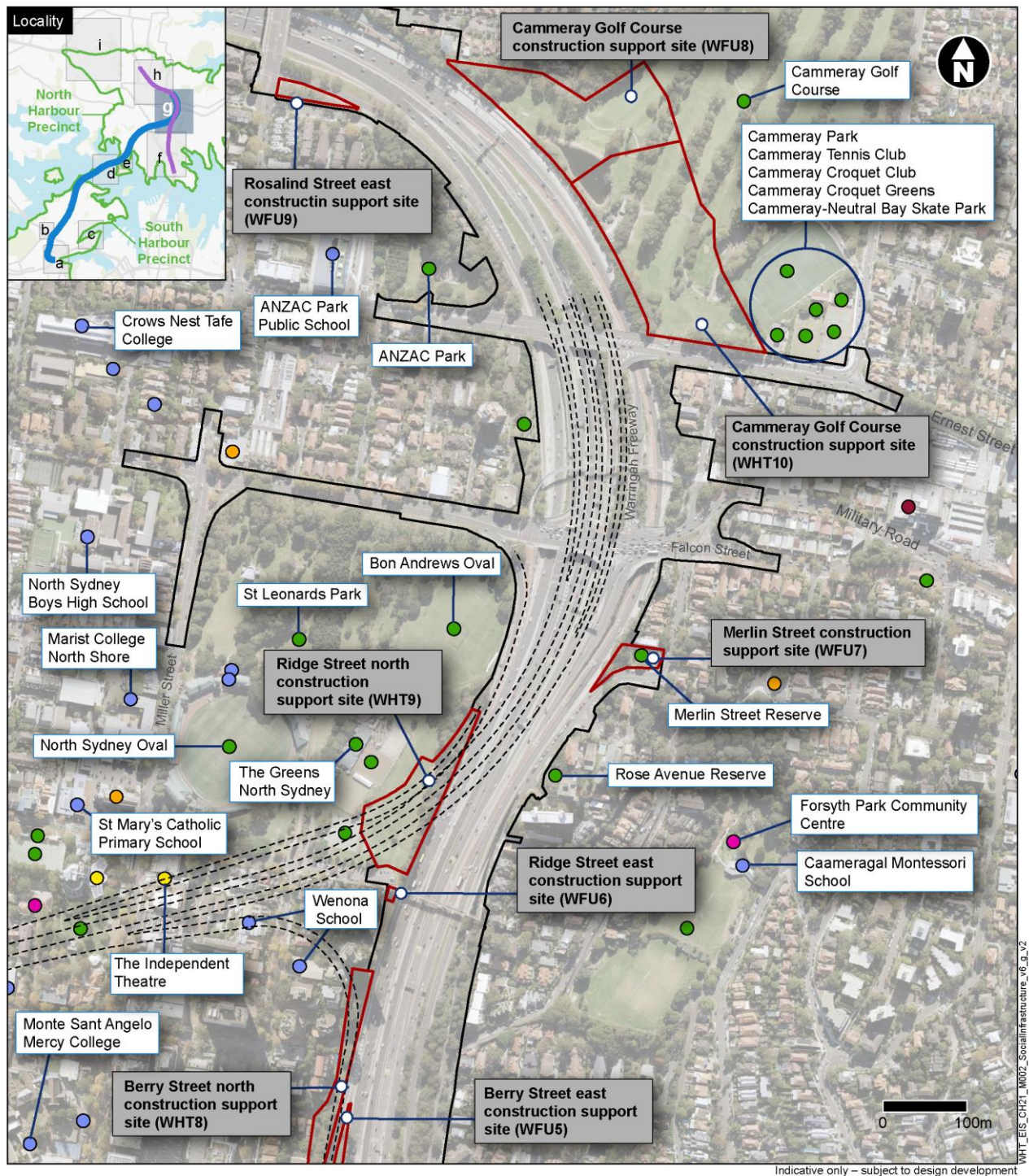
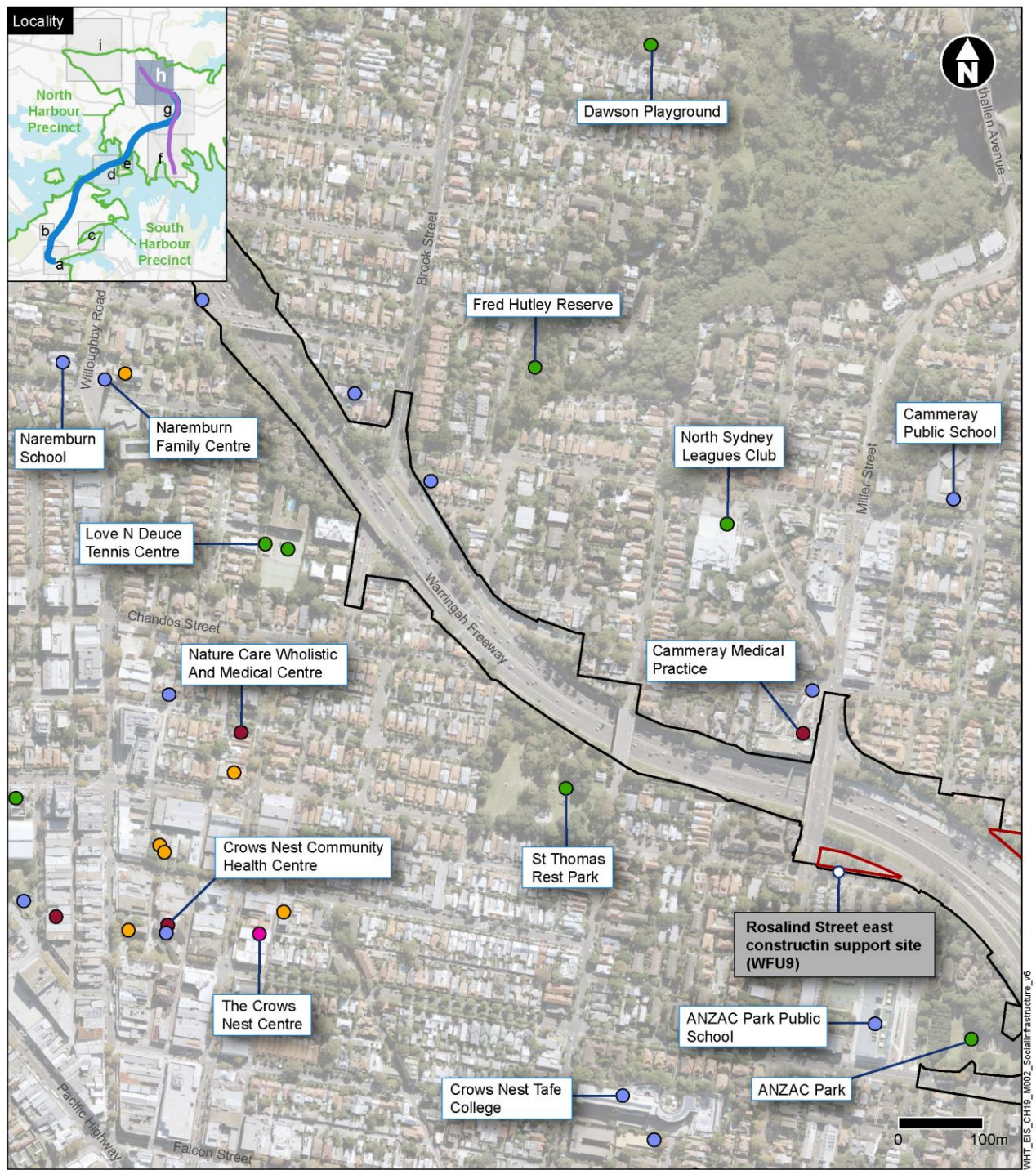


Figure 4-10g Social infrastructure near the project



Legend

Construction features

- Tunnel section
- Construction footprint
- Construction support site

Social infrastructure

- Community centre
- Library and performing arts
- Education and child care
- Health, medical and emergency services
- Places of worship
- Sport, recreation and leisure facilities

Figure 4-10h Social infrastructure near the project

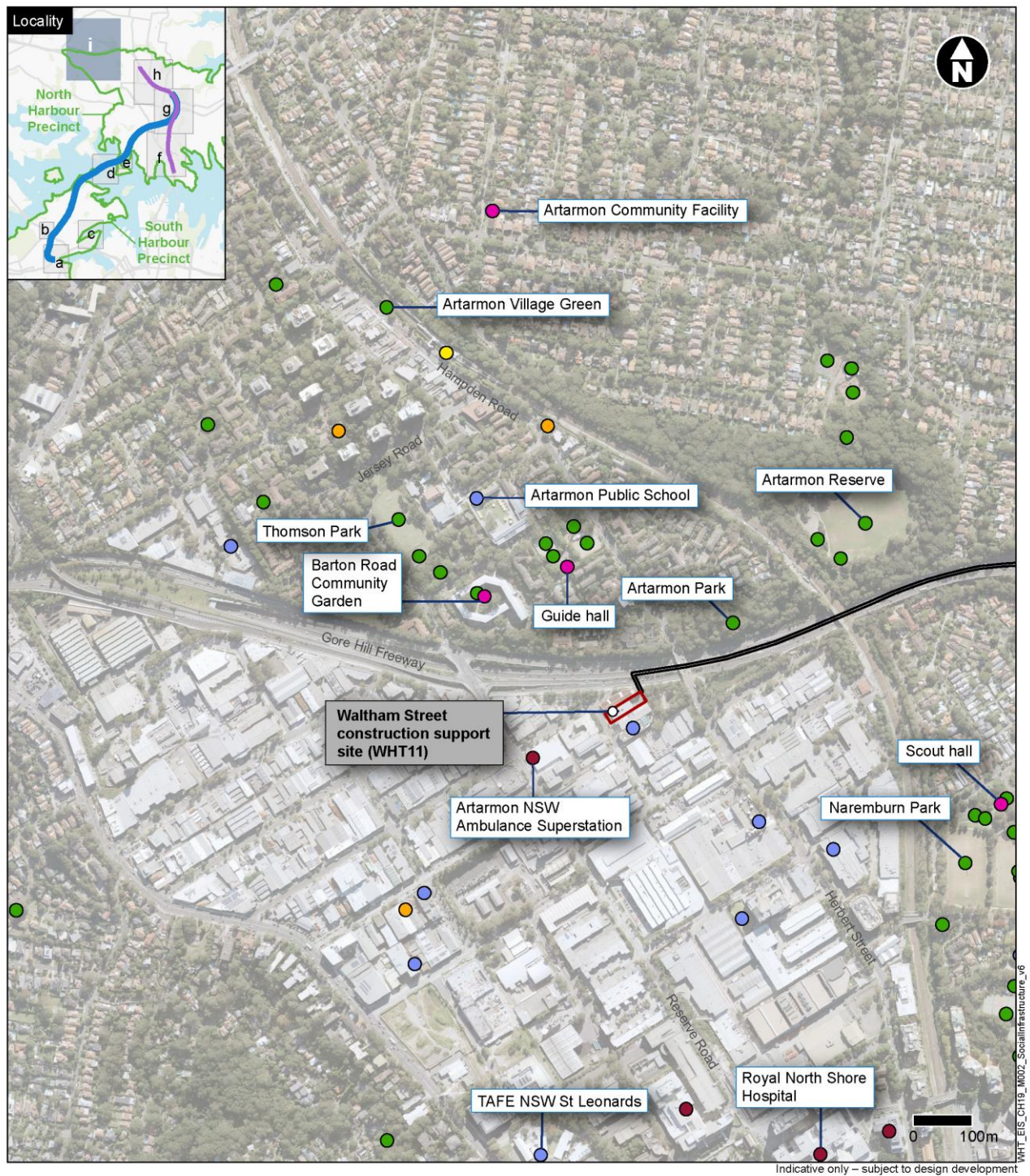


Figure 4-10i Social infrastructure near the project

4.4 Business profile

This section provides an overview of businesses in the study area. This has been informed by the business impact assessment prepared by HillPDA (2020), provided in Appendix A.

4.4.1 Local centres

The study area contains a diversity of centres ranging from local centres to larger strategic centres. Local centres are the focal point of neighbourhoods and generally meet the needs of local residents in relation to shopping and social interaction. They vary in size from a cluster of local shops to large-box format retail centres. Strategic centres are defined when the mix of activities, size and location enables the community access to a wide range of goods, services and jobs.

In the South Harbour Precinct, local centres comprise smaller retail centres such as Catherine Street and Victoria Road/Darling Street and more industrial oriented centres such as Roberts Street Industrial, James Craig Road and Chapman Road. In the North Harbour Precinct, North Sydney CBD and St Leonards strategic centre provide a mix of commercial, retail, health and education services. Along with the Artarmon Industrial centre, these centres are large generators of economic productivity and employment. The North Harbour Precinct also contains a number of local centres, with Miller Street, Cammeray, Kirribilli, Neutral Bay Junction, Military Road Cremorne, Bay Road Waverton and Crows Nest all being identified as being potentially affected by the project.

In 2016, the study area contained 29,236 businesses distributed across various local centres. The local centres contributing to businesses within each SA2 vary in size and scale, with North Sydney-Lavender Bay containing the greatest number of businesses. Some business centres are also within the precinct areas for the Beaches Link and Gore Hill Freeway project (HillPDA, 2020).

Table 4-11 provides a summary of business centres in the study area that may be impacted by the project. The study area also contains a wide variety of businesses located outside of business centres, which may also be impacted by the project's construction or operation. Further description of these businesses is provided in Appendix A.

Table 4-11 Summary of business centres in the study area

| Centre | General description |
|-------------------------------------|---|
| South Harbour Precinct | |
| Catherine Street Centre | The Catherine Street Centre contains two small business centres, including a larger convenience store located on the corner of City West Link and a small mixed-use retail centre containing a variety of small businesses. Businesses in the cluster cater to a neighbourhood catchment and are likely to be reliant on passing trade. |
| Victoria Road/Darling Street Centre | Businesses on Victoria Road comprise a variety of retail and personal medical services. Businesses at Darling Street include food retailing, a mix of clothing retailing and personal services, as well as a small number of commercial businesses (banks and post offices) and health services (gyms and medical centre). Darling Street would rely on passing trade and would service both a neighbourhood and wider catchment. The north-western end of the cluster contains a mix of business types including automotive, service station/convenience store and pub/hotel, which are likely to service both a neighbourhood and wider catchment and are more likely to be dependent on passing trade. |
| Robert Street Industrial Centre | The Robert Street Industrial Centre comprises industrial businesses including automotive, construction related retail and storage. Several commercial businesses are located north along Victoria Road to Darling Street. Businesses service both a neighbourhood and wider catchment and are unlikely to be dependent on passing trade. These businesses are destination services as many customers would drive specifically to the businesses. |
| James Craig Road Working Waterfront | This waterfront cluster comprises maritime related businesses, including dry storage, slipways, harbour cruises, government agency (Roads and Maritime), public marina berths as well as supportive food services |

| Centre | General description |
|---------------------------------|---|
| | <p>such as cafés. White Bay Cruise terminal is found at this centre. The terminal is also used as venue hire for private events. The Sydney Harbour Boat Storage, a dry stack boat storage, service, maintenance and fuel facility, is also located along James Craig Road Working Waterfront.</p> <p>At Glebe Island, the Port Authority of NSW is proposing to construct and operate of a multi-user facility for the import, storage and distribution of dry bulk materials such as sand and aggregates. There is also a proposal (yet to obtain planning approval) for the relocation of the Hanson Construction concrete batching plant to Glebe Island.</p> <p>The working waterfront would be dependent on access and connectivity, servicing a wide catchment. The business clusters are unlikely to be dependent on passing trade.</p> |
| Chapman Road Working Waterfront | This waterfront cluster comprises a number of maritime related businesses including boat hire, a multi-hull marina, charter boating and a slipway. The working waterfront would be dependent on access and connectivity, servicing a wide catchment. The business cluster is unlikely to be dependent on passing trade. |
| North Harbour Precinct | |
| Waverton Working Waterfront | This waterfront cluster comprises maritime businesses, including yacht charter companies and boat repair and storage facilities. Businesses located in the cluster are specialist businesses and do not rely on passing trade. |
| Miller Street Cammeray Centre | This cluster comprises a diverse mix of uses including a shopping centre, food and drink retailers, commercial businesses and neighbourhood shops. The cluster caters primarily to a neighbourhood catchment. However, as a major through road, businesses along Miller Street would also attract passing trade from residents of neighbouring suburbs. |
| North Sydney CBD | This centre comprises commercial offices and businesses, as well as food and drink retailers, gyms and fitness centres. The area surrounding North Sydney CBD comprises a wide range of uses including residential, community facilities and schools. Businesses in the area include commercial offices, food and drink retailers, sports clubs and accommodation services that service a neighbourhood catchment as well as those visiting for work. |
| Kirribilli Centre | Kirribilli Centre contains a school, church, various food and drink retailers and neighbourhood shops (for example, a florist, convenience store and post office). The cluster caters primarily to a neighbourhood catchment. |
| Bay Road Centre, Waverton | This cluster contains a church and a small number of neighbourhood businesses (for example, convenience store, chemist, butcher, restaurants and a café). The cluster caters primarily to a neighbourhood catchment. |
| St Leonards - Crows Nest Centre | This cluster comprises commercial offices and businesses (for example food and drink retailers as well as gyms and fitness centres). The area comprises a wide range of different uses including residential, community facilities and schools as well as various food and drink retailers and specialty stores. Most businesses in the area service a neighbourhood catchment as well as those visiting for work or a night out. The specialty businesses are destination stores as many customers would drive specifically to the businesses. |
| Military Road Cremorne Centre | This cluster comprises commercial offices, food and drink retailers, sports clubs and accommodation services. It includes a car dealership, medical centre and a mixed-use building. Businesses serve local residents as well as commuters and those visiting for work. The car dealership is a destination business while the medical centre services a neighbourhood catchment. Commercial businesses are not likely to rely on passing trade. |
| Neutral Bay Junction | This cluster comprises commercial offices, food and drink retailers, sports clubs and accommodation services. Businesses serve local residents as well as commuters and those visiting for work. Commercial businesses are not likely to rely on passing trade. |
| Artarmon Industrial Centre | This industrial centre comprises automotive businesses (for example vehicle sales, rental and repair), film related businesses as well as construction related commercial businesses (such as equipment sale and hire). It includes a gym and fitness facilities, warehouse/storage facilities and commercial businesses. Businesses in the area service both a neighbourhood and wider catchment and are unlikely to be dependent on passing trade. |

Source: Based on Western Harbour Tunnel and Warringah Freeway Upgrade, Business Impact Assessment (HillPD, 2020). Refer to Appendix A for further details.

4.4.2 Maritime businesses

A range of businesses are located within or near to the study area that are reliant on Sydney Harbour for their operation. These include:

- Ports, including dry bulk imports, general cargo, fuel facility, oil tankers
- Transport services such as public ferries, private ferries and water taxis
- Navy bases, providing defence and training facilities
- Maritime facilities, such as boat moorings, boat licensing, marine rescue, boat maintenance and repairs, tow boats, and marina facilities
- Tourism businesses, including cruise ships, harbour cruises, outdoor recreation and sporting activity operators and hire facilities, recreational boat hire, Sydney Fish Market, and seaplane operations
- Commercial operations, such as commercial fishing operators (commercial fishing is not allowed in the harbour; however, boats travel in the harbour to moor and distribute catch), charter boats, science and research, and refuelling.

Sydney Harbour is also a leading cruise ship destination and the only port in Australia with two dedicated cruise terminals, one at White Bay and one at Circular Quay. In 2018, the Overseas Passenger Terminal at Circular Quay had more than 230 cruise ship movements while White Bay Cruise Terminal at Balmain had 120 cruise ship movements. Moorings are also available for commercial use throughout Sydney Harbour (HillPDA, 2020).

4.4.3 Business perceptions

Business surveys were conducted by HillPDA for the business impact assessment to understand how businesses near the project currently operate and potential issues, perceptions and concerns of businesses relating to the project's construction and operation. The following provides a summary of key findings from the business surveys (HillPDA, 2020).

The results of the business survey indicated that businesses in the area have varying degrees of sensitivity to project construction and operational aspects. Businesses reported a high perceived dependency (75 per cent) on vehicular passing trade, with 43 per cent of businesses surveyed indicating they were 'majorly dependent' on passing trade. Eighty-four per cent of surveyed businesses perceived a dependency on pedestrian and cyclist passing trade, with 66 per cent of these reporting to be 'majorly dependent'.

Changes in access to a centre, for example through congestion and changes in travel times, may result in long-term changes to consumer and worker behaviour. The business survey found that eighty per cent of businesses perceived that they were sensitive to travel time delays, with 45 per cent of survey respondents perceived to be 'majorly sensitive'.

Businesses surveyed indicated the majority of their customers and employees use private vehicles as their primary transport mode. Convenient customer parking was considered a dependency by 74 per cent of businesses surveyed with 54 per cent of respondents indicating a 'major dependency' on convenient customer parking. The majority of businesses (84 per cent) perceived a dependency on on-street parking, with 63 per cent of these businesses recording a major dependency.

Changes to local character and amenity could potentially affect the enjoyment and desirability of the environment, visitor numbers and trends, and consequently the economic activity of a commercial centre and the businesses located there. Overall, 80 per cent of businesses surveyed identified that they were dependent on the identity and character of the commercial centre they were located in, with 43 per cent reporting to be 'majorly dependent'. Sixty-five per cent identified that they were dependent on a pleasant visual amenity, 18 per cent had a high sensitivity to noise, 39 per cent had a high sensitivity to air quality and 37 per cent had a high sensitivity to odour.

Further detail on businesses in the study area is provided in Appendix A.

4.5 Community values

This section provides an overview of those values or features within the study area that are likely to be important to local and regional communities. This has been informed by the review of existing literature such as Council planning and strategy documents; assessment of places likely to be important to community members such as open space, heritage places and recreation facilities; review of community and stakeholder engagement outcomes; and observations of the study area.

4.5.1 Local amenity and character

Community values relating to local amenity and character refer to natural and physical qualities and characteristics that contribute to a person's appreciation of their surroundings. They relate to such things as built form and landscape, environmental conditions (that is, noise levels and existing air quality), and heritage and cultural features.

Local amenity and character in the study area is generally characterised by a diversity of land and waterway uses including:

- Industrial and maritime uses at Rozelle Bay and White Bay, including port facilities, such as the White Bay Cruise Terminal and Glebe Island
- Residential neighbourhoods within the South Harbour Precinct, such as at Lilyfield, Balmain, Rozelle and Birchgrove
- Pockets of high-density residential areas within the North Harbour Precinct, such as at McMahon's Point, Waverton, Wollstonecraft, North Sydney and Cammeray
- Local centres and shopping precincts within both precincts, including at Rozelle, Balmain, St Leonards and Crows Nest, as well as a major commercial centre at North Sydney
- Recreational facilities, such as Cammeray Golf Course and St Leonards Park
- Major community facilities such as hospitals (including the Balmain Hospital, Royal North Shore Hospital and North Shore Private Hospital), educational uses (such as the University of Tasmania Campus at Rozelle) and cultural facilities (such as places of worship, community centres and libraries).

The study area includes a number of open space areas, reserves and parks that are valued by local and regional communities for their landscape amenity, heritage and recreational values. These include:

- South Harbour Precinct:
 - Yurulbin Park, located at the end of Louisa Road, Birchgrove
 - Birchgrove Park, located at The Terrace, Birchgrove
 - Callan Park, located at Wharf Road, Lilyfield
- North Harbour Precinct:
 - St Leonards Park, located at Miller Street, North Sydney
 - ANZAC Park, located on the corner of ANZAC Avenue and Ernest Street, Cammeray
 - Balls Head Reserve, located at Balls Head Drive, Waverton
 - Waverton Park, located at Woolcott Street, Waverton.

The North Sydney Community Plan highlights St Leonards Park as a major feature within the North Sydney local government area. St Leonards Park is identified as an important area of open space and recreation due to the provision of active and passive recreational opportunities and heritage significance (North Sydney Council, 2013). Consultation carried out as part of the development of the St Leonards Park Masterplan in

2017 identified the park to be an important place for walking, relaxing and for children to play (Cred Consulting, 2017). The consultation also identified green open space, trees and greenery and quietness to be important values of St Leonards Park to the local community. The final St Leonards Park Landscape Masterplan was released by North Sydney Council in June 2018 following consultation on the draft masterplan in February 2018.

Community and stakeholder engagement for the project identified the need to protect and preserve public open space areas, including Birchgrove Oval, Yurulbin Park, St Leonards Park and ANZAC Park. Community feedback also indicated that open space is limited within the Inner West local government area and identified Birchgrove Oval as being highly valued as a sport and recreation facility.

Sydney Harbour contributes significantly to the amenity and character of the study area. The Harbour is of national and international importance, and is highly valued for its natural and environmental assets; historical and cultural associations; landscape amenity; sporting, recreation and leisure activities; transport and trade functions; and tourism and economic activities (Hoisington, 2015). The Sydney Harbour Landscape Area is listed on the Register of the National Estate for its *“great diversity of colourful marine scenery, providing a magnificent setting for many nautical occasions, royal visits, yachting and boating spectacles. The harbour boasts a rich Aboriginal and European heritage. It is the leading port of the Commonwealth and the centre of a great variety of marine activity, tourism and recreation”* (Department of the Environment and Energy, undated).

Sydney Harbour is also valued for its contribution to tourism and as a setting for major community events and activities. Over the year ending March 2018, about 4.6 million overnight visitors visited Darling Harbour, including 2.5 million international visitors. Key activities for tourists included eating out and sightseeing (Destination NSW, 2018). A large number of major events are held on Sydney Harbour each year, including the Sydney New Years’ Eve fireworks, Australia Day celebrations (including the Ferryathon, Australia Day Harbour Parade and Tall Ships Race), Sydney to Hobart yacht race, Chinese New Year celebrations (including Dragon Boat racing) and Vivid Sydney. Sydney Harbour is used for informal and formal recreational opportunities, such as recreational boating, fishing, sailing, rowing and kayaking. Public open spaces near the project also provide views of Sydney Harbour, such as Yurulbin Park, Birchgrove Park and Balls Head Reserve.

The study area includes numerous places and buildings of national, state and local heritage significance that are highly valued by communities. Sydney Harbour has a range of heritage places including the world heritage listed Cockatoo Island and Sydney Opera House, in addition to the Commonwealth heritage listed Snapper Island, Spectacle Island Explosives Complex, Woolwich Dock, Admiralty House Garden and Fortifications at Kirribilli and Garden Island. The Sydney Harbour Bridge is also listed as having national heritage significance on the National Heritage List. Heritage and history associated with Aboriginal culture as well as early European settlement also contributes to the character and identity of communities within the study area. Heritage assets also provide points of interest for residents and tourists (North Sydney Council, 2013).

Yurulbin Park has important local heritage values associated with its historic, aesthetic and social significance as part of the area’s early development and use as a public waterfront park (NSW Office of Environment and Heritage, 2018). The former coal loader at Ball Head Drive at Waverton is of local heritage significance and is listed in the North Sydney Local Environmental Plan 2013. The coal loader includes a Centre for Sustainability, community garden, nursery, and provides guided tours and the opportunity for community volunteering. St Leonards Park is of state heritage significance as one of the earliest established public parks in NSW and contains one of Australia’s oldest, continuously used cricket grounds and bowling clubs. The original park layout remains largely intact apart from a section that was acquired in the 1960s for the construction of the Warringah Expressway (NSW Office of Environment and Heritage, 2018). Protecting heritage values were identified by community members during community consultation for the project as being important. In particular, community members identified that heritage values associated with ANZAC Park and Birchgrove Oval should be protected. Further information on heritage values in the study area is presented in *Technical working paper: Non-Aboriginal heritage impact assessment* (Jacobs, 2020).

4.5.2 Community cohesion

Community cohesion refers to the connections and relationships between individuals, groups and neighbourhoods. It is encouraged by the existence of local community facilities, a sense of local identity and opportunities for community participation. Overall, levels of community cohesion and sense of belonging in the study area are expected to be good, with communities having access to a diverse range of local and regional level community facilities, strong support networks and a variety of meeting places such as local centres, community centres, sporting clubs and cafes.

Community and social networks in the study area are associated with social infrastructure, such as schools, churches, sporting clubs such as Cammeray Golf Club and North Sydney Bowling Club, and community, heritage and resident groups. Many of these community and social networks are long-standing and are supported by contributions from volunteers, which further strengthen community cohesion.

Communities in the study area host a variety of local events and programs which provide opportunities for residents to connect with and participate in community life, helping to foster a sense of community and local identity. These include:

- Festivals, such as Willoughby Spring Festival and North Sydney Children's Festival
- Cultural and sporting events, such as the Bay Run at Leichhardt, Classics at Callan Park (classical music), Balls Head Reserve Wellness Walk, Guringai Festival, Big Bash cricket, Twilight Food Festival and Spring into Jazz at North Sydney
- Community volunteering programs, such as the former coal loader and the Balls Head Reserve Bushcare Group
- Local markets, including at Rozelle, Crows Nest, Kirribilli and North Sydney.

Road corridors such as the existing Warringah Freeway create barriers, both real and perceived, to local movement and connectivity within the study area and form boundaries to neighbourhoods, pedestrian and cycle movements and to some local centres. This may influence some people's ability or desire to move through the study area, impacting on their access to services, meeting places, and participation in social networks.

4.5.3 Community health and safety

Maintaining a high level of community safety and ensuring people feel safe in public places is important to communities in the study area. Concerns about road safety and safety impacts associated with locating construction works or operational infrastructure near local streets and social infrastructure raised during community and stakeholder engagement for the project. Potential air quality issues from operation of the project and concerns around potential impacts for local communities, schools and park users near tunnel portals and ventilation facilities were also raised during engagement for the project. In particular, community concerns related to the location of the tunnel portals and ventilation facilities and potential air quality impacts for school students and users of open space areas.

4.6 Access and connectivity

The study area is serviced by several major transport facilities that provide a high level of access and connectivity within the study area, to the wider Sydney area and regional NSW. These include roads, rail services, bus services, ferry and maritime services and active transport. The following provides a summary of key transport networks, services and facilities in the study area. Further information is also provided in *Technical working paper: Traffic and transport* (Jacobs, 2019b).

4.6.1 Roads

Major roads provide access to destinations within the study area and access for communities to the Greater Sydney region. Existing major roads near the project include:

- City West Link, which passes through the study area at Rozelle, providing access within the Inner West local government area and to Sydney Olympic Park, Parramatta, Blacktown, Penrith and the Blue Mountains (via the M4 Motorway)
- Victoria Road, which passes through the study area at Rozelle, providing access to Parramatta and Sydney's North Shore
- Western Distributor, which provides access from Rozelle (City West Link and Victoria Road) to the Sydney CBD, North Sydney and beyond
- James Craig Road/Sommerville Road, which connects to the White Bay Cruise Terminal and other maritime-related land uses in Rozelle Bay, Glebe Island and White Bay
- Darling Street, which connects Rozelle and Balmain town centres
- Warringah Freeway, which provides access to and from local centres at Naremburn, Cammeray, St Leonards and North Sydney and provides regional access from the Northern suburbs of Sydney to the Sydney CBD, Eastern suburbs (via the Sydney Harbour Tunnel and Cahill Expressway) and Western suburbs (via the Western Distributor)
- Pacific Highway, which passes through St Leonards, Crows Nest and North Sydney
- Falcon Street/A8 Military Road, which connects Crows Nest, Mosman and the Northern Beaches.

As indicated in Section 4.5.2, major road corridors within the study area create existing or perceived barriers to local movement and connectivity.

4.6.2 Public transport

Rail services

Passenger rail services in the study area include both metropolitan services operated by Sydney Trains, as well as regional and interstate services operated by NSW Trains. Railway stations are located near the project at Milsons Point, North Sydney, Waverton, Wollstonecraft and St Leonards. The study area is also serviced by the Dulwich Hill Light Rail, which provides connections from Central to Dulwich Hill. Light rail stations located near the project include Rozelle Bay and Lilyfield stations.

The Sydney Metro City & Southwest is a standalone rail network, comprising Sydney Metro Northwest and Sydney Metro City & Southwest. Construction has started on the Chatswood to Sydenham component of Sydney Metro City & Southwest project. Metro stations located near the project would include stations at Victoria Cross in North Sydney, Crows Nest and Chatswood.

Bus services

The study area includes numerous bus corridors that use major roads such as:

- Victoria Road and ANZAC Bridge – for services to Sydney CBD, the Inner West, Ryde, Macquarie Park and Parramatta
- Warringah Freeway – for services to Sydney CBD, Northern Beaches, North Shore and the Hills District
- Military Road – for services to Mosman and the Northern Beaches
- Pacific Highway – for services to Chatswood, Epping, Gladesville and the Hills District.

A number of bus stops are located near the project. Main bus stops located near surface works include:

- Bus stops located along The Crescent at Rozelle, near the proposed Rozelle Rail Yards construction support site (WHT1)
- Bus stops located along Victoria Road at Rozelle (including at Moodie Street, Wellington Street and Darling Street), near the proposed Victoria Road construction support site (WHT2)

- A number of bus stops located on roads nearby proposed surface works (as part of the Warringah Freeway Upgrade component), including along the Pacific Highway, Falcon Street, Ernest Street and Miller Street.

Ferry services

Ferry services are provided from wharves located in Balmain, Balmain East and Birchgrove. These wharves are served by the F3 Parramatta River line operated by Sydney Ferries, providing direct connections to Circular Quay, Barangaroo and locations along the Parramatta River. Balmain East wharf is also served by the F4 Cross Harbour line that provides direct connections to Circular Quay, Barangaroo, Milsons Point, Pyrmont Bay, Rose Bay and Watsons Bay. Cockatoo Island is serviced by the F8 Cockatoo Island line which provides direct connections to Woolwich, Greenwich Point, Balmain and Circular Quay.

At the time of the 2016 Census, about 2622 people living in the study area used the ferry for all or part of their journey to work. This represented 2.9 per cent of people aged 15 years or over and was above the Greater Sydney region average, at 0.5 per cent. Within the study area, Balmain had the highest proportion of people who used the ferry for their journey to work, at 10.6 per cent, followed by Mosman (5.3 per cent) and Neutral Bay-Kirribilli (5.2 per cent).

4.6.3 Maritime

Sydney Harbour provides access for a range of maritime functions for both businesses and communities. White Bay Cruise Terminal is a dedicated passenger terminal located at White Bay at Rozelle. The White Bay Cruise Terminal is one of two dedicated cruise passenger terminals in Sydney Harbour, the second being the Overseas Passenger Terminal at Circular Quay. The terminals received a combined total of 350 cruise ship movements in 2018 (refer to Section 4.4.2). Vehicle access to the White Bay Cruise Terminal is via James Craig Road.

A number of marina boatsheds and/or boat hire businesses providing access to Sydney Harbour are located at Rozelle Bay. Marina boatsheds and/or boat hire are also located at Berrys Bay. Launching areas that provide access for recreational users such as kayakers, nearest to the project are located at Lavender Bay. Private moorings and jetties are located near the project at Snails Bay, along Louisa Road in Birchgrove, Berrys Bay and close to Balls Head. Consultation with marine stakeholders is discussed in Chapter 7 (Stakeholder and community engagement) of the environmental impact statement.

Further information on transport use of Sydney Harbour is provided in Chapter 8 (Construction traffic and transport) of the environmental impact statement.

4.6.4 Active transport

Walking and cycling is an important mode of transport for residents, workers and visitors in the study area. Pedestrian and cycle paths in the study area comprise separated off-road, dedicated cycleways and dedicated, on-road cycling lanes.

Within the South Harbour Precinct, significant pedestrian activity is associated with the Rozelle and Balmain town centres at Victoria Road and Darling Street. Two shared user path bridges span Victoria Road, including one about 90 metres north of The Crescent and the other about 70 metres east of The Crescent. North of Sydney Harbour, significant pedestrian activity is associated with retail and commercial land uses at North Sydney CBD, and near schools located west of the Pacific Highway and along Miller Street. Balls Head Reserve also attracts significant recreational pedestrian activity.

The Warringah Freeway currently presents a barrier to east–west pedestrian and cycle movements, with crossing of the freeway limited to crossings at:

- Merrenburn Avenue at Naremburn
- Brook Street at Naremburn

- West Street at Cammeray
- Miller Street at Cammeray
- Ernest Street at Cammeray
- Shared user path bridge connecting Falcon Street in North Sydney and Merlin Street in Neutral Bay
- Falcon Street at North Sydney
- Shared user path bridge connecting Ridge Street in North Sydney and Alfred Street North in Neutral Bay
- Mount Street at North Sydney
- High Street at North Sydney.

The regional strategic cycle network provides connections between the study area and Sydney CBD, Redfern, Green Square, Sydney Airport, Pyrmont, Surry Hills, Haberfield, Summer Hill, Lane Cove and Macquarie Park. Off-road shared user paths are provided at:

- Victoria Road between The Crescent at Rozelle and Drummoyne
- ANZAC Bridge at Pyrmont
- Along the foreshores of Iron Cove, Rozelle Bay and Blackwattle Bay
- Along the southern side of the Gore Hill Freeway at Artarmon.

As indicated in Section 4.5.1, Sydney Harbour is used for informal and formal recreational opportunities, such as rowing and kayaking.

5. Issues raised during engagement

This assessment has been informed by the outcomes of community and stakeholder engagement for the project. This section provides a summary of the key socio-economic issues raised by the community and stakeholders.

Information from community and stakeholder engagement for the project identified a range of views relating to the socio-economic effects of the project's construction and operation, including both positive and negative impacts. More detailed information on the engagement process, including stakeholders consulted and key issues raised, is provided in Chapter 7 (Stakeholder and community engagement) of the environmental impact statement.

Table 5-1 summarises the topics for which feedback was received from government agencies, local government and the community.

Table 5-1 Summary of feedback from stakeholders and the community

| Topic | Summary of feedback |
|---------------------------|---|
| Air quality | <ul style="list-style-type: none"> Air quality impacts, location and operation of tunnel ventilation system, impacts on health. |
| Visual amenity | <ul style="list-style-type: none"> Impacts to visual amenity, visual impacts of temporary/permanent structures, and overshadowing. |
| Socio-economic | <ul style="list-style-type: none"> Impact on community amenity during construction/operation and neighbourhood character. |
| Aboriginal heritage | <ul style="list-style-type: none"> Impacts to Aboriginal heritage. |
| Noise and vibration | <ul style="list-style-type: none"> Noise impacts, including construction noise, cumulative noise impacts, road traffic noise changes and noise walls. |
| Design | <ul style="list-style-type: none"> Tunnel entry and exit portals, alignment, road connections and suggested design changes such as moving portals. |
| Traffic and transport | <ul style="list-style-type: none"> Transport mode, including public transport alternatives, network integration, and integration with other key projects Congestion, road network performance, local road connections, increased traffic, and cumulative impacts Integration with other approved and proposed infrastructure (for example, Northern Beaches B-Line, Sydney Metro City & Southwest) Potential impact on local streets, including rat running, local road safety, construction traffic and on parking spaces Cycling, cycleway facilities, active transport. |
| Property impacts | <ul style="list-style-type: none"> Potential property impacts on directly and indirectly impacted properties, including property value. |
| Biodiversity | <ul style="list-style-type: none"> Impacts on fauna, flora, vegetation and National Parks Need for land bridges. |
| Construction | <ul style="list-style-type: none"> Construction impacts, including location of construction sites, temporary impacts to support construction, hours of work, and night works Potential health risks associated with previous use of sites. |
| Other project information | <ul style="list-style-type: none"> Project cost and tolling Project timing. |

6. Impact assessment

This section assesses potential impacts on socio-economic values in the study area from the construction and operation of the project.

6.1 Property impacts

This section describes impacts on property from the construction and operation of the project. Further detail about property acquisition is provided in Chapter 20 (Land use and property) of the environmental impact statement for the project.

6.1.1 Property acquisition and temporary leases

Based on the current project design, an estimated 28 properties would be acquired or temporarily leased for the project. Land owned by Roads and Maritime would also be used for construction and operation of the project.

Twenty properties would be fully acquired for the project, including one commercial property, sixteen residential properties, two properties comprising vacant land and one property comprising kerbside land adjacent to Rose Avenue Reserve. Four properties would be partially acquired for the project, including land owned by the NSW Government and privately-owned land. This includes:

- One commercial property
- One residential property
- Two properties accommodating social infrastructure, including Cammeray Golf Course and St Leonards Park. Further design development may avoid the need for permanent acquisition of land from St Leonards Park.

The project would also require substratum acquisition of privately-owned residential lots. Substratum acquisition involves the below ground acquisition of an 'envelope' around the tunnels. Further details regarding substratum acquisition is provided in Chapter 20 (Land use and property) of the environmental impact statement.

Properties required for the project would be acquired by Roads and Maritime in accordance with the provisions of the *Property Acquisition (Just Terms Compensation) Act 1991* and the Land Acquisition Reform 2016 process. Among other things, the *NSW Property Acquisition (Just Terms Compensation) Act 1991* provides the basis for assessing compensation. Roads and Maritime has started consultation with affected property owners about the acquisition process and potential adjustments required to properties. Consultation will continue through project development.

Temporary leases of land would be required for construction support sites and other construction works. This includes:

- Land used for industrial and commercial uses at White Bay
- Three properties accommodating social infrastructure, including land used for open space and sporting uses at Yurulbin Park, St Leonards Park, and Cammeray Golf Course.

Land owned by Roads and Maritime accommodating social infrastructure would also be temporarily or permanently impacted by the project, including at Jeaffreson Jackson Reserve, Rose Avenue Reserve, Alfred Street North Park and Merlin Street Reserve. Potential impacts on social infrastructure from property acquisition is described in Section 6.6.

After construction, land used for construction works but not required for the ongoing operation of the project, would be rehabilitated and reinstated to its existing use and/or returned to the landowner.

Table 6-1 summarises details of lots impacted by the project's construction and operation. Figures showing the location of these lots are provided in Chapter 20 (Land use and property) of the environmental impact statement.

Table 6-1: Summary of affected properties

| Lot/ DP number | Owner | Existing land use | Total approximate area of affected lot(s) | Approximate proportion of lot(s) used for construction (%) | Approximate proportion of lot(s) used for operation (%) |
|---|------------------------|--------------------------------------|---|--|---|
| 22/DP421 | Private | Residential | 290 | 100% | 0% |
| SP67362, A/DP436153, B/DP436153, 2/DP323480 | Private | Vacant (Rozelle Village) | 880 | 100% | 0% |
| 36/DP190866, 37/DP421, 1/DP109047, 1/DP528045, 38/DP421, 101/DP629133, 102/DP629133, 104/DP733658 | Private | Vacant (former Balmain Leagues Club) | 7340 | 100% | 0% |
| 2/DP879549, 10/DP1170710, 4/DP875201 | State of NSW | Glebe Island | 363,900 | 21% | 0% |
| 2/DP179069, 4/DP179069, 1/9/DP192096, 1/DP1112881, 6/DP179069 | Department of Planning | Yurulbin Park | 4610 | 100% | 0% |
| B/DP334161 | Private | Commercial | 1300 | 100% | 100% |
| 102/DP1162896, 21/DP1048933 | Government Property | Balls Head | 12,590 | 100% | 0% |
| 1/DP220909, 2/DP220909 | Private | Commercial (garden bed) | 230 | 100% | 60% |
| 7321/DP1149783, 1106/DP46990 | State of NSW | St Leonards Park | 108,380 | <10% | <1% |
| 2/DP222370 | Private | Residential | 390 | 100% | 0% |
| B/DP322941 | Private | Residential | 420 | 100% | 0% |
| | State of NSW | ANZAC Park | 16,670 | <10% | 0% |
| SP32423 | Private | Residential (multi-unit) | 820 | 100% | <10% |
| 7302/DP1136001, 7303/DP1136001, 2/DP244543, 3/DP244543, 4/DP244543, 5/DP244543, 6/DP244543 | State of NSW | Cammeray Golf Course | 147,350 | 30% | 17% |
| 26/DP250372 | Council | Kerbside (Rose Avenue Reserve) | 210 | 24% | 24% |
| A/DP933263 | Private | Residential | 450 | <10% | <10% |

6.1.2 Impact of property acquisition

Property acquisition for the project would involve both partial and full acquisition of properties, impacting residential uses, commercial uses and social infrastructure.

Sixteen residential properties would be fully acquired for the project. Occupants of these properties would need to permanently relocate prior to construction. One residential property would be subject to permanent

partial acquisition for the project. This would not require the occupants of this property to permanently relocate. During construction, some occupants of residential properties may be required to temporarily relocate due to amenity impacts. This would be considered in consultation with affected residents as required. Further discussion about potential impacts on community cohesion is provided in Section 6.7.

Some residents and communities near the project may experience a level of stress and anxiety due to uncertainty about potential property impacts (both surface and substratum), property acquisition and proposed changes from the project, potentially impacting the health and wellbeing of some individuals. Some individuals impacted by acquisition of residential properties may also experience impacts on health and wellbeing associated with disruptions to social networks and personal relationships associated with their permanent or temporary relocation or relocation of neighbours. These impacts are likely to have the greatest effect on groups such as elderly, people with a disability, longer term residents and people on lower incomes, who are often more reliant on personal and community networks.

Concerns about potential property impacts and property acquisition were raised by community members during consultation for the project. Roads and Maritime has started consultation with affected property owners and will continue to engage with property owners and other affected stakeholders about specific property impacts, including the acquisition and compensation process. Further discussion about the property acquisition process is provided in Chapter 20 (Land use and property) of the environmental impact statement.

The sensitivity of affected individuals and households are considered to be high, while the magnitude of the change is considered to be low given the small number of affected residential properties, relative to residential properties in the vicinity of the project. As a result, the overall significance of potential impacts from the acquisition of residential properties is considered moderate (refer to Table 6-7).

6.1.3 Other property impacts

The mainline tunnels would pass beneath a large number of properties, including residential uses, commercial and industrial uses, and social infrastructure. Potential impacts of tunnels on the use of properties and future development potential was raised during community engagement for the project. Under the *Property Acquisition (Just Terms Compensation) Act 1991*, compensation is generally not payable for acquisition of land under the surface unless the surface of the overlying soil is disturbed, or the support of that surface is destroyed or affected by construction of the tunnel.

Potential impacts on future development above tunnels generally only occur in locations where the tunnel depth is shallow, for example close to portals. Any limitations on future development of properties above the tunnel would only affect a very small number of properties. For most properties along the alignment, the location of the tunnels beneath properties is not expected to impact on the future use or development of properties at the surface and subject to council regulations and approvals, landowners would generally be able to:

- Carry out improvements, such as installing a swimming pool
- Dig deeper foundations for a new building or second storey additions.

The overall significance of potential impacts on future development of properties directly above the tunnel is considered negligible, with the sensitivity of affected properties considered to be moderate, while the magnitude of the change is considered to be negligible given that the potential for impact is expected to be minor and any potential impacts would mainly be to a very small number of properties close to the portals (refer to Table 6-7).

Concerns were raised during community and stakeholder engagement about the potential for property damage, including to basement car parks, unit developments and pools, due to vibration from tunnelling activities. During construction, some properties located near construction worksites or above or near the tunnel alignment may experience short-term vibration and ground-borne noise impacts due to the use of equipment such as rock hammers and roadheaders. For most properties, vibration levels are predicted to be below levels that may cause potential risk to buildings or structures, including minor cracking. However, there

is potential risk for cosmetic damage to a small number of properties, particularly more sensitive heritage buildings, closest to vibration intensive construction activities (eg activities using large rock hammers).

The excavation of tunnels may also result in settlement of the ground surface at some locations. This may cause very slight to slight cosmetic damage to some buildings above or near the project, although is not expected to impact on the stability of buildings. Building condition surveys and monitoring would be conducted to help manage potential vibration and settlement impacts. Further discussion about potential vibration and settlement impacts on buildings and structures, along with further recommended measures to manage potential impacts, is provided in Chapter 16 (Geology, soils and groundwater) of the environmental impact statement and *Technical working paper: Noise and vibration* (Renzo Tonin & Associates, 2020). Potential amenity impacts of construction are discussed in Section 6.7.1. The overall significance of potential damage to properties above the tunnel during construction is considered low, with the sensitivity of affected properties and magnitude of change considered to be low (refer to Table 6-6).

The assessment of air quality impacts on elevated receivers (refer to *Technical working paper: Air quality* (ERM, 2020)) due to the operation of the ventilation outlets found that:

- There would be no predicted adverse impacts at any existing building at any of the assessed heights (ranging up to 45 metres)
- There are predicted impacts for potential future developments above 20 metres, within 300 metres of the ventilation outlets. This would not necessarily preclude such development, although consideration of the ventilation outlets would be required during the rezoning or development application stage for proposed future development
- There are no restrictions to building heights within 300 metres of the Rozelle Interchange outlet
- Within 300 metres of the Warringah Freeway outlet, current planning controls for permissible habitable structures restrict buildings to below 20 metres
- Land use considerations would be required to manage any interaction between the project and future development for buildings with habitable structures above 20 metres and within 300 metres of the ventilation outlet
- Roads and Maritime would assist Inner West Council, North Sydney Council and the Department of Planning, Industry and Environment (as appropriate) in determining relevant land use considerations, which may include requirements for consultation with Roads and Maritime at the rezoning or development application stage.

Other property issues raised during community and stakeholder engagement for the project included concerns about potential impacts on property values for communities near the project. Property values are driven by a range of economic, social and amenity factors, for example housing supply and demand, interest rates, economic growth, local amenity and accessibility to such things as employment and social infrastructure. It is likely that broader external factors would influence property values more than perceived or actual impacts resulting from a road upgrade, including this project.

Ongoing consultation and communication about proposed changes before and during construction would help to reduce uncertainty and raise awareness of the project's benefits. Environmental management measures would be implemented during the construction phase to assist in managing potential property impacts near construction works. These would be developed in consultation with affected residents, as required.

6.2 Equity

Equity refers to a fair distribution of the resources that allow residents full participation in their community. Equity requires the wellbeing of people with fewer resources to be protected. Changes to conditions which may affect equity in the study area include impacts to amenity and liveability, including access and connectivity.

6.2.1 Construction impacts

During construction, many of the potential impacts such as changes to amenity and perceived impacts on liveability are expected to be experienced by those communities closest to surface works and construction support sites, or occupants of properties above the tunnel alignment. Potential impacts would mainly relate to construction noise, dust, vibration and changes in local access and connectivity. These impacts would be relatively short term in the context of the project's design life and localised to discrete locations. After construction, many of these communities would experience benefits relating to improved access and connectivity to destinations across the Greater Sydney region.

The overall significance of potential impacts on equity during construction is considered moderate-low, with the sensitivity of affected residents considered to be moderate and the magnitude of change considered low (refer to Table 6-6).

6.2.2 Operational impacts

Once operational, improved access and connectivity provided by the project would benefit the wider community and people living and working in or near the study area. Reduced congestion, improved journey times and improved movement of people and freight provided by the project would help to reduce travel time for individuals, families and the wider community, increase time available to individuals and families for leisure pursuits, and increase access to employment opportunities within convenient commuting times. Reduced traffic congestion and upgrades and amendments to bus infrastructure delivered by the project would also have benefits that would be shared by local and regional communities.

In conjunction with the Beaches Link and Gore Hill Freeway Connection project, the project would also help to reduce traffic on arterial roads in the study area, supporting local environment and amenity improvements in the study area and surrounding region, and improved access and connectivity for residents, business and industry in the study area, northern and south-western suburbs, and the Greater Sydney region.

6.3 Population and demography

6.3.1 Construction impacts

During construction, the construction workforce would generally be sourced from across the Greater Sydney region, although some specialist technical services or consultants may also be sourced from interstate or internationally as and when required. This is not expected to result in an influx of workers at a scale that would impact on population and demography in the study area.

As indicated in Section 6.1.2, sixteen residential properties would be fully acquired for the project and occupants of these properties would need to permanently relocate prior to construction. The relocation of residents associated with the acquisition of residential properties have potential to result in minor changes to population and demography at a local neighbourhood level, although potential changes in population would represent a very small proportion of the study area's population and are not expected to impact on the population and demography of the study area as a whole. They are also likely to be very minor in the context of expected population and demography changes associated with planned development within the study area. The sensitivity of communities to changes in population and the magnitude of change is low given the existing population of the study area. As a result, the overall significance of potential impacts of the project's construction on population and demography is considered low (refer to Table 6-6).

6.3.2 Operational impacts

Travel time savings and improved accessibility provided by the project are likely to make some locations within or near to the study area more attractive for people looking to relocate. While this change is expected to occur over time with ongoing development, the project is likely to contribute to the acceleration of development locally and regionally, particularly when considered in conjunction with the Beaches Link and Gore Hill Freeway Connection project.

6.4 Employment impacts

6.4.1 Construction impacts

During construction, the project would impact positively on employment through direct employment opportunities on the project and indirect employment opportunities in businesses and industries that support the project's construction.

A project of this scale is expected to support up to 7500 full time equivalent jobs (direct employment) during the five years of construction, including construction workers and professional and administration staff. Approximately 2600 full time equivalent jobs (2000 for Western Harbour Tunnel and 600 for Warringah Freeway Upgrade) can be expected to be supported during peak construction.

It is expected that construction workers would generally be sourced from across the Greater Sydney region, although some specialist technical services or consultants may also be sourced interstate or internationally as and when required.

The level of benefit for the study area from residents accessing employment would be dependent on the availability of workers. As indicated in Section 4.2.8, unemployment within the study area at the time of the 2016 Census was below the average for the Greater Sydney region. At a regional level, unemployment rates were also below the average for the Greater Sydney region. At the time of the 2016 Census, there were 186,332 people in the Greater Sydney region who worked in the construction industry, of which about 3800 people did not work any hours during the week prior to Census night and about 9865 people worked between one hour and 15 hours. Unemployment levels for the Greater Sydney region at the time of the 2016 Census were about six per cent, which was marginally below NSW at 6.3 per cent.

6.4.2 Operational impacts

During operation, the project would support improved access and connectivity to employment areas in the study area and the wider Sydney region. Some loss of local employment may be associated with changes to the business environment or the acquisition of properties accommodating businesses. This is most likely to affect those businesses that would experience changes to business operations or that would be required to relocate or cease operations. While the potential loss of local employment would be a concern for employees and owners of affected businesses, given the small number of commercial properties affected, this is not expected to impact on the overall levels of employment in the study area.

6.5 Business and industry

This section summarises the outcomes of the business impact assessment prepared by HillPDA. A copy of the business impact assessment report is provided in Appendix A and a summary is provided in the following sections.

6.5.1 Directly affected businesses

Based on the current design, two properties used for business/industrial purposes in addition to Cammeray Golf Course, would be totally or partly affected by the project (refer to Section 6.1). The project would also require the full lease of two properties accommodating business/industrial uses. One other property zoned for industrial uses would also be subject to full lease during construction, although this does not currently contain an operating business. Businesses subject to full lease or full acquisition would need to cease operation, to either relocate to another location or permanently close.

Businesses have specific and individual needs, relating to such things as the location of the business premises; access to the business by employees and customers and the ability to deliver and receive goods and services. Relocation or closure of businesses affected by acquisition, including cessation of leases, has the potential to result in:

- Disruptions to business operations
- Loss of revenue
- Relocation and re-establishment costs
- Employee training expenses for new employees
- Trade catchment alterations
- Business closure.

As indicated in Section 6.4.2, the acquisition of businesses also has potential to impact on employees, including through the loss of local employment. Overall, potential impacts associated with the acquisition of businesses would be somewhat mitigated by the implementation of the acquisition and compensation process in line with the *Determination of compensation following the acquisition of a business* guideline (NSW Government, date unknown), which provides direction in determining compensation for a business conducted on land that is acquired in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW).

Overall, the significance of business impacts associated with property acquisition is expected to be moderate, with the sensitivity of affected businesses and magnitude of impacts considered to be moderate (refer to Table 6-7 and Appendix A). Table 6-2 summarises potential impacts on businesses within the study area due to property acquisition for the project.

Table 6-2 Summary of directly affected businesses

| Location | Summary of impacts |
|-----------------------------|--|
| Waverton Working Waterfront | This site does not currently contain an operating business. The location does contain a number of buildings that have previously been used to support marine related services. As no businesses are operating, the impact of the project would be limited. |
| Cammeray Golf Course | The permanently impacted section of Cammeray Golf Course adjoins the Warringah Freeway corridor and Ernest Street. The project would allow for a reconfigured, nine-hole golf course to be maintained throughout construction and operation of the project (albeit with a shorter fairway). The operation of the pro-shop and function centre would not be impacted. |
| Waltham Street, Artarmon | The project would require the full acquisition of a property zoned for light industrial uses at Waltham Street, Artarmon. |

Source: Based on Western Harbour Tunnel and Warringah Freeway Upgrade, Business Impact Assessment (HillPDA, 2020). Refer to Appendix A for further details.

6.5.2 Construction impacts

During construction, potential impacts on businesses near the project may result from:

- Changes to passing trade and demand for services, resulting in positive and negative impacts for local businesses
- Changes in access and connectivity to businesses, resulting in both positive and negative impacts for employee and customer access, customer catchments and servicing and delivery, to local businesses
- Increased business visibility due to increased traffic volumes
- Increased noise, dust and construction traffic, impacting on business amenity at businesses near the project.

Sixty-four per cent of businesses surveyed for the business impact assessment indicated that they believed, during construction, the project would have no discernible positive or negative effects on travel time and access for employees and customers. Potential impacts of the project's construction phase on deliveries and loading arrangements was also considered to be neutral, with 64 per cent of businesses surveyed perceiving

construction would have a neutral effect. Overall, the business survey indicated most businesses perceived the project would have a neutral effect on demand for goods and services (HillPDA, 2020).

Table 6-3 provides a summary of business centres and potential impacts identified in the business impact assessment of the project's construction. Further detail about potential impacts is provided in Appendix A.

Table 6-3 Summary of construction impacts on business centres

| Centre | Summary of impacts |
|-------------------------------------|---|
| South Harbour Precinct | |
| Catherine Street centre | <p>Catherine Street Centre is a small centre serving a local catchment and some passing trade customers. Due to its location on a major arterial road that is proposed to be utilised for construction traffic and proximity to the construction sites, the centre may benefit from an increase in demand for services, business visibility and passing trade. Negative impacts are not anticipated during construction.</p> <p>Overall, construction of the project would have short-term, localised positive effects over the duration of project construction.</p> |
| Victoria Road/Darling Street centre | <p>Businesses in the area have a higher sensitivity to changes in amenity, employee and customer access and business visibility. Businesses are generally not as sensitive to employee productivity and communication and servicing and delivery. Due to the proximity of the temporary construction support site to the centre, amenity impacts are most likely to generate some change to the existing environment, with some businesses potentially experiencing negative effects. Conversely, the site's proximity to the centre is likely to increase business visibility and demand for services with more construction workers in the area. The traffic environment would experience small changes with some negative effects anticipated. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on centre viability as the site is proposed to be reinstated upon operation (see Chapter 20 (Land use and property) of the environmental impact assessment).</p> <p>The project would have short-term, localised impacts during construction that would affect businesses and the appeal of the centre overall. Some retail and service businesses may benefit from an increase in demand for services and passing trade. Overall, construction would have a discernible negative impact on the centre but would be short-term.</p> |
| Robert Street industrial centre | <p>The majority of businesses within the centre are generally destination services that customers visit specifically. The centre is unlikely to benefit from passive trade, business visibility or increased demand for services. The construction of the project may influence the efficiency of the road network, consequently having minor negative effects on deliveries and access for employees and customers. Potential effects on character and amenity, passing trade, employee productivity and communication and business visibility were not anticipated at this centre. Any effects would be temporary and would generally respond to standard mitigation measures. While there may be temporary impacts on the efficiency of accessing businesses during construction, there is not expected to be a lasting impact on centre performance.</p> <p>Construction of the project would generate discernible short-term, localised impacts on access and connectivity. Some retail and service businesses may benefit from an increase in demand for services and passing trade. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |
| James Craig Road working waterfront | <p>The majority of businesses within the centre are destination services that customers visit specifically. The centre is unlikely to benefit from passive trade, business visibility or increased demand for services. The construction of the project would negatively affect the efficiency and accessibility of the road network, consequently having an impact on deliveries and employee and customer access. The character and amenity of the area would change marginally due to construction works. Businesses in this location are less sensitive to amenity effects, access and connectivity. They would be able to adapt easily to the change. While there may be temporary impacts on the efficiency of accessing businesses during construction, there is not expected to be a lasting impact on centre performance.</p> |

| Centre | Summary of impacts |
|---------------------------------|---|
| | <p>Effects on character and amenity, passing trade and employee productivity and communication were not anticipated.</p> <p>Construction of the project would have a noticeable, short-term, localised negative impact on access and connectivity both on and off water. Businesses would be able to adapt to the change. Some businesses may benefit from an increase in demand. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |
| Chapman Road working waterfront | <p>The construction of the project would temporarily decrease the efficiency and accessibility of the road network, consequently having an impact on employee and customer access. Access arrangements would be altered for the centre however access to business would remain available. The character and amenity of the area would change due to construction works, however businesses in this location are less sensitive to amenity effects. Any effects would be temporary and would generally respond to standard mitigation measures. While businesses in the area would be sensitive to some changes, it is expected that they would retain a high ability to adapt to the change without business operations being affected. Effects on passing trade, employee productivity and communication, business visibility, demand for services and servicing and deliveries were not anticipated at this centre.</p> <p>Construction of the project would have a noticeable, short-term, localised negative impact on access and connectivity both on and off water. Businesses would be able to adapt to the change. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |
| North Harbour Precinct | |
| Miller Street Cammeray centre | <p>Any positive or negative effects would be experienced at an individual business level, with no discernible changes to overall performance of the business centre. While there may be a discernible change in employee and customer access, effects on character and amenity, passing trade, employee productivity and communication and servicing and deliveries were not anticipated. Businesses are generally reliant on the local resident and worker catchment that would still be able to access shops and services. It is expected that the centre would be able to adapt to changes. Businesses have a strong local catchment, and while construction would alter access arrangement, any changes would be minor. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |
| North Sydney CBD | <p>While there are likely to be temporary impacts on businesses during construction, there is not expected to be a lasting impact on centre viability. The project construction phase would temporarily reduce the efficiency of movement within the centre as well as accessibility of the centre, affecting employee and customer access and servicing and delivery. Passing trade and business visibility would be altered for businesses due to detours and increased construction vehicle movements. Some businesses may benefit from an increase in passing trade or demand for services. While businesses would be sensitive to changes, generally they would retain a high ability to adapt to the alterations and would be able to continue operating.</p> <p>The project would have short-term, localised impacts during construction that would affect businesses either positively or negatively. Construction of the project would create a clearly noticeable alteration to the centre environment. Overall, construction would have a discernible, negative impact on the centre, but this impact would be short term.</p> |
| Kirribilli centre | <p>Any effects would be experienced at an individual business level, with limited discernible changes to overall performance of the business centre. Changes to the road network would be noticeable and may affect the efficiency of access for employees, customers and for servicing and deliveries. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on the centre. Effects on character and amenity, passing trade and employee productivity and communication were not anticipated at this centre. The area has strong local catchment, primarily serving residents, workers and the occasional visitor. Construction in the area may benefit food, beverage and convenience retailers.</p> <p>Businesses have a strong local catchment, and while construction would alter access arrangement and potentially marginally increase demand for services, any positive or negative changes would be minor. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |

| Centre | Summary of impacts |
|---------------------------------|--|
| Bay Road Waverton centre | <p>Bay Road Waverton is a small centre serving a local catchment and some passing trade customers. Due to its location on a construction access road, the centre may benefit from a minor increase in demand for services, business visibility and passing trade. Negative impacts are not anticipated during construction.</p> <p>Overall, construction of the project would have short-term, localised positive effects over the duration of project construction.</p> |
| St Leonards - Crows Nest centre | <p>Changes to the road network may affect the efficiency of access for employees, customers and for servicing and deliveries. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on the performance of the centre. Effects on character and amenity, passing trade, employee productivity and communication, business visibility and demand for services were not anticipated at this centre. Businesses in this area have a strong trade catchment and are slightly separated from construction works. Generally, they would retain a high ability to adapt to any changes.</p> <p>Construction of the project would have some short-term, localised negative impact on access and connectivity. Businesses would be able to adapt to the change. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |
| Military Road Cremorne centre | <p>Changes to the road network may affect the efficiency of servicing and deliveries. Businesses are unlikely to experience changes to business visibility, amenity and passing trade. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on the performance of the centre. Effects on character and amenity, passing trade, employee productivity and communication, business visibility, demand for services were not anticipated. Due to the distance of the centre from proposed construction works, businesses are unlikely to be sensitive to changes.</p> <p>Businesses have a strong local catchment, and while construction would alter access arrangement, any changes would be minor. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |
| Neutral Bay Junction | <p>Neutral Bay is located at the start of the Neutral Bay–Mosman peninsula and generally benefits from passing trade as people travel to and from work. Most businesses would be able to adapt to changes in the environment. The centre has a strong local catchment serviced by both workers and residents in the local area and those from further north travelling along Military Road to access other employment centres. Changes in access and connectivity may deter customers from travelling to the centre or stopping due to higher amounts of congestion. Businesses are unlikely to experience changes to business visibility and amenity. The construction work would result in more congestion in the area and reduced accessibility. Effects on character and amenity, employee productivity and communication and business visibility were not anticipated at this centre. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on the performance of the centre.</p> <p>Businesses have a strong local catchment, and while construction would alter access arrangement and potentially marginally increase demand for services, any positive or negative changes would be minor. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |
| Artarmon industrial centre | <p>Construction of the project would generate a minor discernible change to the amenity of Artarmon industrial precinct. Effects on employee and customer access, passing trade, servicing and delivery and business visibility were not anticipated at this centre. As an industrial location, businesses in the area generally have low sensitivities to changes in amenity and can easily adapt to change. While they are more sensitive to access and connectivity changes, no discernible impacts are identified. Some businesses may benefit from an increase in demand for services.</p> <p>Construction of the project would have some short-term, localised effects; however, any positive or negative changes would be minor. Overall, construction is not anticipated to effect ongoing centre or business performance.</p> |

Source: Based on Western Harbour Tunnel and Warringah Freeway Upgrade, Business Impact Assessment (HillPDA, 2020). Refer to Appendix A for further details.

Maritime businesses

The following summarises findings from the business impact assessment (HillPDA, 2020) relating to construction activities on maritime businesses near the project. Further information is also provided in the business impact assessment report in Appendix A.

- Construction activities have potential to affect employee and customer access due to impacts on ferry services associated with the alterations in access to Birchgrove Ferry Wharf and partial closure of Sydney Harbour between Birchgrove and Berrys Bay. The Harbour CBD is a major employment location and reduced accessibility and efficiency of trips to this location has potential to affect a large number of employees and customers. Some customers may also be less inclined to travel to the city with a potential loss of expenditure for businesses in this location, particularly for customer interfacing businesses such as retailers, food and beverage services and personal services. This expenditure would likely shift to another business centre that would benefit from the alterations. Overall, the sensitivity of affected users and magnitude of change is considered moderate, resulting in the significance of impacts on employee and customer access being assessed as moderate
- The scheduled partial closures of Sydney Harbour would restrict larger vessels, including oil tankers, in crossing the Harbour between Birchgrove and Berrys Bay. This would restrict Harbour access (for up to 48 hours in any one period) to the Viva Energy Oil terminal located on the Greenwich Peninsula north of the project resulting in scheduling inefficiencies and potential lost revenue for the company. Cruise ships would not be affected by these closures as the terminals are positioned outside the restriction zone. White Bay berths 2, 4 and 5 (cruise terminal), Baileys Marine Fuels, and Glebe Island berths 1, 2, 7 and 8 would not be impacted by the construction activities. White Bay berth 3 is proposed to be used for handling dredged material for the project. The sensitivity of affected businesses are considered low and potential magnitude of change is considered moderate, resulting in the significance of impacts on access capacity being assessed as moderate-low
- Scheduled partial closures of Sydney Harbour (for up to 48 hours in any one period) and alteration of routes has potential to affect tourism businesses such as Harbour cruises or Cockatoo Island visitors as the appeal of the experience is reduced due to time delays and reduced amenity. Customers for water taxis and boat hire may also reduce due to potential alteration of the efficiency of the trips or appeal of accessing certain areas. Ferry operators may also experience a reduction in patrons due to the delayed journey. Increased construction traffic on Sydney Harbour may also generate delays in vessel movements, particularly for larger vessels such as cruise ships. This may be particularly experienced around White Bay where the cruise terminal and temporary construction support site are on the same peninsular. Overall, the sensitivity of businesses and magnitude of change are considered moderate, resulting in the overall significance of impacts being assessed as moderate
- Changes to character and amenity of Sydney Harbour due to increased construction barge and boat movements and construction activities has the capacity to affect businesses, particularly tourism businesses that attract clients due to the experience and appeal of Sydney Harbour. The increased vessel numbers and presence of marine construction activities may deter customers from hiring or chartering boats or recreational marine crafts, particularly from businesses around the construction area. Overall, the sensitivity of businesses and magnitude of change are considered moderate, resulting in the overall significance of impacts being assessed as moderate (HillPDA, 2020).

While there may be temporary impacts on some maritime businesses during construction, lasting impacts on businesses are not expected. Overall, construction of the project would have short term negative effects at an individual business level, with no discernible changes to the broader maritime business environment (refer to Table 6-6 and Appendix A) (HillPDA, 2020). Chapter 8 (Construction traffic and transport) of the environmental impact statement provides information on safeguards to manage impacts from maritime construction activities.

Freight and efficiency costs

Increases in travel times directly affect business expenditure and productivity. During construction, the closure of the Warringah Freeway during various night time periods and access restrictions between Miller Street and

High Street, would potentially cause delays and disruptions for road users, including freight. Detours would potentially result in substantially increased traffic on alternate routes during the closure periods. These changes would influence travel time and efficiency of freight trips, potentially resulting in additional costs to businesses and reduced productivity. These changes can also influence product distribution and delivery with servicing to businesses generally happening outside business hours (HillPDA, 2020).

Overall, the significance of impacts on freight and efficiency costs during construction is expected to be moderate, with the sensitivity of affected businesses and magnitude of change considered to be moderate (refer to Table 6-7 and Appendix A) (HillPDA, 2020). Chapter 8 (Construction traffic and transport) of the environmental impact statement provides information on safeguards to manage impacts on transport routes during construction.

6.5.3 Operational impacts

During operation, potential impacts on local businesses near the project may result from:

- Changes to passing trade and demand for services, resulting in positive and negative impacts for local businesses
- Changes in access and connectivity, resulting in both positive and negative impacts for local businesses relating to employee and customer access, demand for services, trade catchments, and servicing and delivery
- Increased business visibility due to additional traffic passing businesses at some locations.

About half of respondents to the business survey considered operation of the project would be positive for employee and customer access, while about 47 per cent stated the operation of the project would have a positive effect on servicing and delivery. The potential for reduced exposure during operation was considered with 91 per cent of businesses identifying that they are dependent on business exposure and visibility and 62 per cent identifying they are 'majorly dependent'. Miller Street, Cammeray, Military Road, North Sydney, Spit Junction and Victoria Road/Darling Street were the surveyed business centres that recorded the highest dependencies (HillPDA, 2020).

Table 6-4 provides a summary of business centres and potential impacts identified in the business impact assessment of the project's operation. Further detail is provided in Appendix A.

Table 6-4 Summary of operational impacts on businesses centres

| Centre | Summary of impacts |
|-------------------------------------|---|
| South Harbour Precinct | |
| Victoria Road/Darling Street centre | <p>The Rozelle area is anticipated to experience an increase in traffic demand and accessibility with the establishment of the Western Harbour Tunnel. Although the Victoria Road/Darling Street business centre does not directly adjoin the interchange, it is positioned on a main feeder road with the capacity to benefit from increased vehicle movements past the centre. The additional connection across the harbour to Rozelle also has the capacity to increase the trade area of some businesses, with the area now more accessible to a broader customer catchment. Any localised negative changes in access and connectivity would unlikely be discernible or businesses would be able to adapt to the change. Effects on employee productivity and communication, business visibility and demand for services are not anticipated at this centre.</p> <p>Overall, the project would have long term positive effects on the business environment.</p> |
| Robert Street industrial centre | <p>The majority of businesses within the centre are destination services that customers visit specifically. The centre would marginally benefit from increased connectivity and accessibility with the capacity for trade catchments to expand and passing trade to improve. The benefits would primarily arise from improvements in access, with the identity and character of the centre unlikely to be affected by the project. Effects on character and amenity, employee productivity and communication and business visibility were not anticipated at this centre.</p> |

| Centre | Summary of impacts |
|-------------------------------------|---|
| | Overall, the project would have long term positive effects on the business environment. |
| James Craig Road working waterfront | <p>The majority of businesses within the centre are generally destination services that customers visit specifically. The centre would benefit from increased connectivity and accessibility with the capacity for trade catchments to expand. Employee and customer access would substantially improve with both road network efficiency and connectivity improvements. Businesses in the area would experience enhanced visibility with the marine-related services also benefiting from a potentially enhanced demand for services. For businesses that are dependent on servicing, delivery and distribution, the new road infrastructure provides benefits. Effects on passing trade and employee productivity and communication were not anticipated at this centre.</p> <p>Overall, the project would have long term positive effects on the business environment.</p> |
| Chapman Road working waterfront | <p>The majority of businesses within the centre are generally destination services that customers visit specifically. The centre would benefit from increased connectivity and accessibility with the capacity for customer trade catchments of the marina and boat hiring services to expand. Employee and customer access would substantially improve with both road network efficiency and connectivity improvements. Effects on passing trade, employee productivity and communication and business visibility were not anticipated at this centre.</p> <p>Overall, the project would have long term positive effects on the business environment.</p> |
| North Harbour Precinct | |
| North Sydney CBD | <p>North Sydney is a high density, mixed-use and diverse metropolitan centre with a high level of employment and economic productivity. A part of this productivity is derived from the ease to which employees, customers, goods and services are able to get to and from the centre.</p> <p>Although North Sydney would experience some localised impacts that would have minor effects on travel time from some localities, these impacts would generally be offset by the benefits arising from broader network improvements. Businesses in North Sydney would retain a high ability to absorb and adapt to the changes. For example, people working or visiting North Sydney CBD may choose to take an alternative transport method or route, leave earlier or later, or even just factor in more travel time. While localised impacts would be discernible, the project would have long-term strategic benefits, which would offset any localised impacts to access and connectivity experienced by businesses.</p> <p>The project would result in an improvement in road-based travel times, on most routes, which would substantially increase the number of people that can access North Sydney within 30 minutes and improve network servicing and delivery efficiencies. The project would increase the potential trade catchment of a number of businesses in the centre and improve the labour catchment, increasing the appeal of North Sydney as place for business investment and as a place to work. These changes have the capacity to improve business productivity and revenue, enhancing the economic prosperity of the Harbour CBD.</p> <p>The project would have long term strategic benefits, with few discernible localised impacts. Businesses would retain a high ability to absorb and adapt to any localised impacts. Overall, the project would have a substantial positive outcome for businesses within North Sydney.</p> |
| St Leonards – Crows Nest centre | <p>The centre has a number of retail services that would be more sensitive to changes in servicing and delivery, however most would retain a high ability to adapt and absorb the change. The operational changes may cause shorter term inefficiencies as people get used to the changes. Generally, the scale of change would be limited to businesses in a small geographic area. Effects on passing trade, character and amenity, employee productivity and communication, business visibility and demand for services were not anticipated.</p> <p>The project would result in an improvement in road-based travel times, on most routes, which would substantially increase the number of people that can access St Leonards-Crows Nest strategic centre within 30 minutes and improve network servicing and delivery efficiencies. The project would increase the potential trade catchment of businesses in the centre and improve the labour catchment, increasing the appeal of St Leonards-Crows Nest as place for business investment and</p> |

| Centre | Summary of impacts |
|----------------------------|---|
| | <p>as a place to work. These changes have the capacity to improve business productivity and revenue, enhancing the economic prosperity of the strategic centre.</p> <p>Overall, the project would have long term positive effects on the business environment.</p> |
| Neutral Bay Junction | <p>Neutral Bay Junction would likely benefit from the increase in accessibility. Although the business centre is not located directly adjoining the Western Harbour Tunnel interchange, it is positioned on a main feeder road with the capacity to benefit from increased vehicle movements past the centre. The additional connection across the harbour to Rozelle and improved traffic flow across Sydney Harbour Bridge and Tunnel also has the capacity to increase the trade area of some businesses, with the area now more accessible to a broader customer catchment.</p> <p>Any negative impacts are generally confined to the Cammeray Golf Course. Due to the permanent reduction in the service offering and reduced amenity, demand from customers may reduce and affect business viability. The broader centre would be able to adapt to the change. Effects on employee and customer access, passing trade, servicing and delivery, character and amenity, employee productivity and communication, business visibility and demand for services were not anticipated.</p> <p>The project would improve connectivity to the centre from surrounding areas, including expanding the trade catchment of some population-serving businesses. Overall, the project would have long term positive effects on the business environment.</p> |
| Artarmon industrial centre | <p>The majority of businesses within the centre are generally destination services that customers visit specifically. The centre would substantially benefit from increased connectivity and accessibility with the capacity for trade catchments to expand. The benefits would arise from improvements in access, with the identity and character of the centre unlikely to be affected by the project. Effects on passing trade, character and amenity, employee productivity and communication and business visibility were not anticipated.</p> <p>Overall, the project would have long term positive effects on the business environment.</p> |

Source: Based on Western Harbour Tunnel and Warringah Freeway Upgrade, Business Impact Assessment (HillPDA, 2020). Refer to Appendix A for further details.

Maritime businesses

Once operational, the project is anticipated to have negligible impacts on businesses reliant on Sydney Harbour for their operation (HillPDA, 2020). The project would not result in a reduction in water depth at the proposed Harbour crossing. Refer to *Technical working paper: Traffic and transport* (Jacobs, 2020).

Freight and efficiency costs

Operation of the project would have positive, long term effects with the capacity to benefit businesses nationally through improved network efficiencies and cost savings. The project would provide travel time savings for freight trips that currently use the Sydney Harbour Bridge, Western Distributor and ANZAC Bridge corridor. Although unlikely to directly affect business and business centres through improvements in amenity, the additional capacity and travel time savings would improve product distribution and delivery, generating direct cost savings to businesses (HillPDA, 2020).

Employment and customer connectivity

The introduction of an additional transport connection provided by the project would improve the efficiency and capacity of the broader road, public and active transport network and assist in alleviating congestion and improving travel times. This would have a direct consequence on employment and customer connectivity, enhancing access to the strategic centres of North Sydney and St Leonards and the metropolitan Harbour CBD.

The introduction of an additional transport connection can lead to expanded trade catchment opportunities. The primary trade catchments (the area from which the business attracts or services 60-65 per cent of

customers) is likely to remain consistent, however there is capacity for the secondary trade catchment (the area from which the business attracts or services 20-30 per cent of customers) to increase. While not all centres within the study area would experience expanded trade catchment benefits, those businesses offering speciality services or products, or destination centres (such as North Sydney) may benefit from the expanded catchments (HillPDA, 2020).

Tolling

While no decision on tolls has yet been made, works for Warringah Freeway Upgrade includes provision for tolling gantries for northbound traffic should the government elect to introduce a northbound toll. The potential introduction of northbound tolling where it currently does not exist, may add expense to businesses, employees and customers crossing Sydney Harbour. The potential additional tolling expense may deter some customers from driving to a business centre (that induces a toll charge) if there is another centre offering similar services in a location without the toll charge. This would cause a redistribution of customer expenditure, potentially benefiting some locations while others are disadvantaged. Although customer behaviour may alter, the trade catchments of businesses would generally remain consistent as customer expenditure is redistributed equally on either side of the connection.

The direct cost to businesses and employees from paying any additional road toll charge would be negligible and offset by reductions in congestion and travel time savings. As such, the overall significance of impacts associated with tolling are expected to be moderate-low, with the sensitivity of affected businesses to tolling changes expected to be moderate and the magnitude of impacts considered to be low (refer to Table 6-7 and Appendix A) (HillPDA, 2020).

6.6 Social infrastructure

This section assesses potential impacts of the project on social infrastructure in the study area. It describes potential impacts on social infrastructure directly affected by property acquisition as well as other community services and facilities in the study area that may experience changes due to such things as changes in local access or changes in local amenity.

6.6.1 Directly affected social infrastructure

Social infrastructure would be directly impacted through partial property acquisition for surface or subsurface infrastructure or the temporary lease of land for use as construction support sites. This includes open space, parks and sport and recreation facilities. Impacts would include:

- Permanent loss of land used for recreational uses, including a portion of land within Cammeray Golf Course
- Temporary use of public open space areas for construction support sites (for example, Yurulbin Park and St Leonards Park), resulting in the temporary loss of access to and use of land within the construction footprint
- Reduced amenity due to construction activities and construction support sites and changes in noise, dust and visual environment, detracting from the use and enjoyment for users of social infrastructure near the project.

Table 6-5 provides a summary of potential impacts on social infrastructure directly impacted by the construction and operation of the project. Potential impacts on social infrastructure in the broader study area are described in Section 6.6.2.

Table 6-5 Impacts on directly affected social infrastructure

| Social infrastructure | Summary of potential impacts |
|------------------------------------|--|
| Yurulbin Park and Birchgrove Wharf | <p>Construction</p> <p>Yurulbin Park would be used to support construction of the project tunnels under Sydney Harbour, including excavation of an access shaft and driven mainline tunnels, and tunnel fitout. Excavated spoil from the access shafts and tunnels would be removed via barge. After construction, areas of the park impacted by construction activities would be rehabilitated and reinstated and would be available for ongoing recreational uses.</p> <p>The use of the park for construction would result in the temporary loss of access to, and use of, land within the construction footprint for about 4.5 years. This would temporarily disrupt the use of this land for informal recreation activities such as walking and fishing, including access to Birchgrove Wharf, requiring users to access alternative facilities elsewhere. Impacts to Birchgrove Wharf would be temporary for the duration of construction at Yurulbin Point construction support site (WHT4). Alternative informal recreation facilities are located at Birchgrove Park, Elkington Park Ballast Point Park and Mort Bay Park. As indicated in Section 4.3.2, Yurulbin Park is a popular vantage point for New Year's Eve celebrations on Sydney Harbour. Closure of the park during construction would mean that local communities would need to seek other viewing locations for the duration of the construction phase, potentially increasing pressure on other locations.</p> <p>The temporary closure of Birchgrove Wharf would require people to use Balmain Wharf to access ferry services or to use alternative modes of transport, such as bus services. This may require some people to travel further to access these services, potentially limiting or discouraging some people from accessing public transport for some trips.</p> <p>The project would require the clearing of some established trees within the park for construction, trees along Louisa Road would be retained. The loss of trees is likely to be a concern for community members and impact on landscape and visual amenity for park users. The presence of construction infrastructure and a perceptible decrease in vegetation at the end of the Birchgrove Peninsula may also impact visual amenity for users of Yurulbin Park. This impact is likely to diminish over time as new landscaping planted as part of the site rehabilitation becomes established.</p> <p>Potential impacts on surrounding uses, including public transport access to the Birchgrove Wharf, associated with the use of the park for construction are described in Section 6.7 and Section 6.8. Potential impacts associated with broader uses of Sydney Harbour are described in Section 6.6.2.</p> <p>The sensitivity of Yurulbin Park to impacts is considered high while the magnitude of impacts is expected to be moderate given the duration of potential construction impacts. As a result, the overall significance of potential impacts to Yurulbin Park during construction of the project are assessed as high-moderate (refer to Table 6-6).</p> <p>Operation</p> <p>After construction, the project would not have any ongoing impacts on the use of Yurulbin Park and Birchgrove Wharf.</p> |
| St Leonards Park | <p>Construction</p> <p>Construction of the project would require the temporary use of a portion of land within St Leonards Park for a construction support site and for construction of the tunnel connection to the Warringah Freeway for about 12 to 18 months. This land is located next to North Sydney Bowling Club and includes grassed areas and vegetation. This would result in the temporary loss of access to and use of land within the construction footprint, temporarily disrupting the use of this land for informal recreation. Land affected by construction and not required for the ongoing operation of the project would be reinstated after construction and is not expected to impact on the long-term use of this area or the wider St Leonards Park. Construction of the project would also impact a small portion of land required to accommodate upgrades to the Falcon Street/Miller Street intersection. Further review of this intersection is currently being carried out and permanent impacts to St Leonards Park would be minimised or, where possible, eliminated.</p> <p>During construction, the presence of construction works, and increased noise, dust and construction traffic would temporarily diminish amenity of nearby facilities and other areas of the park. In particular, amenity impacts may occur for users of the North Sydney Bowls Club, North Sydney Oval, Bon Andrews oval and KU Grandstand Preschool due to their proximity to construction works. This may detract from the use and</p> |

| Social infrastructure | Summary of potential impacts |
|-----------------------|--|
| | <p>enjoyment for park users and discourage some people from accessing facilities within the park. Increased construction traffic and the presence of construction works may also impact on perceptions of safety for park users, including children attending KU Grandstand Preschool. Potential impacts on community values associated with St Leonards Park are described in Section 6.7.</p> <p>Clearing of mature trees would be required along the Warringah Freeway for construction. The loss of these trees would temporarily impact on the landscape and visual amenity of the park until new trees or landscaping becomes established. Clearing of these trees is also likely to be a concern for the local community with engagement for the project identifying community opposition to impacts to the park.</p> <p>The sensitivity of St Leonards Park to impacts is considered high while the magnitude of impacts is expected to be moderate given the duration of potential construction impacts. As a result, the overall significance of potential impacts to St Leonards Park during construction of the project are assessed as high-moderate (refer to Table 6-6).</p> <p>Operation</p> <p>Kerb and footpath adjustment works would occur on Miller Street southbound around the intersection with Falcon Street as part of construction of the project. These works would provide a new dedicated lane for left turning traffic from Falcon Street westbound to Miller Street southbound. Further review of the impacts in this area are currently being carried out and permanent impacts to St Leonards Park would be minimised or, where possible, eliminated.</p> <p>However, should the project require the permanent acquisition of a small area of St Leonards Park to accommodate these upgrades to the Falcon Street/Miller Street intersection this is not expected to impact on the ongoing use or functioning of the park and facilities within the park.</p> <p>The sensitivity of the area affected by the project's operation and the magnitude of the impact are considered low, resulting in the overall significance of potential impacts to St Leonards Park during operation of the project being assessed as low (refer to Table 6-7).</p> |
| Cammeray Golf Course | <p>Construction</p> <p>Impact on land within Cammeray Golf Course would result from the establishment of infrastructure required to service both the Western Harbour Tunnel and Warringah Freeway Upgrade project and Beaches Link and Gore Hill Freeway Connection project. The impacted section of the golf course adjoins the Warringah Freeway corridor and Ernest Street. The construction support site would occupy part of Cammeray Golf Course for a period of up to five years. Construction and longer-term operation of the motorway facilities and project support infrastructure at Cammeray would require reconfiguration of the golf course, including changes to some holes on the golf course (for example, reducing the length of fairways) and relocation of maintenance and water storage facilities. This would allow the course to remain operational during construction, although changes to the golf course may impact on the use and enjoyment of the golf course for some members, potentially resulting in some members and golfers accessing alternate golf courses.</p> <p>During construction, increased noise, dust and construction traffic may impact on the amenity of the golf course for some users and may also deter some people from using the golf course during the construction phase.</p> <p>Construction of the project would require the clearing of established trees within the golf course, including along the boundary with the Warringah Freeway. The loss of these trees may be a concern for some community members and may impact on the visual and landscape amenity of the surrounding area.</p> <p>Following construction, areas of the golf course not required for permanent project infrastructure would be reinstated and rehabilitated, including replacement trees and landscaping. Further discussion about the project's impacts on landscape and visual amenity are provided in the <i>Technical working paper: Landscape character and visual impact assessment</i> (WSP and Arup, 2020).</p> <p>The sensitivity of the golf course to change is considered moderate and the magnitude of the impact considered high given that the project's construction would result in a permanent change to the existing golf course. As a result, the overall significance of potential impacts to Cammeray Golf Course during construction of the project are assessed as high-moderate (refer to Table 6-6).</p> <p>Operation</p> <p>The golf course would continue to operate in its reconfigured layout during operation of the project.</p> |

| Social infrastructure | Summary of potential impacts |
|-----------------------|---|
| | <p>The establishment of the operational facility and project support infrastructure would change the visual setting of this location when viewed from within the golf course and adjoining sporting facilities and surrounding locations, including the Warringah Freeway and Ernest Street. Landscaping would be provided to reduce the visual impacts of these facilities when viewed from some locations. Further discussion about the project's impacts on landscape and visual amenity are provided in the <i>Technical working paper: Landscape character and visual impact assessment</i> (WSP and Arup, 2020).</p> <p>The sensitivity of the golf course to change is considered moderate and the magnitude of the impact considered high given that the project would result in a permanent change to the existing golf course. As a result, the overall significance of potential impacts to Cammeray Golf Course during operation of the project are assessed as moderate-high (refer to Table 6-7).</p> |
| ANZAC Park | <p>Construction</p> <p>Construction of the project would require the temporary occupation (for about six months) of land within ANZAC Park to support access for construction activities and to upgrade drainage infrastructure. The affected area would include grassed areas and vegetation. This would result in the temporary loss of access to and use of land within the construction footprint. This would temporarily disrupt the use of this land for informal recreation, although access would be maintained to other areas within the park for these activities. After construction, land affected by construction and not required for operation would be reinstated and is not expected to impact on the long-term use of ANZAC Park.</p> <p>During construction, the presence of construction works, and increased noise, dust and construction traffic, would temporarily diminish amenity within areas of the park outside of the construction support site. This may detract from the use and enjoyment for park users and discourage some people from accessing the park. Consideration of community events, such as the ANZAC Day Dawn Service at the memorial statue, in the planning of major construction activities will be important in managing potential construction impacts on the ongoing use of the park.</p> <p>Clearing of mature trees would be required along the Warringah Freeway and within the park for construction. The loss of these trees would temporarily impact on the landscape and visual amenity of the park until new trees or landscaping becomes established. Clearing of these trees is also likely to be a concern for the local community with the preference to retain all trees in the park identified through community consultation for the project. Refer to <i>Technical Working Paper: Landscape character and visual impact</i> (WSP and Arup, 2020) for an assessment of landscape and visual amenity impacts on ANZAC Park. Potential impacts on community values associated with ANZAC Park are described in Section 6.7.</p> <p>Overall, the significance of potential impacts to ANZAC Park during construction of the project are assessed as moderate-low, given the sensitivity of the park to impacts is expected to be moderate and the magnitude of the impact is considered low (refer to Table 6-6).</p> <p>Operation</p> <p>After construction, the project is not expected to impact the ongoing use or functioning of the park and facilities within the park. Clearing of mature trees would be required along the Warringah Freeway and within the park for operation of the project. Impacts associated with the removal of mature trees within the park are discussed above.</p> <p>The sensitivity of the area affected by the project's operation and the magnitude of the impact are considered low, resulting in the overall significance of potential impacts to ANZAC Park during operation of the project being assessed as low (refer to Table 6-7).</p> |
| ANZAC Avenue Reserve | <p>Construction</p> <p>During construction, the presence of construction works, and increased noise, dust and construction traffic, associated with the Warringah Freeway Upgrade may temporarily diminish amenity within the reserve. This may detract from the use and enjoyment of the reserve for some users. The sensitivity of the area affected by the project's construction and the magnitude of the impact are considered low, resulting in the overall significance of potential impacts to ANZAC Avenue Reserve during construction of the project being assessed as low (refer to Table 6-6).</p> <p>Operation</p> <p>The project would require the permanent strip acquisition of a small area of ANZAC Avenue Reserve to accommodate the widening of the Warringah Freeway. This is not expected to impact on the ongoing use</p> |

| Social infrastructure | Summary of potential impacts |
|----------------------------|--|
| | <p>or functioning of the park and facilities within the park. The sensitivity of the area affected by the project's operation and the magnitude of the impact are considered low, resulting in the overall significance of potential impacts to ANZAC Avenue Reserve being assessed as low (refer to Table 6-7).</p> |
| Merlin Street Reserve | <p>Construction</p> <p>Merlin Street Reserve would be used as a construction support site for the Warringah Freeway Upgrade (WFU7). Construction of the project would require the temporary closure of the reserve for a period of about three years. The use of the park for construction would result in the temporary loss of access to, and use of, open space within the construction footprint. This would temporarily disrupt the use of this land for informal recreation activities. After construction, the reserve would be rehabilitated and reinstated and would be available for ongoing informal recreation uses. Overall, the significance of potential impacts to Merlin Street Reserve during construction of the project are assessed as low, with the sensitivity of the reserve to impacts and the magnitude of the impact considered low (refer to Table 6-6).</p> <p>Operation</p> <p>The project would permanently impact a strip of Merlin Street Reserve to accommodate the widening of the Warringah Freeway. This is not expected to impact on the ongoing use of the reserve. After construction, other parts of Merlin Street Reserve used for construction would be rehabilitated and the project would not have any ongoing impacts on the use of this area.</p> |
| Rose Avenue Reserve | <p>Construction</p> <p>During construction, increased noise, dust and construction traffic may impact on the amenity of the reserve for some users due to works for the Warringah Freeway Upgrade. This reserve has very limited recreational value and amenity of the reserve is currently impacted by traffic using the Warringah Freeway. Clearing of some existing vegetation within this reserve may be required during construction, potentially impacting on landscape and visual amenity from surrounding areas. Overall, the significance of potential impacts to Rose Avenue Reserve during construction of the project are assessed as low, with the sensitivity of the reserve and the magnitude of the impact considered low (refer to Table 6-6).</p> <p>Operation</p> <p>The project would permanently affect a strip of Rose Avenue Reserve to accommodate the widening of the Warringah Freeway. This is not expected to impact on the ongoing use of the reserve.</p> |
| Jeaffreson Jackson Reserve | <p>Construction</p> <p>During construction, increased noise, dust and construction traffic may impact on the amenity of the reserve for some users due to works for the Warringah Freeway Upgrade, including the demolition and replacement of the Falcon Street shared user bridge. The use of the park for construction would result in the temporary loss of access to, and use of, open space within the construction footprint and would temporarily disrupt the use of this land for informal recreation activities. Potential impacts associated with temporary disruption to access and connectivity during the demolition and reconstruction of this bridge are described in Section 6.8.1.</p> <p>Clearing of some existing vegetation within this reserve may be required during construction, potentially impacting on landscape and visual amenity for park users and from surrounding areas. Overall, the significance of potential impacts to Jeaffreson Jackson Reserve during construction of the project are assessed as low, with the sensitivity of the reserve and the magnitude of the impact considered low (refer to Table 6-6).</p> <p>Operation</p> <p>After construction, the project is not expected to impact on the ongoing use of the reserve.</p> |

6.6.2 Impacts on social infrastructure in the wider study area

This section provides an overview of potential impacts of the project's construction and operation on social infrastructure in the wider study area.

Construction impacts

During construction, potential impacts on social infrastructure in the study area may result from:

- Reduced visual amenity and increased construction noise, dust and traffic, impacting on amenity for users of some social infrastructure
- Ground-borne noise and vibration from construction of the project tunnels, impacting on amenity for users of social infrastructure above the tunnel alignment
- Changes in local access and traffic disruptions and delays due to construction activities and increased construction traffic
- Access restrictions to sections of Sydney Harbour near construction works (refer to Section 6.8).

Social infrastructure located near the project is discussed in Section 4.3.2. During construction, impacts on amenity may be experienced by some users of social infrastructure due to the presence of construction infrastructure, construction noise and dust, and increased construction traffic, including heavy vehicles. This may detract from people's use and enjoyment of these facilities and discourage some users from using these facilities.

The presence of construction activities and associated noise, dust and construction traffic are likely to be a concern for facilities used by children, such as childcare centres, preschools and recreation facilities, potentially impacting perceptions of safety for children.

Construction activities at the Victoria Road construction support site (WHT2) at Rozelle (former Balmain Leagues Club site) have the potential to impact on the amenity of nearby social infrastructure such as Rozelle Public School. During construction there is potential to disrupt the use of outdoor areas and classrooms along Victoria Road. Noise from construction activities at the Victoria Road construction support site (WHT2) also have the potential to impact on the amenity of social infrastructure nearby the construction support site.

Noise, dust and construction traffic associated with construction works at Sydney Harbour north cofferdam (WHT6) and Berrys Bay construction support site (WHT7) have potential to impact amenity for users of Carradah Park, North Sydney State Emergency Services facility and the Coal Loader Centre for Sustainability. As indicated in Section 4.3.2, the Coal Loader Centre for Sustainability is a regional learning hub for sustainable living that is used for a range of community events and activities, and regularly hosts visits from school groups. Noise from construction activities at Sydney Harbour north cofferdam (WHT6) and Berrys Bay construction support site (WHT7) has potential to impact the amenity of outdoor areas. Other social infrastructure that may experience noise impacts from construction activities at construction support sites within or adjacent to Sydney Harbour include Greenwich Sailing Club (Yurulbin Point construction support site (WHT4) and Sydney Harbour north cofferdam (WHT6)); Ballast Point, Yurulbin Park (Yurulbin Point construction support site (WHT4)); and Balmain's Children Centre, Balmain Public School, Balmain Hospital, St Augustine's Catholic Church (White Bay construction support site (WHT3)).

Impacts on Wenona School at North Sydney are expected during the most noise intensive construction activities, mainly associated with the Ridge Street east construction support site (WFU6) and works for the widening of the Warringah Freeway. Construction works at the Ridge Street north construction support site (WHT9) also have potential to impact amenity at the school.

Construction works at Ridge Street north construction support site (WHT9) and for the widening of the Warringah Freeway may also have the potential to have noise impacts on two child care centres at Berry Street. Noise impacts may also occur at the Independent Theatre at Miller Street during works outside standard construction hours. Potential impacts on other social infrastructure within St Leonards Park from construction activities at Ridge Street north construction support site (WHT9) are described in Table 6-5.

Potential noise impacts for attendees of ANZAC Park Public School and North Sydney Boys High School are generally expected to be low due to the distance between the main construction works and the school buildings. Noise, dust and traffic associated with construction works at the Cammeray Golf Course

construction support site (WHT10) have potential to temporarily impact the amenity of nearby recreational facilities such as Cammeray Park, Cammeray-Neutral Bay Skate Park and Cammeray Croquet Club.

Construction works at the Waltham Street construction support site (WHT11) for the Motorway Control Centre at Artarmon may impact on the amenity of users of Butterflies Early Learning Childcare Centre at Waltham Street. Site access to the Waltham Street construction support site (WHT11) would be via Reserve Road and Dickson Avenue and traffic management measures would also be implemented to minimise potential construction traffic impacts and safety risks for children attending the childcare centre.

The sensitivity of social infrastructure to amenity impacts is considered moderate with some ability of social infrastructure to adapt to change. The magnitude of the impact is also considered moderate given the duration of potential construction impacts, resulting in the overall significance of amenity impacts at social infrastructure being assessed as moderate significance (refer to Table 6-6).

Construction activities for the Warringah Freeway Upgrade would be conducted near the James Milson Nursing Home and retirement village at Clarke Road at North Sydney. Temporary disturbances may be experienced due to noise, vibration and dust from construction activities and increased construction traffic. Some residents of these facilities may be more sensitive to effects of construction noise and changes in their living and care environments, due to their age or illness. The sensitivity of this facility to amenity impacts is considered high, while the magnitude of potential impacts is considered low. As such, the overall significance of amenity impacts to this facility are assessed as moderate (refer to Table 6-6).

Temporary changes to local access and connectivity for motorists, pedestrians, cyclists and public transport users may cause potential delays and disruptions from some people accessing social infrastructure near the project. As shown in Figure 4-10, a number of schools and child care centres are located near surface works and construction support sites at Rozelle, North Sydney, Cammeray and Artarmon. Increased construction traffic may influence some people's perceptions of safety for children and students, particularly during school drop-off and pick-up times. Access for emergency services near to construction works including to/from facilities such as the Artarmon Ambulance Super Station, would be maintained during construction. Measures would be implemented to manage any potential safety risks associated with construction traffic as described in Chapter 8 (Construction traffic and transport) of the environmental impact statement. Further discussion about potential impacts on access and connectivity from construction works is provided in Section 6.8, along with an assessment of potential impacts on users of Sydney Harbour.

During construction, temporary amenity disruptions would potentially be experienced by users of some social infrastructure located above or near the tunnel alignment due to vibration and ground-borne noise impacts from tunnelling. Social infrastructure near the tunnel alignment are shown in Figure 4-10. Those facilities that may be more sensitive to the effects of ground-borne noise and vibration include:

- Places of worship, such as Darling Street Anglican Church and Rozelle Presbyterian Church at Rozelle, St John the Evangelist Church at Balmain and St Thomas' Anglican Church at North Sydney
- Community uses such as the Balmain Courthouse, The Coal Loader Centre for Sustainability at Waverton and North Sydney Stanton Library
- Educational facilities such as North Sydney Public School, Wenona High School and Wenona Primary School.

Some users of these facilities may notice ground-borne noise and vibration for a short period as works occur beneath or near the property. This may result in short-term disruptions to the use of some facilities. Potential impacts would be managed through ongoing engagement with managers and users of these facilities. Further information about potential noise and vibration impacts are discussed in *Technical working paper: Noise and vibration* (Renzo Tonin & Associates, 2020). Overall, the sensitivity of social infrastructure located along the tunnel and magnitude of potential amenity impacts from tunnelling are considered low, resulting in the significance of potential impacts from tunnelling on the amenity of social infrastructure being assessed as low (refer to Table 6-6).

The implementation of safeguards and management measures, in conjunction with ongoing consultation and communication with local communities, would appropriately manage potential impacts social infrastructure (refer to Section 7).

Operational impacts

During operation, the project would contribute to improved access and connectivity to social infrastructure within and near the study area through improved travel time and travel time reliability. This would include:

- Major hospitals such as the Balmain Hospital at Balmain, Mater Hospital at North Sydney and Royal North Shore Hospital and North Shore Private Hospital at St Leonards
- Tertiary education facilities, including the University of Tasmania Sydney Campus at Rozelle, University of Sydney – Sydney College of the Arts, TAFENSW and the Australian Catholic University North Sydney Campus
- Regional and state sport and recreation facilities, such as Callan Park, Leichhardt Park, St Leonards Park, Balls Head Reserve, Birchgrove Park, Yurulbin Park and Waverton Park
- Major retail, commercial uses, cultural and community support facilities.

Decreased traffic noise impacts may be experienced by users of some social infrastructure near the Warringah Freeway Upgrade due to the forecast reduction in traffic volumes along existing surface roads. However, increased traffic demand on some surface roads, such as Johnston Street at Rozelle and Ernest Street, West Street and Miller Street at North Sydney, may result in increased traffic noise for nearby social infrastructure. Users of social infrastructure along these streets may experience noticeable noise impacts, for example ANZAC Park Public School at Ernest Street, and Jacaranda Cottage and St Mary's Catholic Church at Miller Street. Mitigation for affected receivers would include the use of low noise pavement, installation of noise barriers and, in some instances, treatment measures at properties. Further information about potential noise and vibration impacts are discussed in *Technical working paper: Noise and vibration* (Renzo Tonin & Associates, 2020).

Operation of the project may also result in impacts to some social infrastructure due to changes in local road access. For example, the project would remove access between the Warringah Freeway and Ernest Street. This may require some members and employees accessing the Cammeray Golf Course and other recreational facilities nearby to use alternative routes to access these facilities. Changes to the local road network at Falcon Street may also change access routes to social infrastructure within the North Sydney area, including to St Leonards Park for some users. This may increase travel distances and travel times for some users.

Overall, the significance of impacts on social infrastructure from the project's operation is considered low, with the sensitivity of social infrastructure to changes and the magnitude of potential impacts considered low (refer to Table 6-7).

6.7 Community values

6.7.1 Construction impacts

Potential impacts on community values during construction may be experienced by communities within the study area due to:

- Temporary adverse changes to local amenity for residents, businesses, facilities and public open space near construction support sites and surface works due to noise, dust and traffic generated from construction activities
- Temporary adverse changes in local amenity for occupants of properties located above the tunnel alignment due to ground-borne noise and vibration from tunnelling activities

- Light spill from night-time construction activities at construction support sites and construction works in road reserve areas at Rozelle and North Sydney
- Temporary changes in local access and connectivity, including for motorists, public transport users, pedestrians and cyclists, resulting in delays and disruptions
- Adverse changes in visual amenity and local character due to the presence of construction support sites and surface works, infrastructure and clearing of vegetation within the construction footprint.

These changes may impact on people's use and enjoyment of their homes, work places and public spaces. Delays and disruptions caused by changes to local access and connectivity may also inconvenience or cause frustration for some motorists and transport users.

Local amenity and character

During construction, land accommodating social infrastructure would be used for construction support sites and activities. This is likely to be a concern for some community members, with consultation for the project indicating strong community support to protect public open space. The presence of construction infrastructure and works may adversely affect community values relating to the amenity and character of these areas and influence people's use of open space areas.

Noise, dust, vibration, traffic, and visual impacts from construction activities may temporarily impact amenity for some residents and users of social infrastructure closest to surface works, impacting on their use and enjoyment of properties. Impacts on night-time amenity due to construction noise, vibration and light spill may also be experienced where construction works or construction deliveries or haulage are carried out outside of normal hours of work. Amenity impacts are most likely at properties near construction support sites used for tunnelling work and along the Warringah Freeway, properties located directly above the tunnel alignment or properties located along construction access routes for the Berrys Bay construction support site (WHT7). Amenity impacts from construction activities have potential to disturb some people's use of their homes, businesses and other facilities, cause inconvenience or annoyance for some people, or disrupt sleeping patterns for some residents. Further discussion about potential amenity related impacts such as construction traffic, noise and air quality are discussed in the *Technical working paper: Traffic and transport* (Jacobs, 2020b), *Technical working paper: Noise and vibration* (Renzo Tonin & Associates, 2020), *Technical working paper: Air quality* (ERM, 2020) and *Technical working paper: Landscape and visual impact* (WSP and Arup, 2020).

Sydney Harbour is of national significance and provides formal and informal recreational opportunities to both local and regional communities as well as access for a range of maritime functions for both business and community, including transport services, tourism, commercial fishing operations, and ports. Locations within Sydney Harbour near to the Sydney Harbour south (WHT5) and north (WHT6) cofferdams would be subject to changes in the visual environment and noise impacts during construction activities within or next to the harbour. Visual and noise impacts during construction may disrupt or reduce the use and enjoyment of areas of the harbour and its surrounds that are near to construction activities, for some people, including for formal and informal recreational activities.

Sydney Harbour is also a focus for major community events for example, the Sydney New Years' Eve fireworks, Australia Day celebrations, and Sydney to Hobart yacht race. Construction works within or next to the harbour are generally located away from those areas of the harbour that are a focus for community events and are not expected to detract from the enjoyment of these events by the community. Construction marine traffic would also be managed to avoid impacts on major events in the outer harbour such as the Sydney to Hobart yacht race. As indicated in Section 4.3.2, Yurulbin Park is a popular vantage point for New Year's Eve celebrations on Sydney Harbour and the use of this area for construction would require local communities to seek other viewing locations, potentially impacting on their enjoyment of and participation in this event.

The implementation of safeguards and management measures, in conjunction with ongoing consultation and communication with local communities, would assist in managing potential impacts on local character and amenity (refer to Section 7).

The significance of potential impacts on local amenity and character as a result of the project's construction, at locations closest to surface works and construction support sites, are assessed as moderate, with the sensitivity of land uses to changes and the magnitude of potential impacts considered moderate (refer to Table 6-6).

Community cohesion

The project construction phase has the potential to impact community cohesion within the study area by temporarily disrupting use of some social infrastructure and meetings places, such as Yurulbin Park. This may reduce opportunities for social and community interaction for local residents. As indicated in Section 6.6.1, amenity impacts on Cammeray Golf Course may deter some people from using the golf course during the construction phase. This has potential to temporarily disrupt some community and social networks associated with the golf club and possibly reduce members' participation in volunteering.

As discussed in Section 4.5.2, communities in the study area host a number of events that help to foster a sense of community and local identity that attract visitors from the study area and the wider region. During construction, reduced amenity of public spaces, temporary changes to road conditions and increased construction, traffic may discourage some residents, tourists and visitors participating in local festivals and events or detract from their enjoyment of these events. This has potential to temporarily reduce levels of social interaction for some communities.

Overall, potential impacts to community cohesion as a result of construction of the project have been assessed to have a moderate-low significance, with the sensitivity of meeting places to changes identified as moderate and the magnitude of the impact considered low (refer to Table 6-6).

The implementation of safeguards and management measures, in conjunction with ongoing consultation and engagement with local communities, would assist in managing potential impacts on community cohesion (refer to Section 7).

Community health and wellbeing

Some areas near construction support sites and along the Warringah Freeway are expected to temporarily experience impacts from construction activities that create extended periods of noise above the relevant assessment thresholds, including for sleep disturbance. This has the potential to disturb sleeping patterns for residents and occupants of buildings nearest to these works, potentially impacting health and wellbeing for some individuals. Further information on potential noise and vibration impacts, including proposed management measures for managing potential impacts, is provided in the *Technical working paper: Noise and vibration* (Renzo Tonin & Associates, 2020). Underwater noise generated from some construction activities within Sydney Harbour has potential to cause sound pressure levels that may affect people diving or swimming. Further information on potential impacts and management measures is provided in *Technical working paper: Human Health Assessment* (Environmental Risk Sciences, 2020).

The potential for construction dust to adversely impact on the health and wellbeing of groups in the community who may be more sensitive to changes in air quality (such as children, elderly or people who suffer asthma or similar conditions) is likely to be of concern for community members near construction activities. Potential risks to human health from construction dust are generally expected to be appropriately managed with the implementation of dust management measures. Further information on construction air quality is provided in *Technical working paper: Air quality* (ERM, 2020).

Increased construction traffic along roads within the study area may impact on perceptions of road safety. This would be particularly relevant in areas that attract higher numbers of pedestrians, such as near local centres or social infrastructure. Concerns about perceptions of safety are likely to be highest for people, such as the elderly, children and people with disability. For example, increased construction traffic and heavy vehicles using Ernest Street and Ridge Street could reduce people's perceptions of safety for children and students attending ANZAC Park Public School and Wenona School, particularly during drop-off and pick-up times.

Increased construction traffic and the presence of construction works along Victoria Road may also impact on perceptions of safety for children and students at Rozelle Public School.

The sensitivity of the general community to perceived health and safety impacts and the magnitude of possible impacts was considered low, resulting in the overall significance of potential impacts to community health and safety from the construction of the project being assessed as low (refer to Table 6-6).

The implementation of safeguards and management measures, in conjunction with ongoing consultation and communication with local communities, would assist in managing potential impacts on community health and wellbeing (refer to Section 7).

6.7.2 Operational impacts

Local amenity and character

Operation of the project may result in changes to local amenity and character of communities near the tunnel connections and Warringah Freeway. Increased traffic noise may be experienced by some receivers near the Rozelle Interchange due to forecast increases in traffic volumes on roads leading to and from the project. This may impact on some people's use of homes, businesses and facilities, particularly of outdoor areas, and cause inconvenience or annoyance for some people. Conversely, reductions in traffic noise levels may be experienced at some properties near the Warringah Freeway Upgrade due to the forecast decrease in traffic volumes along existing surface roads with traffic being moved to tunnels. This may have beneficial impacts on local amenity at some properties. Further detail about the operational noise impacts of the project are provided in the *Technical working paper: Noise and vibration* (Renzo Tonin & Associates, 2020).

The sensitivity of communities near the tunnel connections to adverse changes in local amenity and character and the magnitude of potential changes are considered low. As such, the overall significance of potential impacts on local character and amenity from the project's operation are assessed as low (refer to Table 6-7).

Community cohesion

During operation, the project would support improved travel and access to work, business and leisure activities in the study area and the wider Greater Sydney region. Travel facilitates social interactions, and where access on major routes is constrained, some people may avoid making trips. Improved accessibility and connectivity, decreased travel times and improved travel time reliability may encourage some people to make trips they otherwise wouldn't, helping to facilitate community cohesion.

Community cohesion is encouraged by connectivity or discouraged by barriers to movement. Changes to traffic on roads leading to and from interchanges may increase perceived barriers to local movements for pedestrians and cyclists, potentially influencing some people's access to services and meeting places. Falcon Street, in particular, creates the northern boundary of St Leonards Park. This road is likely to be perceived by some people as an existing barrier to local pedestrian and cycle movements, particularly during peak periods. Changes to traffic on this road may reinforce this perception, and potentially discourage some people from accessing facilities within St Leonards Park. Pedestrian connection across these roads would continue to be provided by signals at key intersections, which would assist in minimising this impact.

The scale of the Warringah Freeway creates an existing barrier to local movement between eastern and western areas of North Sydney. Upgraded active transport infrastructure provided by the Warringah Freeway Upgrade would improve pedestrian and cycle connectivity across the freeway, including to services and facilities within the North Sydney commercial centre. This would help to reduce community perceptions about the effect of the barrier and encourage movement between communities east and west of the freeway.

As indicated in Section 6.6.1, changes to the Cammeray Golf Course may impact on the use and enjoyment of the golf course for some members. While the course would continue to operate, this may potentially result in some members and golfers accessing alternate golf courses, particularly following possible disruptions associated with amenity changes during construction. Similar to many sporting clubs, Cammeray Golf Course

is likely to support long-standing community and social networks and is likely to be important meeting place for club members, particularly playing and life members. Potential loss of membership resulting from changes to the course due to the project may impact on social and community networks associated with the club and may reduce levels of volunteering within the club. The sensitivity of affected individuals is considered moderate and the magnitude of impact is considered low. As such, the overall significance of potential impacts on community cohesion due to permanent changes to Cammeray Golf Course are assessed as moderate-low (refer to Table 6-7).

Community health and wellbeing

The operation of ventilation facilities at Rozelle and Cammeray may influence some people's perceptions of air quality in surrounding areas. This was raised as a concern for surrounding residents and users of social infrastructure near ventilation outlets during consultation for the project (for example, Easton Park, Buruwan Park, ANZAC Park Public School, ANZAC Park, Cammeray Park, Cammeray-Neutral Bay Skate Park, Cammeray Tennis Club, ANZAC Park Public School and Wenona School).

The ventilation outlets would be designed to effectively disperse emissions from the tunnels. The air quality assessment found the project may result in improved air quality, compared to without the project. Reduced surface traffic volumes are also likely to result in improvements to local air quality. At a regional level, potential impacts on air quality would be negligible and generally undetectable. Further information on operational air quality is provided in the *Technical working paper: Air quality* (ERM, 2020). The health impact assessment also found that potential health impacts associated with changes in air quality in the local community are considered to be acceptable. The overall significance of this impact is assessed as negligible, with the sensitivity of affected communities considered moderate and the magnitude of the impact considered negligible (refer to Table 6-7). Further information on health impacts associated with the project's operation is provided in Chapter 13 (Human health) of the environmental impact statement.

The project would support improvements in road safety, with reduced traffic demands along key surface road transport corridors, resulting in a forecast reduction in crashes across the network. Further discussion about road safety changes is provided in Chapter 9 (Operational traffic and transport) of the environmental impact assessment.

6.8 Access and connectivity

Construction and operation of the project has the potential to affect access and connectivity at a regional, local and property level. This section provides a summary of potential impacts of the project on access and connectivity at a local and regional level.

Further discussion regarding the project's impacts on traffic and transport is provided in *Technical working paper: Traffic and transport* (Jacobs, 2020b).

6.8.1 Construction impacts

During construction, potential short-term impacts on access and connectivity would generally result from:

- Temporary changes to road conditions near construction activities, including partial and full road closures, temporary diversions and access changes, and removal of some on-street parking such as at Ridge Street, Alfred Street North, Ernest Street and Dickson Avenue, resulting in possible delays and disruptions for motorists and other road users
- Increased construction traffic on roads within the study area, including heavy vehicles used to deliver materials and equipment and construction worker vehicles, potentially impacting on perceptions of road safety for motorists, pedestrians and cyclists
- Potential disruptions to bus services, including from changes to road conditions and the temporary relocation of some bus stops near construction works for safety, resulting in possible delays and disruptions for bus users and changes in bus access for some people

- Changes to pedestrian and cycle access near construction works, resulting in possible disruptions or changes to perceived safety for some users.

Road users

The project construction phase would require the closure of the Warringah Freeway lanes or carriageways during various evening and night time periods (6pm to 5am). This has potential to cause delays and disruptions for motorists and other road users, and increased traffic on other arterial roads used as detours during the closure periods. Notification about the type of closures of the Warringah Freeway would be carried out during construction, helping to minimise potential impacts of road changes for motorists and other road users.

During construction, the project would result in an increase in construction traffic on roads near construction support sites, including light vehicles for construction workers and heavy vehicles associated with haulage of spoil, materials and equipment. This has the potential to impact on community perceptions of safety for road users, including pedestrians and cyclists.

Roads which are likely to experience increased construction traffic during construction include:

- James Craig Road at Rozelle to provide access to the White Bay construction support site (WHT3)
- Bay Road and Balls Head Road at Waverton to provide access to the Berrys Bay construction support site (WHT7)
- Ridge Street at North Sydney to provide light vehicle access during construction and heavy vehicle access during early works to the Ridge Street north construction support site (WHT9) and Ridge Street east construction support site (WFU6)
- Merlin Street at North Sydney to provide access to the Merlin Street construction support site (WFU7) and allow for the modification of the Ernest Street/Merlin Street intersection
- Alfred Street North at North Sydney to allow for construction associated with the Ridge Street pedestrian bridge
- Ernest Street at Cammeray to provide access to the Cammeray Golf Course construction support site (WHT10)
- Reserve Road and Dickson Street at Artarmon to provide access to the Waltham Street construction support site (WHT11).

Other roads would also be used by construction vehicles associated with the Warringah Freeway Upgrade, including Walker Street and Rosalind Street. Access to all other construction support sites would be provided from major roads such as Victoria Road, Blue Street, Ernest Street, Walker Street, Miller Street, Berry Street, Falcon Street, Arthur Street, High Street and the Pacific Highway. The sensitivity of road users to changes in construction traffic and the magnitude of impacts are considered moderate. As such, the overall significance of impacts on road users are assessed as moderate (refer to Table 6-6).

As indicated in Section 4.3, some roads used for construction access and haulage accommodate social infrastructure, such as schools, child care, places of worship, and open space, sport and recreation facilities. These include Alfred Street North, Falcon Street, Berry Street, Walker Street, Ernest Street, Victoria Road and Bay Road. Some of these roads also accommodate significant pedestrian activity. The increased presence of heavy vehicles along construction access and haulage roads may impact on perceptions of safety for some users of these facilities, particularly for facilities used by high numbers of children. The implementation of traffic management measures would assist in managing potential safety impacts. Possible measures would include limiting heavy vehicle access near schools and child care centres during drop-off and pick-up times, or during community events that attract large numbers of visitors. Ongoing engagement and communication with managers and users of social infrastructure about haulage activities and potential safety risks would also assist in managing potential impacts. The implementation of education and awareness programs for construction workers and transport operators about potential road safety impacts would also help to maintain safety for children and local communities.

Car parking

The project construction phase would require the removal of some parking on roads providing access to construction support sites. This includes:

- About 12 parking spaces on Ridge Street to allow access to the Ridge Street north construction support site (WHT9), which may connect with Ridge Street east construction support site (WFU6)
- Up to 10 parking spaces would be removed on Ernest Street to allow access to Cammeray Golf Course (WHT10).

It is expected that the reduced parking at Ridge Street and Ernest Street could be accommodated by parking on nearby local roads and is not expected to impact on overall parking at these locations.

Up to 100 long-stay paid parking spaces on Alfred Street North (between Wyagdon Street and Whaling Road) would also be removed at the commencement of construction works, although 23 new parking spaces would be provided between Ridge Street and Whaling Road following completion of works. This would result in a net permanent loss of 73 on-street parking spaces in North Sydney and Neutral Bay, given there are no alternatives nearby.

Car parking for the construction workforce would be provided at some construction support sites. Where required, shuttle bus transfers between construction support sites would also be provided. Where on-site parking is not provided or where provision of on-site parking cannot accommodate the full construction workforce, the workforce would be required to park on the surrounding road network. To minimise the potential worker parking impacts on the road network, the construction workforce would be encouraged to use public transport where possible. Overall, potential impacts on local parking have been assessed to have moderate significance, with the sensitivity of road users and magnitude of impacts considered moderate (refer to Table 6-6).

Public transport services

During construction, impacts on bus services in the study area may result from delays and disruptions on the wider road network. In addition, changes may be required to local bus services near construction works. This may include the temporary relocation of some bus stops located close to construction support sites, as well as delays or changes in local routes due to temporary road closures, such as during the closure periods of the Warringah Freeway. This may have a greater impact on people with limited mobility, such as the elderly or people with a disability. Early and ongoing engagement with bus operators and bus users about changes to local bus routes and bus stops would be carried out during construction. This would assist in managing potential impacts on commuters.

As discussed in Section 4.5.1, Sydney Harbour is highly valued for its natural assets and landscape amenity; historical and cultural associations; sporting, recreation and leisure activities; transport and trade functions; and tourism and economic activities (Hoisington, 2015). The construction of the project would require up to seven closures of Sydney Harbour to maritime traffic between Birchgrove and Berrys Bay for a period of about 48 hours. Ferry services would be impacted during the closure of Sydney Harbour, with passengers travelling via the F3 Parramatta River line and F8 Cockatoo Island line required to use replacement bus services. Recreational marine traffic would also not be able to use this section of Sydney Harbour during the closure.

The project construction phase would also require the closure of the existing Birchgrove Wharf for a period of about 48 months, during use of the Yurulbin Park construction support site (WHT4). During this time, people would be required to use alternative facilities to access ferry services such as the Balmain Ferry Wharf, which is located about two kilometres from Birchgrove Wharf. Alternatively, commuters could use bus route 441 from Grove Street about 750 metres from Birchgrove Wharf or services operating along Victoria Road for access to the Sydney CBD. This may require some passengers to walk further distances to access alternative modes of transport. Early notification of proposed changes to the ferry network would be provided to allow customers to plan their journeys. Appropriate signage would also be provided at ferry wharves informing patrons of any changes.

The sensitivity of commuters to changes in public transport services are considered moderate, with the magnitude of impacts considered low. As such, potential impacts to public transport during construction of the project are generally assessed as being of moderate-low significance (refer to Table 6-6).

Maritime transport

Construction activities in the inner harbour (related to the Sydney Harbour crossing) would result in minor increases in transit time for recreational, commercial and government vessels and require sailing clubs to alter their courses while construction activities are underway. Navigational restrictions would temporarily restrict access of larger vessels such as oil tankers to cross the Harbour between Birchgrove and Berrys Bay.

Marine Rescue NSW would not be directly impacted by the construction activities. However, construction activities may impact on emergency response time in the outer harbour or offshore. Marine Rescue NSW would be consulted about the timing of proposed construction works and potential measures to manage impacts on emergency response times. This could include increased patrols operating out of Middle Harbour servicing the outer harbour and offshore during periods when construction activities have potential to impact on response time of the Marine Rescue NSW base at Birkenhead Point.

The project construction phase would require the temporary relocation of about 10 private moorings near the Berrys Bay construction support site (WHT7). Relocated moorings would be placed as close as possible to their original locations during construction and would be restored to their original position on completion of the project. Further discussion regarding the temporary relocation of moorings is provided in Chapter 8 (Construction traffic and transport) of the environmental impact statement.

Overall, potential impacts on maritime transport during construction would generally be limited to maritime movements near to construction plant and equipment in the inner harbour. These impacts have been assessed to have a moderate-low significance, with the sensitivity of maritime users considered moderate and magnitude of impacts low. Potential impacts on maritime users and movements elsewhere, including the outer harbour, are assessed as negligible, with the sensitivity of maritime users considered low and the magnitude of impacts considered negligible (refer to Table 6-6). Further discussion about impacts of construction on marine transport is provided in Chapter 8 (Construction traffic and transport) of the environmental impact statement.

Active transport

As discussed in Section 4.6, walking and cycling is an important mode of transport for residents, workers and visitors in the study area. During construction, temporary closures or changes to pedestrian and cycle paths would be required near construction works for the safety of pedestrians and cyclists. Temporary closures of pedestrian and cycle paths would include the shared user path along Ernest Street.

Detours would be provided for pedestrians and cyclists during temporary closure periods. This may impact on community perceptions of safety for pedestrians and cyclists. In addition, the cycleway underpass below the eastern side of the Falcon Street Bridge would be removed during construction. Pedestrians and cyclists would be required to travel further distances via existing zebra and signalised pedestrian crossings spanning Falcon Street and Military Road, or travel across the Falcon Street shared user bridge. Overall, the sensitivity of individuals due to changes to this existing access and magnitude of potential impacts are considered low, due to existing low volumes of pedestrians and cyclists using the underpass. As such, the overall significance of impacts on active transport are considered low (refer to Table 6-6).

Property access

Access to private properties near proposed works is expected to be maintained during construction. Where temporary changes are required, suitable access arrangements would be implemented in consultation with affected property owners. The sensitivity of individuals to changes in private property access and magnitude of impact are considered negligible, resulting in an overall significance of impacts on property access being assessed as negligible (refer to Table 6-6).

6.8.2 Operational impacts

The project would improve regional access and connectivity for motorists and other road users by providing an alternate crossing of Sydney Harbour. The project would also improve travel times for road users on the Sydney Harbour Bridge, Sydney Harbour tunnel, ANZAC Bridge and Western Distributor, improving traffic flow and journey times for buses, freight and other vehicles accessing key commercial and employment centres including the Sydney CBD, St Leonards and North Sydney. This would have positive long-term impacts for motorists.

The opportunity for improved access to public transport for local communities would also be provided by the project. The project would improve bus services currently operating on the Warringah Freeway and Sydney Harbour Bridge through reduced congestion and increased reliability during peak periods.

The project would also allow new public transport routes to be developed in response to diverse travel demands and support new social and economic development. The new motorway tunnel would provide opportunities to introduce new express services, as well as improved travel times and reliability in peak periods on existing corridors; both of which would make buses a more attractive transport option, supporting future mode shifts to public transport.

Locally, the project would generally result in improved travel times along key routes in the Rozelle area, with traffic using Western Harbour Tunnel in preference to the ANZAC Bridge and Western Distributor. The project would also improve average travel speeds through the Warringah Freeway and North Sydney area, due to increased traffic volumes using the Western Harbour Tunnel instead of travelling across the Sydney Harbour Bridge or through Sydney Harbour Tunnel. Localised traffic and transport impacts, including localised delays and increased traffic demands on some roads, may result from the operation of the project, particularly at either end of the project where it would integrate with the existing transport network. These localised impacts would generally be offset by large travel time benefits provided by the project and overall, the broader network travel time and reliability benefits delivered by the project are expected to outweigh increases to localised delays. As such, the sensitivity of communities are considered low and the magnitude of change of localised delays and disruptions in the context of the overall project are generally considered negligible, resulting in an overall significance of localised delays and disruptions being assessed as negligible (refer to Table 6-7).

The project would improve cycle connectivity as part of the Warringah Freeway Upgrade. In operation of the project, there would be no ongoing impacts to the use of Birchgrove Wharf. Moorings impacted during construction would be reinstated as close as possible to their current locations. Local adverse impacts on public transport would mainly be associated with localised increases in travel times during the busiest peak periods on some bus routes through North Sydney, in the absence of further management measures. Given the localised nature of these potential impacts, the sensitivity of communities and the magnitude of change are generally considered low, resulting in an overall significance of public transport impacts being assessed as low (refer to Table 6-7).

A detailed assessment of potential operational traffic impacts of the project is included in Chapter 9 (Operational traffic and transport) of the environmental impact statement.

6.9 Cumulative impacts

Cumulative impacts comprise the successive, incremental or combined effects of an activity when added to other past, present or reasonably foreseeable future activities. In particular, cumulative impacts can occur when impacts from the project interact or overlap with impacts from other projects and can result from actions that, individually, may be minor, but collectively could result in significant changes to the socio-economic environment.

A range of other transport infrastructure and urban development projects have started or are planned in or near the study area, including major transport infrastructure projects such as the Beaches Link and Gore Hill Freeway Connection, M4-M5 Link and the Sydney Metro & City Southwest, and planned future development within the South Harbour Precinct and North Harbour Precinct. In particular, a number of projects are currently

being planned near Glebe Island, such as the Glebe Island concrete batching plant and Glebe Island Multi-User Facility, and White Bay, such as the Baileys Marine refuelling and supply facility. Interaction with these projects may change the social impacts or benefits of the project.

During construction, potential cumulative impacts may be associated with:

- Prolonged duration of construction impacts, resulting in:
 - Extended periods of traffic disruptions for motorists, public transport users, pedestrians and cyclists, and commercial vehicle movements
 - Extended periods of impacts on amenity for communities in the study area, associated with increased noise, dust and traffic
- Increased construction traffic, associated with haulage of materials, plant and equipment for the various construction projects, and increases in construction worker traffic, impacting on traffic congestion and community perceptions of safety
- Increased demand for construction workers, providing benefits for workers, and potentially impacting on the availability of workers for other construction related projects or other industries across Sydney and elsewhere.

Where construction timeframes for projects occur sequentially, there is potential for disturbance and disruptions due to such things as construction noise, dust and construction traffic and access changes to occur over extended periods, potentially resulting in construction fatigue for some individuals. Extended periods of construction has the potential to exacerbate inconvenience or nuisance for some individuals and communities, or impact on health and wellbeing due to extended periods of sleep disturbance, stress and anxiety about potential impacts and changes from multiple projects, loss of access to formal and informal recreation areas, and possible loss of social connections due to extended periods of disruption to meeting places or access and connectivity. In relation to the project, this is likely to have the greatest impact on residents, businesses and communities closest to construction works at Rozelle, St Leonards and Cammeray due interaction with construction works for the M4-M5 Link at Rozelle, Beaches Link and Gore Hill Freeway Connection projects at St Leonards and Cammeray, and Sydney Metro Sydney Metro & City Southwest at St Leonards.

In particular, concurrent construction activities from multiple projects or consecutive construction of various projects has potential to result in cumulative impacts for communities located at:

- Rozelle, Lilyfield, Balmain and Pyrmont including residential receivers near the Rozelle Rail Yards and industrial and commercial receivers in the vicinity of White Bay and Glebe Island
- Residential receivers in Pyrmont, including cumulative noise and visual impacts as a result of concurrent construction activities in White Bay and Glebe Island
- Residential receivers at Waverton and McMahon's Point and Birchgrove associated with cumulative traffic impacts as a result of concurrent construction activities in White Bay and Glebe Island
- Commercial receivers in North Sydney CBD, residential receivers in Milsons Point and Kirribilli and regular users of the Warringah Freeway.

Overall, potential cumulative impacts associated with interaction of the project's construction with construction activities of other projects are expected to result in moderate impacts on community health and wellbeing and employment, and moderate-high impacts on local amenity and character, and access and connectivity.

Further detail regarding cumulative impacts during construction of the project, including construction fatigue, is provided in Chapter 27 (Cumulative impacts) of the environmental impact statement.

During operation, potential cumulative impacts would be associated with improved travel benefits for regional communities, business and industry, including freight, in the Sydney CBD road network.

As indicated in Section 6.2, in conjunction with the Beaches Link and Gore Hill Freeway Connection project, the project would also help to reduce traffic on arterial roads in the study area for example, Balmain Road/Darling Street, Victoria Road, Western Distributor, Bradfield Road and Cahill Expressway, supporting local environment and amenity improvements in the study area and surrounding region, and improved access and connectivity for residents, business and industry in the study area, northern and south-western suburbs and the Greater Sydney region.

Safeguards and management measures would be implemented for each project to manage the impacts of the individual projects. Coordination between the various projects in the planning of major works and possible disruptions, if possible, would assist in minimising potential cumulative impacts. Further discussion about the cumulative impacts of the project is provided in Chapter 27 (Cumulative impacts) of the environmental impact statement for the project.

6.10 Summary of impacts

Construction and operation of the project would have a range of positive and negative impacts on local communities, business and industries. Potential positive impacts would generally be associated with:

- Direct and indirect employment associated with the project's construction
- Positive changes to the business environment during construction within Catherine Street centre and Bay Road Waverton centre due to such things as increased passing trade, business visibility and demand for services
- Positive changes to the business environment during operation within local business centres due to such things as improved employee and customer access, servicing, delivery and distribution, character and amenity and business visibility
- Improved freight and efficiency costs for local business and industry
- Improved access and connectivity, including to employment areas and local and regional social infrastructure
- Reduced congestions and improved travel time and reliability, impacting positively on community cohesion, public transport access and access for local and regional communities and businesses.

Potential negative impacts of the project's construction on the socio-economic environment and communities within the study area are summarised in Table 6-6, while Table 6-7 summarises potential negative impacts of the project's operation. The significance of impacts was determined based on the methodology for assessing the sensitivity and magnitude of socio-economic impacts, provided in Section 2.1.2. A summary of the impacts of the project on businesses is provided in the business impact assessment report (refer to Appendix A).

Table 6-6 Construction impacts

| Element | Impact | Sensitivity | Magnitude | Significance |
|---------------------------|---|-------------|-----------|---------------|
| Property | Damage to properties above or near the tunnel | Low | Low | Low |
| | Uncertainty about potential property impacts | High | Low | Moderate |
| Equity | Changes to amenity for residents near surface works during construction | Moderate | Low | Moderate-low |
| Population and demography | Changes to population and demography from construction workforce and acquisition of residential properties | Low | Low | Low |
| Business impacts | Disruption to some maritime related businesses (including route timetables, access restrictions and amenity impacts) | Moderate | Moderate | Moderate |
| | Freight and efficiency construction issues (for example, efficiency of freight trips resulting in additional costs to businesses and reduced productivity) | Moderate | Moderate | Moderate |
| Social infrastructure | Temporary impact to land within Yurulbin Park, including disruptions to use of land for informal recreation activities such as walking and fishing (including access to Birchgrove Wharf) | High | Moderate | High-moderate |
| | Temporary impact on St Leonards Park, including temporary loss of access to and use of land within the construction footprint and disruption to the use of land for informal recreation | High | Moderate | High-moderate |
| | Temporary impact on grassed open space at ANZAC Park, temporarily disrupting the use of this land for informal recreation | Moderate | Low | Moderate-low |
| | Use of a portion of land at Cammeray Golf Course as a construction support site, including reconfiguration of the nine-hole golf course | Moderate | High | High-moderate |
| | Temporary impacts on Merlin Street Reserve, Rose Avenue Reserve, Jeaffreson Jackson Reserve and Anzac Avenue Reserve resulting in temporary loss of access to, and use of, open space within the construction footprint | Low | Low | Low |
| | Temporary impacts on the amenity at social infrastructure closest to surface works and construction support sites, including impacts from noise, vibration and dust | Moderate | Moderate | Moderate |
| | Temporary amenity impacts to James Milson Village, including impacts from noise, vibration and dust | High | Low | Moderate |
| | Impacts to social infrastructure located directly above the project alignment, including short-term vibration and ground-borne noise impacts | Low | Low | Low |

| Element | Impact | Sensitivity | Magnitude | Significance |
|-------------------------|---|-------------|------------|--------------|
| Community values | Temporary impacts on the amenity at some uses closest to surface works and construction support sites due to construction noise, dust, vibration and construction traffic | Moderate | Moderate | Moderate |
| | Disruption to people's use and enjoyment of meeting places such as parks and recreation facilities due to construction activities | Moderate | Low | Moderate-low |
| | Perceived impacts from increased dust on the health and wellbeing of groups within the community | Low | Low | Low |
| | Increased construction traffic along roads potentially impacting on perceptions of road safety | Low | Low | Low |
| Access and connectivity | Potential changes caused by road closures or diversions | Moderate | Moderate | Moderate |
| | Removal of parking spaces to allow for access to construction support sites and other construction activities and parking for the construction workforce | Moderate | Moderate | Moderate |
| | Potential delays and disruptions for bus services and changes to local bus services near construction works, including temporary relocation of some bus stops located close to construction support sites | Moderate | Low | Moderate-low |
| | Increased transit time for recreational, commercial and government vessels and navigational restrictions for larger vessels near to construction plant and equipment in the inner harbour | Moderate | Low | Moderate-low |
| | Impacts on maritime users and movements elsewhere in the harbour away from construction plant and equipment, including the outer harbour | Low | Negligible | Negligible |
| | Temporary closures, detours or other changes to pedestrian and cycle paths | Low | Low | Low |
| | Changes to property access for properties near to construction works | Negligible | Negligible | Negligible |

Table 6-7 Operation impacts

| Element | Impact | Sensitivity | Magnitude | Significance |
|-------------------------|--|-------------|------------|---------------|
| Property impacts | Acquisition of residential properties | High | Low | Moderate |
| | Potential impact on future development above the tunnel | Low | Negligible | Negligible |
| Business impacts | Full acquisition of properties accommodating business/industrial uses, resulting in the need for businesses to either relocate to another location or permanently close | Moderate | Moderate | Moderate |
| | Increased business costs associated with additional tolling expense should the government elect to introduce a northbound toll | Moderate | Low | Moderate-low |
| Social infrastructure | Strip acquisition of a small area of land within St Leonards Park and Anzac Avenue Reserve. Further design development may avoid the need for permanent acquisition of land within St Leonards Park.\ | Low | Low | Low |
| | Partial acquisition of Cammeray Golf Course and reconfiguration of the golf course | Moderate | High | Moderate-high |
| | Adverse noise and vibration impacts on users of social infrastructure closest to the project | Low | Low | Low |
| Community values | Potential for adverse changes to traffic noise levels for communities near tunnel connections and the Warringah Freeway. | Low | Low | Low |
| | Potential impacts to community cohesion due to the partial acquisition of Cammeray Golf Course | Moderate | Low | Moderate-low |
| | Perceived air quality impacts for residents and users of social infrastructure near ventilation facilities, such as Easton Park, Buruwan Park, ANZAC Park Public School, ANZAC Park, Cammeray Park, Cammeray-Neutral Bay Skate Park and Cammeray Tennis Club | Moderate | Negligible | Negligible |
| Access and connectivity | Potential impacts associated with localised delays at interchanges between the project and existing road infrastructure | Low | Negligible | Negligible |
| | Potential for localised increases in travel times during the busiest peak periods on some bus routes through North Sydney | Low | Low | Low |

7. Safeguards and management measures

This section provides an overview of the measures to manage the socio-economic impacts of the project's construction and operation. It provides an overview of the broad objectives for management of socio-economic impacts, as well as key strategies for addressing various issues.

7.1 Overview

Project-specific environmental management measures have been developed for the project with the aim of minimising or mitigating, as far as practical, potential socio-economic impacts of the project's construction and operation. These are described in Table 7-1.

Broadly, the expected environmental outcomes of the environmental management measures are to avoid or minimise impacts on communities, businesses and social infrastructure from the construction and operation of the project. These would be achieved through:

- Implementation of environmental management measures, for example noise, vibration and dust mitigation, and traffic management strategies
- Early and ongoing consultation and communication to ensure local and regional communities, businesses, transport users and managers of social infrastructure are informed about the project's construction and operation.

7.2 Socio-economic environmental management measures

Recommended safeguards and management measures to mitigate or manage socio-economic impacts of the project's construction and operation are summarised in Table 7-1. Additional measures relevant to the management of socio-economic impacts are also outlined in other chapters of the environmental impact statement, including:

- Chapter 8 (Construction traffic and transport)
- Chapter 9 (Operational traffic and transport)
- Chapter 10 (Construction noise and vibration)
- Chapter 11 (Operational noise and vibration)
- Chapter 12 (Air quality)
- Chapter 13 (Human health)
- Chapter 20 (Land use and property)
- Chapter 22 (Urban design and visual amenity).

Table 7-1 Summary of environmental management measures

| Ref | Impact | Environmental management measure | Location |
|--------------|-----------------------|--|----------|
| Construction | | | |
| SE1 | Social infrastructure | Where feasible and reasonable, the extent of permanent impact on public open space areas (for example, ANZAC Park, St Leonards Park, Cammeray Golf Course) will be minimised in further design development. | WHT/WFU |
| SE2 | | Parks, open space and sport and recreation areas impacted by construction and not required for permanent infrastructure will be reinstated and rehabilitated. | WHT/WFU |
| SE3 | | Ongoing engagement will be carried out with managers of social infrastructure located near to surface construction works/construction support sites and sensitive social infrastructure above the tunnel alignment (for example, schools, churches, aged care, child care, health and medical facilities) about the timing and duration of construction works and management of potential impacts. | WHT/WFU |
| BU1 | Businesses | Where businesses are affected by property acquisition, or lease cessation, the acquisition and compensation process will be implemented in line with the <i>Determination of compensation following the acquisition of a business guideline</i> . Compensation for a business conducted on land that is acquired will be determined in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> (NSW) as relevant. | WHT/WFU |
| BU2 | | Specific consultation will be carried out with businesses potentially impacted during construction. Consultation will aim to identify specific potential construction impacts for individual businesses. | WHT/WFU |
| BU3 | | Based on consultation with businesses, specific feasible and reasonable measures to maintain business access, visibility and parking and address other potential impacts as they arise through the construction process will be identified and implemented. A phone hotline that enables businesses to find out about the project or register any issues will be maintained. | WHT/WFU |

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Appendix A. Business impact assessment

Roads and Maritime Services

Western Harbour Tunnel and Warringah Freeway Upgrade

Technical working paper: Business impact assessment

January 2020

Prepared for

Roads and Maritime

Prepared by

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Glossary of terms and abbreviations

| Term | Definition |
|------------------------|--|
| A | |
| ABS | Australian Bureau of Statistics |
| Arterial roads | The main or trunk roads of the state road network that carry predominantly through traffic between regions |
| B | |
| BIA | Business Impact Assessment |
| Business ambience | The character and atmosphere of an environment in which a business is operating. |
| Business visibility | The exposure of a business storefront and signage/advertising to potential customers |
| C | |
| CBD | Central business district |
| Construction footprint | The construction footprint is the area required to construct the project. |
| CPI | Consumer price index |
| CPTED | Crime prevention through environmental design |
| Cumulative impacts | Impacts that, when considered together, have different or more substantial impacts than a single impact assessed on its own |
| D | |
| dB(A) | A-weighted decibels |
| DCP | Development Control Plan |
| DPIE | NSW Department of Planning, Industry and Environment |
| E | |
| Employee productivity | The efficiency of a worker or group of workers in terms of output and ability to carry out standard tasks over a specific period of time. |
| EP&A Act | <i>Environmental Planning and Assessment Act 1979</i> (NSW) |
| F | |
| G | |
| GCCSA | Greater Capital City Statistical Area |
| GIS | Geographical information systems |
| GRP | Gross Regional Product |
| GSC | Greater Sydney Commission |
| GSP | NSW Gross State Product |
| H | |
| Heavy vehicles | A heavy vehicle is classified as a Class 3 vehicle (a two-axle truck) or larger, in accordance with the Austroads Vehicle Classification System. |
| I | |
| Impact | Influence or effect exerted by a project or other activity on the natural, built and community environment. |
| Interchange | A grade separation of two or more roads with one or more interconnecting carriageways. |
| IVA | Industry Value Added |
| J | |
| Just Terms Act | <i>Land Acquisition (Just Terms Compensation) Act 1991</i> (NSW) |
| L | |

| Term | Definition |
|-----------------------------|---|
| LCZ | Landscape character zones |
| LEP | Local Environmental Plan |
| LGA | Local Government Area |
| Local road | A road or street used primarily for access to properties in that street |
| LoS | Level of service |
| M | |
| Motorway | Fast, high volume controlled access roads. May be tolled or untolled |
| M4-M5 Link | Including mainline tunnels and Rozelle Interchange of the M4-M5 Link |
| N | |
| NCA | Noise catchment area |
| P | |
| Passing trade | Pedestrians, cyclists and motorists who choose to patronise a business because they see it when walking/riding/driving past, not because they planned to go there |
| Portal | The entry and/or exit to a tunnel |
| Project | The Western Harbour Tunnel and Warringah Freeway Upgrade project |
| Project footprint | The land required to operate the project. This includes permanent operational infrastructure (including the tunnels) and land required temporarily for construction |
| Public transport | Includes train, bus (government and private), ferry (government and private) and light rail (government and private) services |
| R | |
| Roads and Maritime | Roads and Maritime Services |
| S | |
| SA1 | Statistical Area 1 (ABS) |
| SA2 | Statistical Area 2 (ABS) |
| SEARs | Secretary's environmental assessment requirements. Requirements and specifications for an environmental assessment prepared by the Secretary of the NSW Department of Planning, Industry and Environment (formerly Department of Planning and Environment) |
| SEIA | Socio-economic impact assessment |
| SEIFA | Socio-Economic Indexes for Areas |
| Sensitive receiver/receptor | Includes residences, educational institutions (including preschools, schools, universities, Technical and Further Education (TAFE) colleges, healthcare facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres, passive recreation areas (including outdoor grounds used for teaching), active recreation areas (including parks and sports grounds) and commercial premises (including film and television studios, research facilities, entertainment spaces, temporary accommodation such as caravan parks and camping grounds, restaurants, office premises, retail spaces and industrial premises) |
| SEPP | State Environmental Planning Policy |
| SREP | <i>Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005</i> |
| Service demand | Demand for services and resources providing direct or indirect employment or benefit from a project (eg for construction recruitment agencies and construction material suppliers) |
| Socio-economic | Involving combination of social and economic matters |
| Shared user path | Pathway shared by pedestrians and cyclists |
| Spoil | Surplus excavated material |
| Study area | Study area includes the construction footprint and operational footprint and other areas that may experience indirect impact |

| Term | Definition |
|----------------------|--|
| T | |
| U | |
| UDLP | Urban Design and Landscape Plan |
| Urban design | The process and product of designing human settlements, and their supporting infrastructure, in urban and rural environments |
| V | |
| Ventilation facility | Facility for the mechanical removal of air from the main alignment tunnels, or mechanical introduction of air into the tunnels |
| Ventilation outlet | The location and structure from which air within a tunnel is expelled |
| W | |
| X | |
| Y | |
| Z | |

EXECUTIVE SUMMARY

Roads and Maritime Services (Roads and Maritime) is seeking approval under Division 5.2, Part 5 of the Environmental Planning and Assessment Act 1979 to construct and operate the Western Harbour Tunnel and Warringah Freeway Upgrade (the project), which would comprise two main components:

- A new crossing of Sydney Harbour involving twin tolled motorway tunnels connecting the M4-M5 Link at Rozelle and the existing Warringah Freeway at North Sydney (the Western Harbour Tunnel)
- Upgrade and integration works along the existing Warringah Freeway, including infrastructure required for connections to the Beaches Link and Gore Hill Freeway Connection project (the Warringah Freeway Upgrade).

This report identifies and assesses the business impacts that may result from the project during construction and operation. This report considers the direct, indirect and cumulative impacts on businesses, including evaluating the significance of impacts and required mitigation strategies to minimise any adverse impacts and maximise the benefits of the project. In doing so, it responds directly to the Secretary's environmental assessment requirements (SEARs).

In particular, the SEARs require:

- Meaningful and effective engagement with businesses during project design and delivery
- Assessment of the operational transport impacts of the project including property and business access and street parking
- Assessment of the impacts from construction and operation on potentially affected businesses.

Important note

This document considers impacts on local businesses along the Western Harbour Tunnel and Warringah Freeway Upgrade project corridor. The findings should not be conflated with the economic appraisal of the Western Harbour Tunnel Beaches Link program of works, which considers the wider economic impact of the program to the state of New South Wales.

The project

Key construction activities with the potential to impact on businesses are:

- Early works and site establishment
- Construction of Western Harbour Tunnel
- Construction of operational facilities including a motorway control centre at Waltham Street in Artarmon, motorway and tunnel support facilities and ventilation outlets at the Warringah Freeway in Cammeray, construction and fitout of the project operational facilities that form part of the M4-M5 Link Rozelle East Motorway Operations Complex, a wastewater treatment plant at Rozelle and the installation of motorway tolling infrastructure
- Construction of the Warringah Freeway Upgrade
- Testing of plant and equipment, and commissioning of the project.

Once operational, the project has the potential to alter travel patterns with a long-term change in network efficiency anticipated. This would have impacts on freight and commercial vehicle movements as well as employee and customer access for locations both within the study area and further afield, creating direct business cost efficiencies and improving productivity.

Study area

The study area for this assessment includes those businesses and local business centres that may experience changes to existing conditions due to the location of the project, construction activities and changes in movement patterns for business owners, workers and customers. The study area comprises the Australian Bureau of Statistics (ABS) Statistical Areas Level 2 (SA2) geographies that are affected by or are located near the project and the section of Sydney Harbour adjacent to the project alignment.

For the purposes of this assessment, the study area has been divided into two 'precincts' located north and south of Sydney Harbour. The SA2s that were affected by, or were in close proximity to the project footprint defined the study area to include:

- South Harbour Precinct:
 - Leichhardt–Annandale
 - Lilyfield–Rozelle
 - Balmain.
- North Harbour Precinct
 - North Sydney–Lavender Bay
 - Neutral Bay–Kirribilli
 - Crows Nest–Waverton
 - Cremorne–Camberay
 - Mosman
 - St Leonards–Naremburn.

Some benefits and impacts would also be experienced by businesses in the wider region. As such, the assessment considered potential impacts on the surrounding local government areas and the Greater Sydney region at a broader level.

Business centres

The existing business environment of the study area has been reviewed and businesses in centres have been consulted to understand sensitivities and dependencies. HillPDA engaged with businesses through a survey, conducted over a three-week period in November 2017. Businesses were approached at random with over 182 businesses participating in the survey.

The study area includes a diversity of centres ranging from local centres to larger strategic centres. Catherine Street and Victoria Road/Darling Street are smaller retail centres in the South Harbour Precinct. Robert Street Industrial, James Craig Road and Chapman Road centres are more industry-oriented. In the North Harbour Precinct, the North Sydney CBD forms part of the Harbour CBD metropolitan area. St Leonards is a large strategic centre, providing a mix of commercial, retail, health and education services. Along with the Artarmon industrial centre, these centres are large generators of economic productivity and employment. There are a number of local centres in the Northern Harbour Precinct, with Miller Street, Cammeray, Kirribilli, Neutral Bay Junction, Military Road Cremorne, Bay Road Waverton and St Leonards–Crows Nest all identified as being potentially affected by the project.

In total, the study area contains 25,102 businesses, providing in the order of 127,282 jobs.

Scoping

Scoping identified a broad range of potential impacts that could arise from the project with the capacity to directly or indirectly affect the operation or revenue capacity of businesses. This included potential impacts, either beneficial and negative, passing trade, employee and customer access, servicing and delivery, character and amenity, employee productivity, business visibility and demand for goods and services. Effects such as the impact of tolling and alterations in trade catchments were also identified.

Business perceptions

Engagement with business operators found that businesses in the area have varying degrees of sensitivity and dependency to the potential impacts that are outlined above.

Generally, there was a high dependency (75 per cent) on vehicular passing trade, with 43 per cent of businesses surveyed being majorly dependent. Eighty-four per cent of surveyed businesses perceived a dependency on pedestrian and cyclist passing trade, with 66 per cent of these being majorly dependent. In response to these findings, changes in traffic, pedestrian and cycle movements have been given detailed consideration in the assessment of business impacts.

Changes in access to a centre, for example through congestion and changes in travel times, may result in long-term changes to consumer and worker behaviour. The business survey found that 80 per cent of businesses believed that they were sensitive to travel time delays, with 45 per cent of the respondents believing themselves to be majorly sensitive.

The majority of customers and employees were said to use private vehicles as their primary transport mode. Sixty four per cent of businesses surveyed believed the construction phase of the project would have no discernible positive or negative effects on travel time and access. However, 50 per cent of business respondents believed that, once operational, the project would positively impact employee and customer access.

Convenient customer parking was considered a dependency for 74 per cent of businesses, with 54 per cent of respondents indicating a major dependency on convenient customer parking. The majority of businesses (84 per cent) were dependent on on-street parking, with 63 per cent of these businesses recording major dependencies.

The potential for the project to impact on deliveries and loading arrangements was also considered. However, the impact was considered by businesses to be neutral or positive, with 64 per cent of businesses believing construction would have a neutral effect and about 47 per cent stating that the operation of the project would have a positive effect on servicing and delivery.

The potential for reduced exposure was considered, with 91 per cent of businesses identifying that they are dependent on business exposure and visibility and 62 per cent majorly dependent. Miller Street, Cammeray, Military Road, North Sydney, Spit Junction and Victoria Road/Darling Street were the surveyed business centres that recorded the highest dependencies.

Changes to the local character and amenity of a place can affect the enjoyment and desirability of the environment, visitor numbers and trends, and consequently the economic activity of a commercial centre and the businesses located there. Overall, 80 per cent of businesses identified that they were dependent on the identity and character of the commercial centre they were located in, with 43 per cent being majorly dependent. Sixty-five per cent identified that they were dependent on a pleasant visual amenity, 18 per cent had a high sensitivity to noise, 39 per cent had a high sensitivity to air quality and 37 per cent had a high sensitivity to odour.

Overall, the business survey indicated that the majority of businesses believed the project would have a neutral effect on demand for goods and services. The findings of the business survey assisted in determining the sensitivity of businesses and their ability to adapt and respond to project-related changes to the socio-economic environment.

Impact assessment

The potential impacts on businesses in each centre have been assessed with regard for the sensitivity of businesses and business centres to project changes and to changes in traffic and pedestrian movements (see Table E-1).

The methodology used for the assessment requires that only negative impacts are assigned a level of significance. The potential negative impacts have been reported for each centre, assessed as Negligible, Low, Moderate and High against sensitivity and magnitude.

Positive social and economic impacts and opportunities have only been qualitatively discussed and assessed.

The assessment was informed by information provided in project technical working papers, the business survey, knowledge of the existing environment and professional judgement.

The impact assessment identifies and evaluates changes to the business environment and industry condition arising from construction and operation of the project.

Table E-1: Potential impacts on business revenue and operation

| Project phase | Potential positive impacts on business revenue and operation | Potential negative impacts on business revenue or operation |
|---------------|---|---|
| Construction | <ul style="list-style-type: none"> • Increase in passing trade and potential sales at Catherine Street, Victoria Road/Darling Street, North Sydney, Bay Road, Waverton and Artarmon Industrial • Increase in business visibility at Catherine Street, Victoria Road/Darling Street, James Craig Road working waterfront, Miller Street, North Sydney, Kirribilli centre, and Bay Road, Waverton • Increased demand for services due to increased construction workers at all locations except Chapman Road working waterfront, St Leonards–Crows Nest and Military Road, Cremorne. | <ul style="list-style-type: none"> • Property acquisitions and lease cessations (only where absolutely necessary) to enable construction • Effect on customer or employee travel time and access particularly around Victoria Road/Darling Street, James Craig Road working waterfront, Chapman Road working waterfront, North Sydney and Neutral Bay Junction • Increase in freight and commercial vehicle travel time and distance due to minor diversions and delays • Reduction in service and delivery efficiency, with businesses at Victoria Road/Darling Street, North Sydney, Kirribilli and Neutral Bay Junction being most susceptible to these changes • Reduced centre amenity and character with the centres of Victoria Road/Darling Street, North Sydney and Artarmon Industrial marginally more susceptible • Minor maritime operation inefficiencies. |

| Project phase | Potential positive impacts on business revenue and operation | Potential negative impacts on business revenue or operation |
|---------------|---|---|
| Operation | <ul style="list-style-type: none"> Substantial improvements in network travel time and connectivity Substantial improvements to employee and customer access across the network Improved passing trade and potential sales at Victoria Road/Darling Street and Neutral Bay Junction Improved servicing and delivery capacity across most centres Improved character and amenity in Victoria Road/Darling Street Improved business visibility for James Craig working waterfront Improved demand for services across most centres Greater connectivity to other employment centres Increased potential for new and repeat customers with expanded trade catchments. | <ul style="list-style-type: none"> Localised alterations and delays in the traffic and transport environment in North Sydney affecting some employee and customer access and servicing and delivery for a small number of businesses. Travel time delays would be offset by the substantial improvements from the broader network connections. While no decision on tolls has yet been made, provision has been made in the design for new toll gantries on northbound locations of the Sydney Harbour Bridge and Sydney Harbour Tunnel, should the Government elect to apply northbound tolls to these crossings. If northbound tolls were applied, the introduction of tolling would present a discernible change costing individuals and businesses. |

Overall, the significance of project construction impacts on businesses is considered to be low, with any impacts (positive or negative) more likely to be experienced at an individual business level. Key potential benefits include increased passing trade, business visibility and demand for services. While there may be temporary impacts on some businesses during construction, including employee and customer access, servicing and delivery, there is not expected to be a lasting impact on any of the centres once construction ceases.

Some businesses may be subject to potential cumulative impacts from multiple projects, including in some areas of Darling Street/Victoria Road Rozelle, James Craig Road and Chapman Road working waterfront, Robert Street industrial centre and North Sydney. This would be from extended periods of construction affecting traffic and local amenity, potentially causing construction fatigue. Some businesses may benefit from the continued presence of construction workers with ongoing passing trade, business visibility and demand for services.

Once operational, the project is expected to deliver long-term benefits to businesses within the study area and further afield. It is considered that the project would be beneficial for employee and customer access, servicing, delivery and demand for services across most centres. Some centres would also benefit from improvements in passing trade, character and amenity and business visibility.

The project would deliver significant improvements to the capacity and reliability of the critical cross harbour road corridors near the CBD. The improvement in the efficiency of the transport network and enhanced connectivity between certain areas has the capacity to increase connectivity for employees and customers and enhance the efficiency of freight and commercial vehicle movements. Enhancements to the freight and commercial vehicle network is expected to have follow-on benefits to local businesses with improved transport times increasing productivity and reducing costs. Once operational, the project, alongside other major transport projects, is expected to deliver beneficial cumulative impacts for businesses. These include:

- Supporting Sydney's long-term economic and employment growth, through improved transport connectivity to key employment areas across the city
- Alleviating congestion and contributing to improved connectivity, speeds, reliability and safety of the broader road network, which is of importance to the contribution and efficiencies of the freight industry

- Generating economic benefits to businesses through reduced operational expenses and opportunity for increased revenues
- Improved business centre viability and regeneration opportunity as a result of new connections
- Improved connections across the network, enhancing accessibility for customers and employees and creating greater opportunity for business synergies.

The construction phase of the project would potentially impact a larger number of business centres than what is identified in the operational phase. The impacts during construction are generally short term and intermittent in nature and would unlikely have lasting effects of business viability. Once operational, businesses would retain a high ability to absorb and adapt to the change and would likely continue operating as normal.

Management measures

To mitigate and manage the potential impacts of the project during construction and operation, a range of management measures have been identified, including ongoing consultation with businesses, measures to maintain business access, visibility and parking, and a hotline to find out information and register issues. The intent of these measures is to maximise communication with businesses and develop feasible and reasonable measures to assist in alleviating adverse effects. Where businesses are affected by property acquisition or lease cessation, a process would be implemented in line with the *Determination of compensation following the acquisition of a business* guide (NSW Government, n.d.). Prior to construction, consideration will be given to the amenity of adjacent areas.

1.0 INTRODUCTION

This section provides an overview of the Western Harbour Tunnel and Warringah Freeway Upgrade (the project), including its key features and location. It also outlines the Secretary's environmental assessment requirements addressed in this technical working paper.

1.1 Overview

The Greater Sydney Commission's *Greater Sydney Region Plan – A Metropolis of Three Cities* (Greater Sydney Commission, 2018) proposes a vision of three cities where most residents have convenient and easy access to jobs, education and health facilities and services. In addition to this plan, and to accommodate for Sydney's future growth the NSW Government is implementing the *Future Transport Strategy 2056* (Transport for NSW, 2018), a plan that sets the 40 year vision, directions and outcomes framework for customer mobility in NSW. The Western Harbour Tunnel and Beaches Link program of works is proposed to provide additional road network capacity across Sydney Harbour and to improve transport connectivity with Sydney's northern beaches. The Western Harbour Tunnel and Beaches Link program of works include:

- The Western Harbour Tunnel and Warringah Freeway Upgrade project which comprises a new tolled motorway tunnel connection across Sydney Harbour, and an upgrade of the Warringah Freeway to integrate the new motorway infrastructure with the existing road network and to connect to the Beaches Link and Gore Hill Freeway Connection project
- The Beaches Link and Gore Hill Freeway Connection project which comprises a new tolled motorway tunnel connection across Middle Harbour from the Warringah Freeway and Gore Hill Freeway to Balgowlah and Killarney Heights and including the surface upgrade of Wakehurst Parkway from Seaforth to Frenchs Forest and upgrade and integration works to connect to the Gore Hill Freeway at Artarmon.

A combined delivery of the Western Harbour Tunnel and Beaches Link program of works would unlock a range of benefits for freight, public transport and private vehicle users. It would support faster travel times for journeys between the Northern Beaches and south, west and north-west of Sydney Harbour. Delivering the program of works would also improve the resilience of the motorway network, given that each project provides an alternative to heavily congested harbour crossings.

1.2 The project

Roads and Maritime Services (Roads and Maritime) is seeking approval under Division 5.2, Part 5 of the *Environmental Planning and Assessment Act 1979* to construct and operate the Western Harbour Tunnel and Warringah Freeway Upgrade, which would comprise two main components:

- A new crossing of Sydney Harbour involving twin tolled motorway tunnels connecting the M4-M5 Link at Rozelle and the existing Warringah Freeway at North Sydney (the Western Harbour Tunnel)
- Upgrade and integration works along the existing Warringah Freeway, including infrastructure required for connections to the Beaches Link and Gore Hill Freeway Connection project (the Warringah Freeway Upgrade).

Key features of the Western Harbour Tunnel component of the project are shown in Figure 1-1 and would include:

- Twin mainline tunnels about 6.5 kilometres long and each accommodating three lanes of traffic in each direction, connecting the stub tunnels from the M4-M5 Link at Rozelle to the Warringah Freeway and to the Beaches Link mainline tunnels at Cammeray. The crossing of

Sydney Harbour between Birchgrove and Waverton would involve a dual, three lane, immersed tube tunnel

- Connections to the stub tunnels at the M4-M5 Link project in Rozelle and to the mainline tunnels at Cammeray (for a future connection to the Beaches Link and Gore Hill Freeway Connection project)
- Surface connections at Rozelle, North Sydney and Cammeray, including direct connections to and from the Warringah Freeway (including integration with the Warringah Freeway Upgrade), an off ramp to Falcon Street and an on ramp from Berry Street at North Sydney
- A ventilation outlet and motorway facilities (fitout and commissioning only) at the Rozelle Interchange
- A ventilation outlet and motorway facilities at the Warringah Freeway in Cammeray
- Operational facilities including a motorway control centre at Waltham Street, within the Artarmon industrial area and tunnel support facilities at the Warringah Freeway in Cammeray
- Other operational infrastructure including groundwater and tunnel drainage management and treatment systems, signage, tolling infrastructure, fire and life safety systems, lighting, emergency evacuation and emergency smoke extraction infrastructure, CCTV and other traffic management systems.

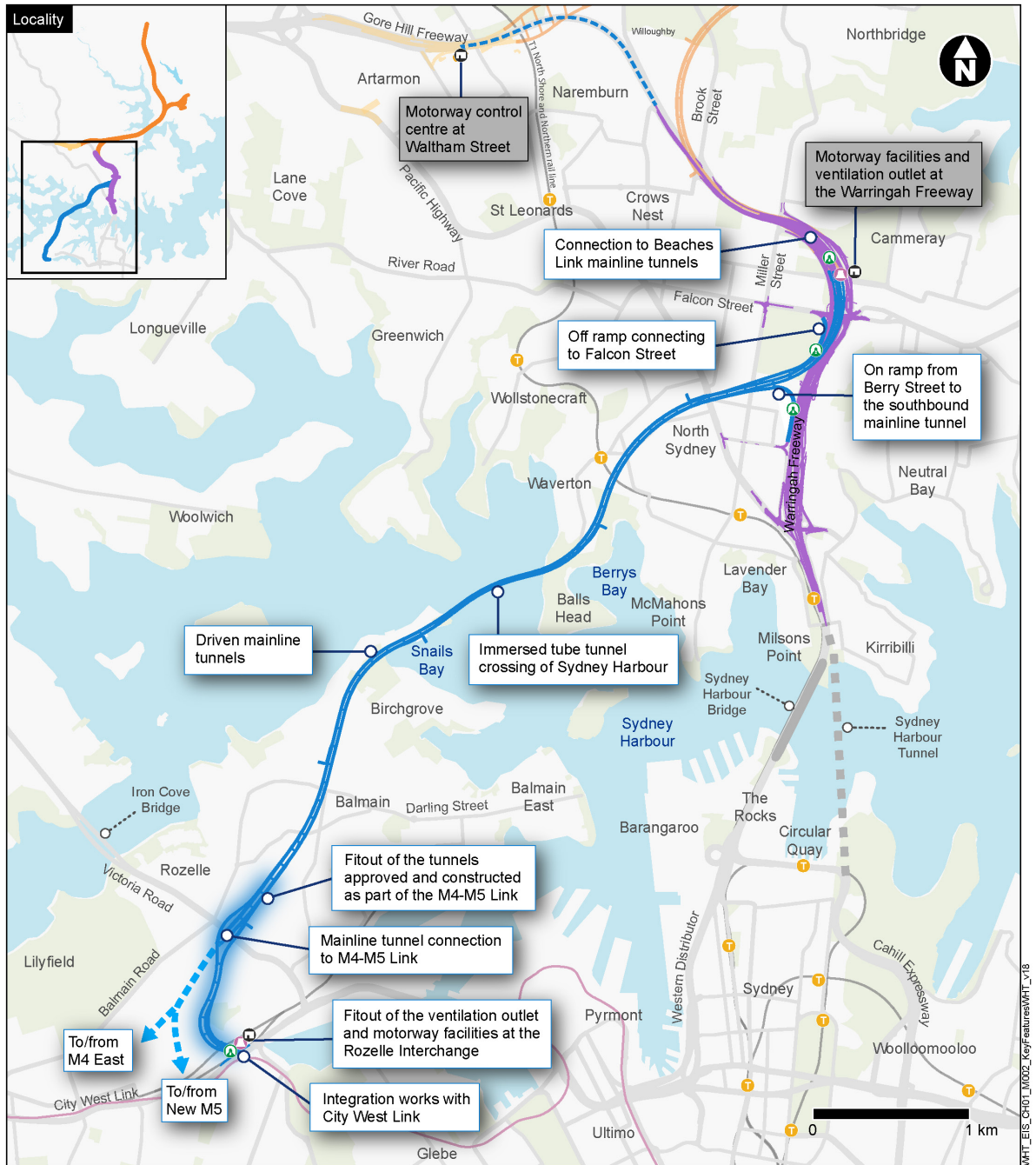
Key features of the Warringah Freeway Upgrade component of the project are shown in Figure 1-2 and would include:

- Upgrade and reconfiguration of the Warringah Freeway from immediately north of the Sydney Harbour Bridge through to Willoughby Road at Naremburn
- Upgrades to interchanges at Falcon Street in Cammeray and High Street in North Sydney
- New and upgraded pedestrian and cyclist infrastructure
- New, modified and relocated road and shared user bridges across the Warringah Freeway
- Connection of the Warringah Freeway to the portals for the Western Harbour Tunnel mainline tunnels and the Beaches Link tunnels via on and off ramps, which would consist of a combination of trough and cut and cover structures
- Upgrades to existing roads around the Warringah Freeway to integrate the project with the surrounding road network
- Upgrades and modifications to bus infrastructure, including relocation of the existing bus layover along the Warringah Freeway
- Other operational infrastructure, including surface drainage and utility infrastructure, signage, tolling, lighting, CCTV and other traffic management systems.

A detailed description of the project is provided in Chapter 5 (Project description) and construction of the project is described in Chapter 6 (Construction work) of the environmental impact statement. The project alignment at the Rozelle Interchange shown in Figure 1-1 and Figure 1-3 reflects the arrangement presented in the environmental impact statement for the M4-M5 Link, and as amended by the proposed modifications. The project would be constructed in accordance with the now finalised M4-M5 Link detailed design (refer to Section 2.1.1 of Chapter 2 (Assessment process) of the environmental impact statement for further details).

The project does not include ongoing motorway maintenance activities during operation or future use of residual land occupied or affected by project construction activities, but not required for operational infrastructure. These would be subject to separate planning and approval processes at the relevant times.

Subject to the project obtaining planning approval, construction is anticipated to commence in 2020 and is expected to take around six years to complete.



Legend

Operational features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- - - Communications cable for motorway control centre
- M4-M5 Link tunnel fitout and commissioned as part of Western Harbour Tunnel

- A Surface connection
- P Permanent operational facility
- V Ventilation outlet

Connecting projects

- Beaches Link
- Gore Hill Freeway Connection
- - - M4-M5 Link connections (indicative)

Existing rail network

- Heavy rail
- Light rail
- T Train station

Figure 1-1: Key features of the Western Harbour Tunnel component of the project

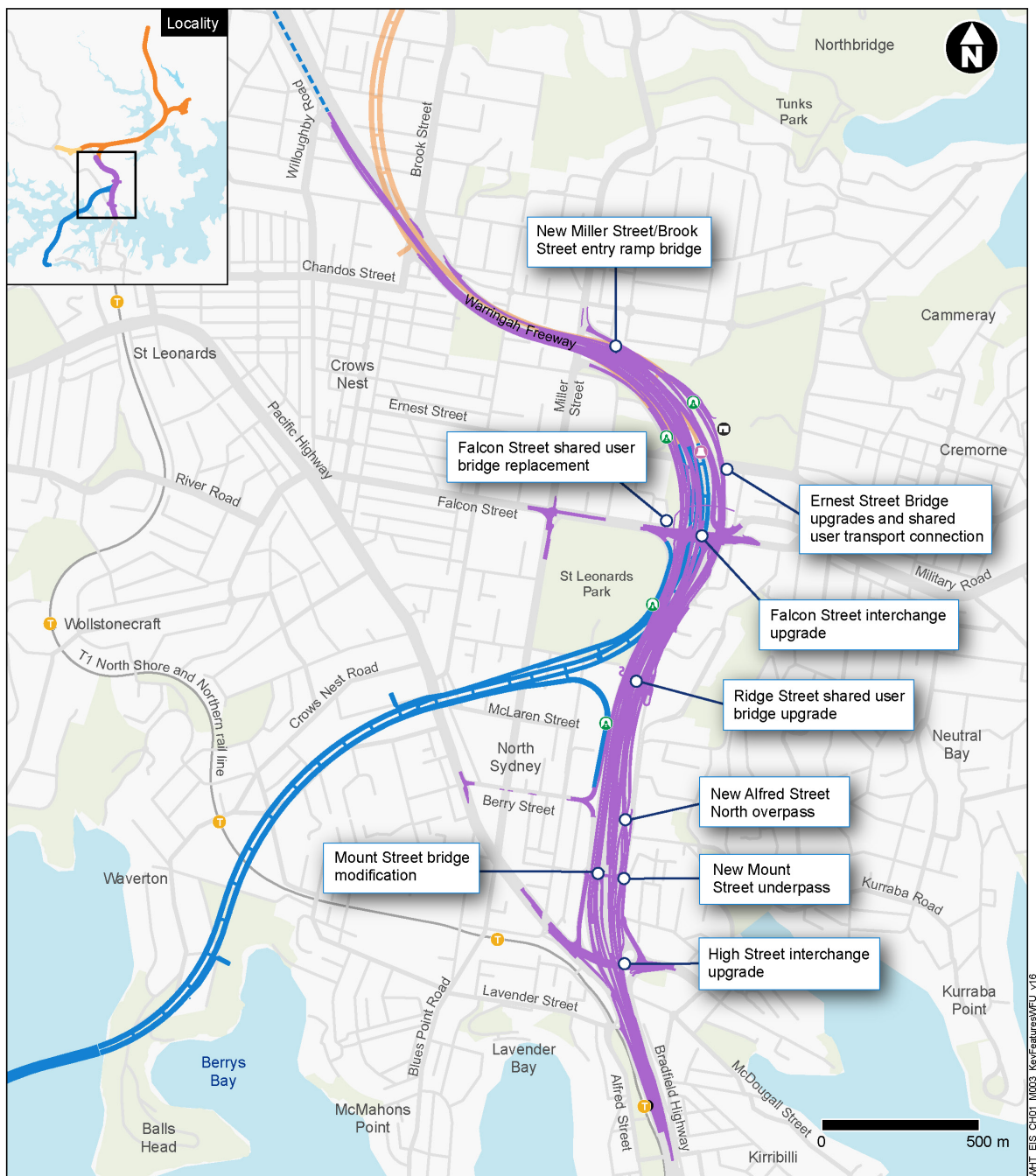


Figure 1-2: Key features of the Warringah Freeway Upgrade component of the project

1.3 Key construction activities

The area required to construct the project is referred to as the construction footprint. The majority of the construction footprint would be located underground within the mainline tunnels. However, surface areas would be required to support tunnelling activities and to construct the tunnel connections, tunnel portals and operational ancillary facilities.

Key construction activities would include:

- Early works and site establishment, with typical activities being property acquisition and condition surveys, utilities installation, protection, adjustments and relocations, installation of site fencing, environmental controls (including noise attenuation and erosion and sediment control) and traffic management controls, vegetation clearing, earthworks and demolition of structures, establishment of construction support sites including acoustic sheds and associated access decline acoustic enclosures (where required), construction of minor access roads and the provision of property access, temporary relocation of pedestrian and cycle paths and bus stops, temporary relocation of swing moorings within Berrys Bay and relocation of historic vessels and establishment of construction support sites
- Construction of Western Harbour Tunnel, with typical activities being excavation of tunnel construction accesses, construction of driven tunnels, cut and cover and trough structures and construction of cofferdams, dredging activities in preparation for the installation of immersed tube tunnels, casting and installation of immersed tube tunnels and civil finishing and tunnel fitout
- Construction of operational facilities comprising of a motorway control centre at Waltham Street in Artarmon, motorway and tunnel support facilities and ventilation outlets at the Warringah Freeway in Cammeray, construction and fitout of the project operational facilities that form part of the M4-M5 Link Rozelle East Motorway Operations Complex, a wastewater treatment plant at Rozelle and the installation of motorway tolling infrastructure
- Construction of the Warringah Freeway Upgrade, with typical activities being earthworks, bridgeworks, construction of retaining walls, stormwater drainage, pavement works and linemarking and the installation of road furniture, lighting, signage and noise barriers
- Testing of plant and equipment, and commissioning of the project, backfill of access declines, removal of construction support sites, landscaping and rehabilitation of disturbed areas and removal of environmental and traffic controls.

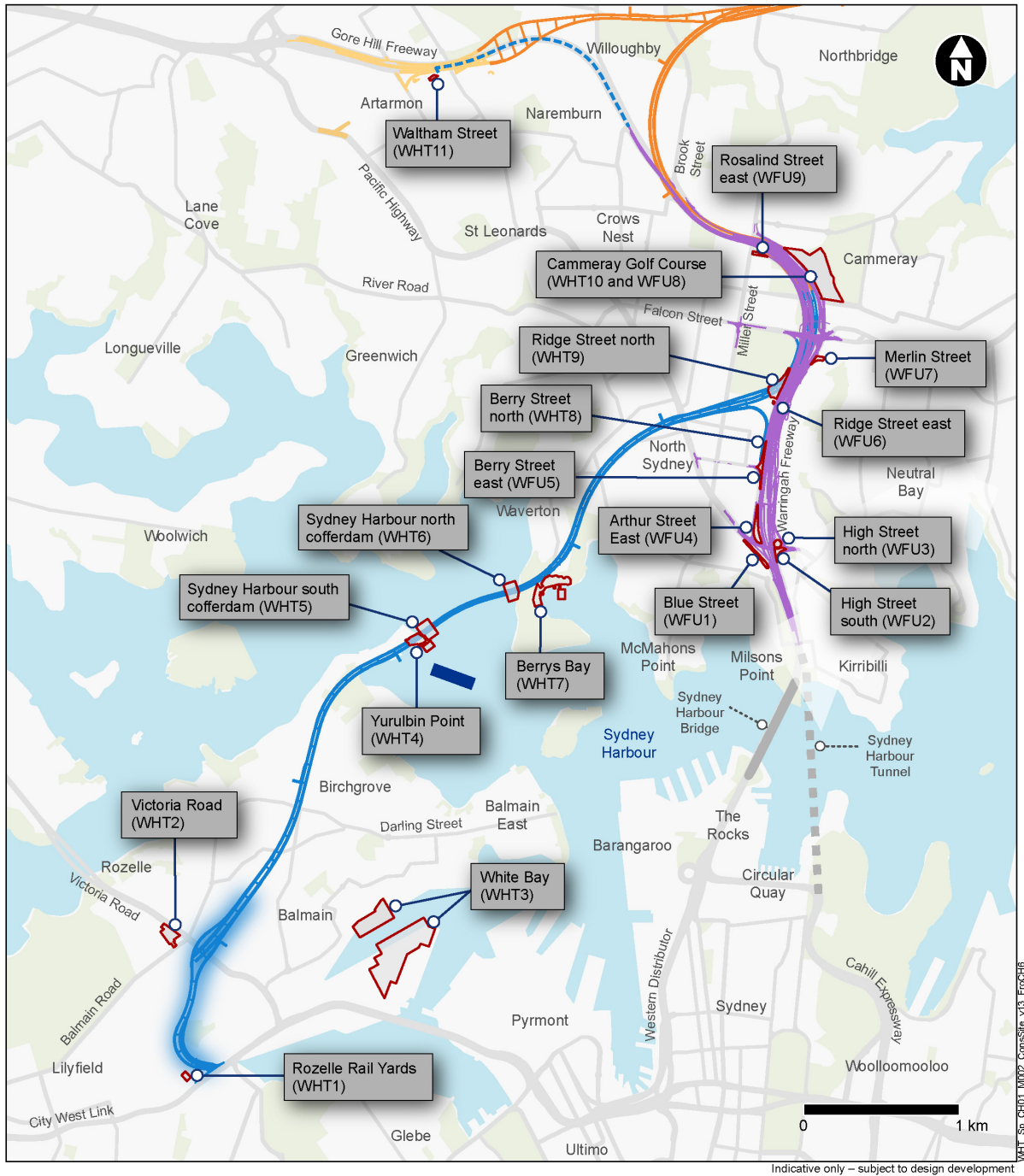
Temporary construction support sites would be required as part of the project (refer to Figure 1-3), and include tunnelling and tunnel support sites, civil surface sites, cofferdams, mooring sites, wharf and berthing facilities, laydown areas, parking and workforce amenities. Construction support sites for Western Harbour Tunnel would include:

- Rozelle Rail Yards (WHT1)
- Victoria Road (WHT2)
- White Bay (WHT3)
- Yurulbin Point (WHT4)
- Sydney Harbour south cofferdam (WHT5)
- Sydney Harbour north cofferdam (WHT6)
- Berrys Bay (WHT7)
- Berry Street north (WHT8).
- Ridge Street north (WHT9)
- Cammeray Golf Course (WHT10)
- Waltham Street (WHT11).

During the construction of the Warringah Freeway Upgrade, smaller construction support sites would be required to support the construction works (as shown on Figure 1-3). These include:

- Blue Street (WFU1)
- High Street south (WFU2)
- High Street north (WFU3)
- Arthur Street east (WFU4)
- Berry Street east (WFU5)
- Ridge Street east (WFU6)
- Merlin Street (WFU7)
- Cammeray Golf Course (WFU8)
- Rosalind Street east (WFU9).

A detailed description of construction works for the project is provided in Chapter 6 (Construction work) of the environmental impact statement.



Legend

Construction features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Communications cable for motorway control centre
- Fit out and commissioned as part of Western Harbour Tunnel, constructed as part of WestConnex M4-M5 Link

- Construction support sites
- Mooring site

Connecting projects

- Beaches Link
- Gore Hill Freeway Connection

Figure 1-3: Overview of construction support sites

1.4 Project location

The project would be located within the Inner West, North Sydney and Willoughby local government areas, connecting Rozelle in the south with Naremburn in the north.

Commencing at the Rozelle Interchange, the mainline tunnels would pass under Balmain and Birchgrove, then cross Sydney Harbour between Birchgrove and Balls Head. The tunnels would then continue under Waverton and North Sydney, linking directly to the Warringah Freeway to the north of the existing Ernest Street bridge.

The motorway control centre is proposed to be located at Waltham Street, Artarmon, with a trenched communications cable connecting the motorway control centre to the Western Harbour tunnel along the Gore Hill Freeway and Warringah Freeway road reserves.

The Warringah Freeway Upgrade would be carried out on the Warringah Freeway from around Fitzroy Street at Milsons Point to around Willoughby Road at Naremburn. Upgrade works would include improvements to bridges across the Warringah Freeway and upgrades to surrounding roads.

1.5 Purpose of this report

This report has been prepared to support the environmental impact statement for the project and to address the environmental assessment requirements of the Secretary of the Department of Planning, Industry and Environment (formerly Department of Planning and Environment) ('the Secretary's environmental assessment requirements').

This report identifies and assesses the business impacts that may result from the project during construction and operation. This report considers the direct, indirect and cumulative impacts on businesses, including evaluating the significance of impacts and required mitigation strategies to minimise adverse impacts and maximise benefits of the project. In doing so, it responds directly to the Secretary's environmental assessment requirements as outlined in section 1.6. To inform the change to the existing environment, the report relies on information provided by Roads and Maritime and various technical specialist reports.

This report is one of a number of technical documents that form part of the Western Harbour Tunnel and Warringah Freeway Upgrade. Technical working paper: Socio-economic assessment (Jacobs, 2020) can be referred to for the assessment of the direct and indirect impacts on the social and economic environment, including residents, social infrastructure users, motorists and the economy.

1.6 Secretary's environmental assessment requirements

The Secretary's environmental assessment requirements relating to this assessment and where these requirements are addressed in this report are outlined in Table 1-1.

Table 1-1: Secretary's environmental assessment requirements – business impacts

| Desired performance outcome | Requirement | Where addressed |
|---|---|---|
| Consultation The project is developed with meaningful and effective engagement during project design and delivery. | The project must be informed by consultation, including with relevant local, State and Commonwealth government agencies (including the Harbour Master where disturbance of seabeds, shipping channel closures or marine movement of materials/spoil are proposed), infrastructure and service providers, special interest groups (including Local Aboriginal Land Councils, Aboriginal stakeholders, and pedestrian and bicycle user groups), affected landowners, businesses and the community. | Section 2.4 – Business survey approach including consultation with businesses Appendix A – Business survey Appendix B – Business survey report Chapter 7 (Stakeholder and community engagement) of the environmental impact statement |
| Transport and traffic | The Proponent must assess and model the operational transport impacts of the project including but not necessarily limited to: (h) property and business access and on-street parking | Section 6 assesses the impact on businesses from changes to access and on-street parking upon operation. Technical working paper: Traffic and transport (Jacobs, 2020) |
| Socio-economic, land use and property The project minimises impacts on property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure. | 1. The Proponent must assess social and economic impacts (of all phases of the project) in accordance with the current guidelines (including cumulative construction and operational impacts of the proposal and other major projects in the vicinity of the project) and in consultation with relevant land owners (such as the Ports Authority of NSW and those land owners whose property is being acquired). 2. The Proponent must assess impacts from construction and operation on potentially affected properties, businesses, recreational users and land and water users (including potential cumulative impacts associated with use of Glebe Island and White Bay in consideration of other major developments in the precinct), amenity impacts (including from cumulative and extended construction time frames and construction fatigue), property acquisitions/adjustments, future land uses, access, relevant statutory rights, and community severance and barrier impacts resulting from the project. | Section 5 – Construction impacts Section 6 – Operation impacts Section 7 – Cumulative impacts Section 5 – Maritime impacts EIS Technical working paper: Socio-Economic Assessment (Jacobs, 2020) EIS report Chapter 18 Land Use and Property |

1.7 Structure of this report

The remainder of this report is structured as follows:

- **Section 2:** Describes the methods of assessment employed for the business impact assessment
- **Section 3:** Describes the existing commercial environment within the study area including identifying business types, characteristics, sensitivities and dependencies
- **Section 4:** Scopes business issues by evaluating the perception of businesses as identified in the business survey
- **Section 5:** Evaluates the potential impacts on business and industry resulting from construction of the project

- **Section 6:** Evaluates the potential impacts on business and industry resulting from operation of the project
- **Section 7:** Evaluates the potential cumulative impacts on business
- **Section 8:** Identifies management and mitigation measures to reduce the negative or enhance the positive effects of the project
- **Section 9:** References
- **Appendix A:** Business survey
- **Appendix B:** Business survey report.

2.0 ASSESSMENT METHODOLOGY

2.1 Methodology overview

This business impact assessment methodology has been developed according to the SEARs and relevant components of the Roads and Maritime *Socio-economic Assessment Practice Note EIA-N05* (Roads and Maritime 2013).

The business impact assessment is informed by the outcomes of the various technical working papers that have been prepared for the project environmental impact statement. This includes Technical working paper: Air quality (ERM, 2020), Technical working paper: Traffic and transport (Jacobs, 2020), Technical working paper: Noise and vibration (Renzo Tonin, 2020), Technical working paper: Urban design, landscape character and visual impact assessment (Arup, 2020) and Technical working paper: Socio-economic assessment (Jacobs, 2020). In consideration of the results of the technical working papers and the outcomes of consultation with businesses, a comprehensive assessment of construction and operation impacts on businesses has been prepared in accordance with the Roads and Maritime (2013) Practice Note.

In preparing the business impact assessment, the following process was implemented:

1. Review of assessments for similar projects to scope issues and identify the potential scale and magnitude of impacts
2. Definition of the study area (refer to section 2.2)
3. Development of the existing profile of business and industry characteristics within the study area and the geographic and aesthetic environment present
4. Review of strategic planning and policy documents to determine the existing and future proposed characteristics of the study area
5. Survey of businesses and review of characteristics, values and sensitivities raised during these business surveys
6. Identification of likely changes/impacts that may occur as a result of the project, including specific effects on business and industry
7. Assessment of the significance of business impacts during construction and operation
8. Assessment of cumulative business impacts
9. Identification of management measures, plans and strategies for monitoring and managing the impacts during both construction and operation.

2.2 Defining the study area

The study area for this assessment includes those businesses and local business centres that may experience changes to existing conditions due to the location of the project, construction activities and changes in movement patterns for business owners, workers and customers. The study area is shown in Figure 2-1 and Figure 2-2. It comprises the Australian Bureau of Statistics (ABS) Statistical Areas Level 2 (SA2) geographies that are affected by or are located near the project and the section of Sydney Harbour adjacent to the project alignment.

For the purposes of this assessment, the study area has been divided into two 'precincts' located north and south of Sydney Harbour. While the harbour does not fall within a specific precinct, potential impacts on Sydney Harbour have also been considered. Although the whole study area was considered, areas within close proximity (400 metres) of a temporary construction support site are more likely to experience direct impacts from construction. The study area is the same for the

Technical working paper: Socio-economic. Broader effects on businesses outside the study area are also considered in the impact assessment.

The SA2s that were affected by, or were in close proximity to the project footprint defined by the study area include:

- South Harbour Precinct (see Figure 2-1)
 - Leichhardt–Annandale
 - Lilyfield–Rozelle
 - Balmain
- North Harbour Precinct (see Figure 2-2)
 - North Sydney–Lavender Bay
 - Neutral Bay–Kirribilli
 - Crows Nest–Waverton
 - Cremorne–Camberay
 - Mosman
 - St Leonards–Naremburn.

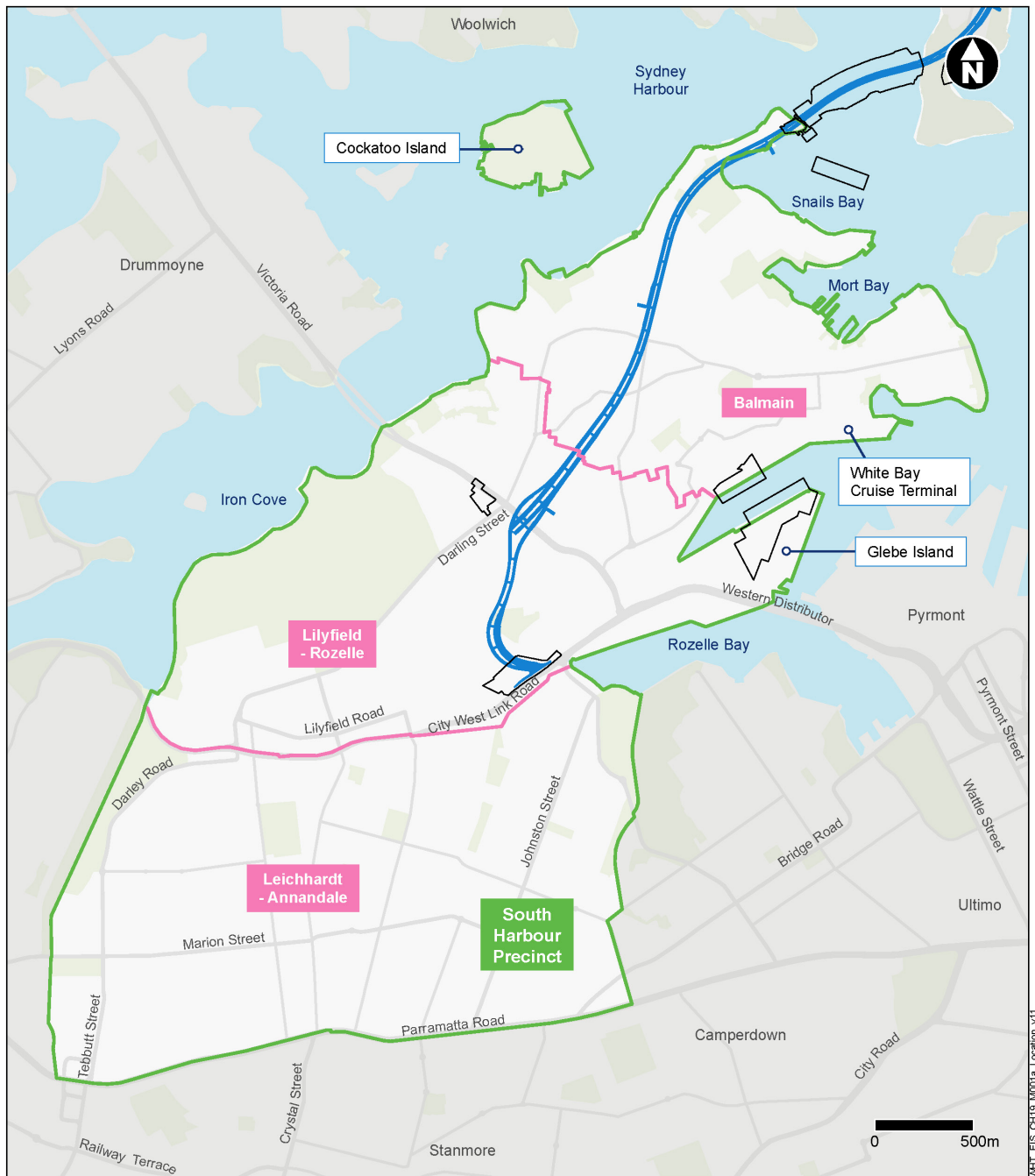


Figure 2-1: Study area – South Harbour Precinct

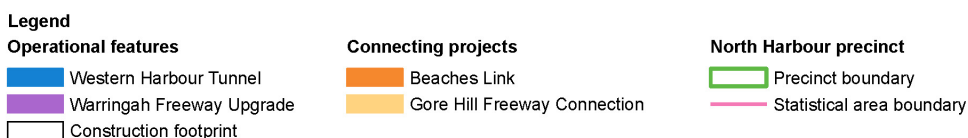
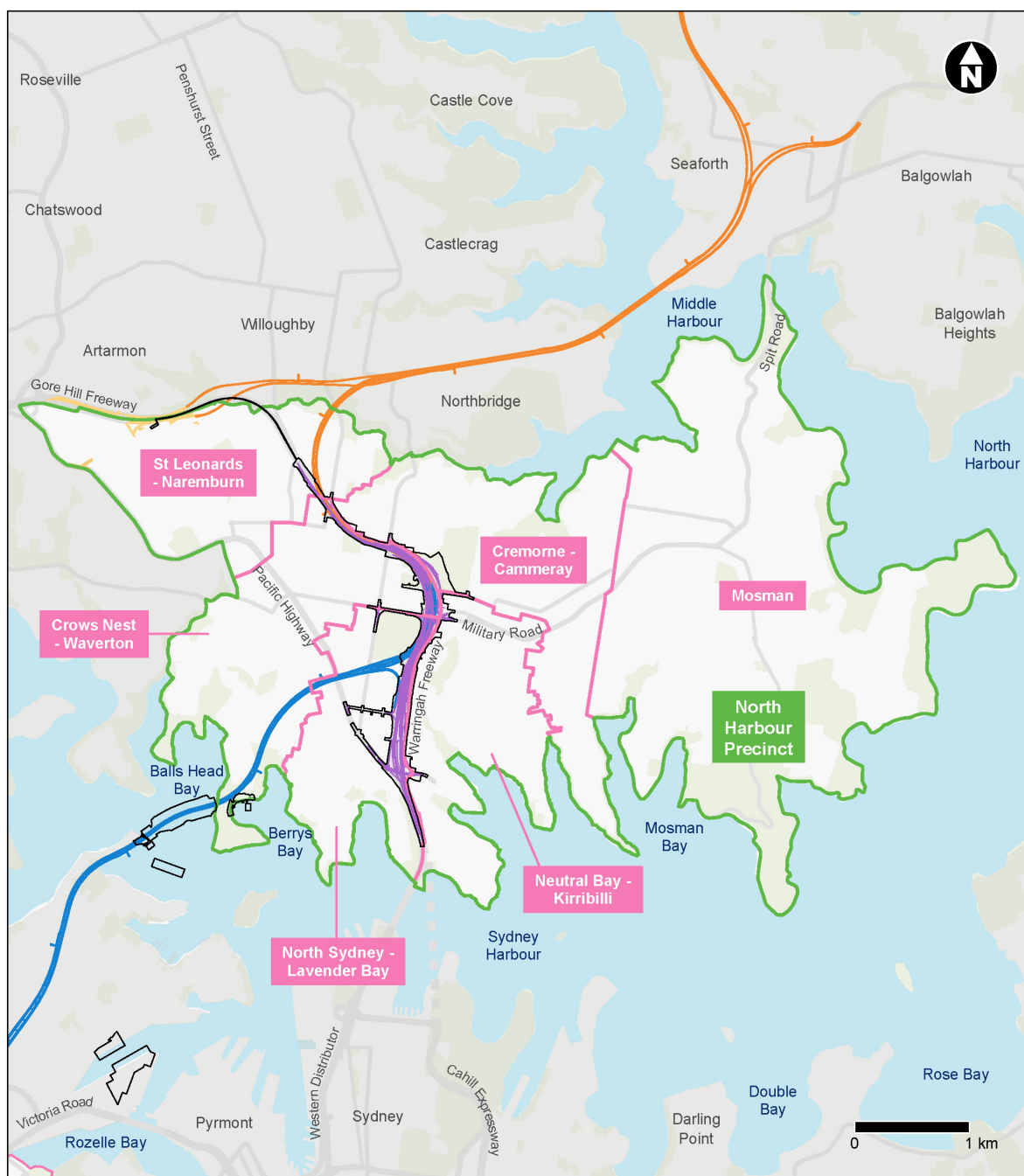


Figure 2-2: Study area – North Harbour Precinct

The study area extent has been defined as it captures the business centres most likely to be affected by the project. It is acknowledged that there may be indirect secondary impacts experienced by business centres outside the study area. However, these centres are not the focus of this assessment. Some benefits and impacts would also be experienced by businesses in the wider region. As such, this assessment considered potential impacts on the surrounding local government areas and the Greater Sydney region at a broader level, where relevant.

When considering direct construction and operational effects, the scoping of issues determined that businesses within close proximity to the temporary construction support sites or operational intersections were more likely to be exposed to potential impacts. In most instances, direct impacts were generally confined to within a 400 metre radius of construction support sites. Scoping identified key potential impacts on businesses, including employee and customer access, passing trade, servicing and delivery, character and amenity, employee productivity and communication, business visibility and demand for services. The study area characteristics section of the report identifies the local centre located in close proximity to temporary construction support sites and surface works or that may be more susceptible to the direct or indirect effects of construction and operation.

2.3 Data sources used to inform the study

The preparation of this report has been informed primarily by project design information and other technical specialist reports prepared for the environmental impact statement. Additional data in this report have been derived from:

- ABS 2016 Census 2016
- ABS 8165.0 Counts of Australian Businesses 2016
- Transport for NSW Transport Performance and Analytics 2017
- Outcomes of business surveys (Appendix B of this report)
- Geographic information system (GIS) information on land use zones as informed by relevant local environmental plans.

2.4 Business survey approach

A business survey was conducted to gain a better understanding of the main issues, perceptions and concerns of businesses in regard to the project during construction and operation. Only publicly available information regarding the project was provided to the survey respondents to inform their responses. This included the initial design and preliminary planning information. The business surveys were conducted in local centres that may be more susceptible to direct or indirect effects of construction or operation. The survey was conducted over a three-week period in November 2017. Businesses were approached at random with over 182 businesses participating in the survey. Further engagement with business stakeholders will be carried out during the environmental impact assessment exhibition period.

Businesses were surveyed at nine locations (see Figure 2-3) and the number of surveys carried out in each location is outlined in Table 2-1.

Table 2-1: Number of business surveys conducted

| Survey location | Businesses surveyed |
|-------------------------------|---------------------|
| North Harbour Precinct | |
| Cammeray | 17 |
| Military Road | 30 |
| North Sydney | 40 |
| Waverton | 6 |
| Spit Junction | 18 |
| South Harbour Precinct | |
| Balmain | 17 |
| Robert Street, Rozelle | 15 |
| Victoria Road/Darling Street | 39 |
| Total | 182 |

The number of surveys collected in each location varied slightly depending on the location's size and the number of businesses present. Every effort was made to survey a range of business types across the study area.

The business survey included a wide variety of business types including retail shops, industrial premises, real estate agencies, cafés, pubs, restaurants, auto service centres and professional service businesses.

All information gathered as part of the business survey was collated into a database. Findings were analysed and summarised in a survey report (refer to Appendix B of this report).

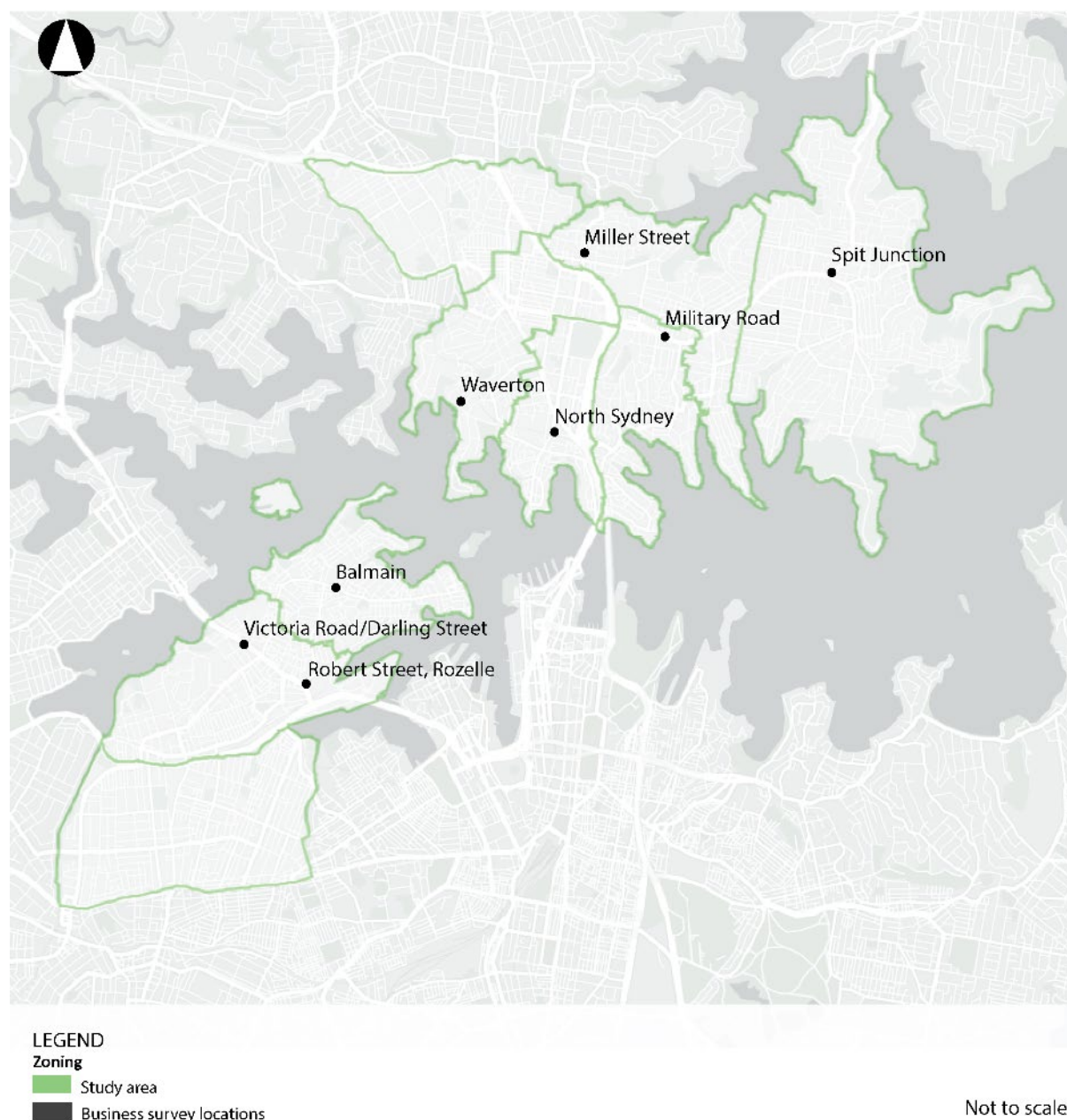


Figure 2-3: Business survey locations

2.5 Evaluation methodology

The impact assessment presented in this report identifies and evaluates changes to the business environment and industry condition arising from construction and operation of the project. This includes the assessment of potential direct and indirect (positive or negative) impacts as well as consideration of potential cumulative impacts. The evaluation methodology used for this assessment has been developed by Roads and Maritime to align with the *Roads and Maritime environmental impact assessment practice note – socio-economic environment*. The assessment methodology is consistent with that applied in the Technical working paper: Socio-economic.

Positive and negative social and economic impacts and opportunities are discussed in the report, however the methodology used requires that only negative impacts are assigned a level of significance. The level of significance of potential negative impacts is assessed by considering the sensitivity of the receptor and the magnitude of the proposed works. A grading matrix is used to identify the level of significance of the negative impact. The assessment of impacts considers the sensitivity and the magnitude of the proposed changes based on the information available at the time, research undertaken to prepare this Business Impact Assessment (BIA), other technical studies, and review of consultation outcomes carried out by Roads and Maritime.

2.5.1 Sensitivity

Sensitivity refers to the qualities of the receptor which influence its vulnerability to change and capacity to adapt. In this context, the receptor may be communities, businesses, business clusters, social infrastructure, residences etc.

Qualities that contribute to the level of sensitivity of a receptor may include but are not limited to existing aspects of the social and economic environment such as:

- Amenity including noise levels, visual quality, air quality
- Demographic composition and patterns
- Economic activity, types of industry and businesses present
- Connectivity and access
- Property and land use types, and known future changes (eg re-zoning)
- Community values
- Community cohesion
- Level of community concern.

The levels of sensitivity are set out in Table 2-2 below. Professional judgement has been used to determine the level of sensitivity assigned to negative impacts.

Table 2-2: Levels of sensitivity

| Sensitivity | Description |
|-------------|---|
| Negligible | No vulnerability and able to absorb or adapt to change |
| Low | Minimal areas of vulnerability and a high ability to absorb or adapt to change |
| Moderate | A number of vulnerabilities but retains some ability to absorb or adapt to change |
| High | Multiple vulnerabilities and/or very little capacity to absorb or adapt to change |

2.5.2 Magnitude

Magnitude refers to the scale, duration, intensity and scope of the proposal including how it would be constructed and operated. Qualities of magnitude include, but are not limited to:

- Scale and intensity (the types of works, operational uses and built form etc)
- Spatial extent (eg the geographical area affected which may be local, suburb, regional, State, international or to community groups etc)
- Duration (short, medium or long-term, hours of works, frequency, reversibility etc).

The levels of magnitude are set out in Table 2-3 below. Professional judgement has been used to determine the level of magnitude assigned to negative impacts.

Table 2-3: Levels of magnitude

| Magnitude | Example |
|------------|--|
| Negligible | No discernible positive or negative changes caused by the impact. Change from the baseline remains within the range commonly experienced by receptors. |
| Low | A discernible change from baseline conditions. Tendency is that the impact is to a small proportion of receptors over a limited geographical area and mainly within the vicinity of the project. The impact may be short term or some impacts may extend over the life of the proposal. |
| Moderate | A clearly noticeable difference from baseline conditions. Tendency is that the impact is to a small to large proportion of receptors and may be over an area beyond the vicinity of the project. Duration may be short to medium-term or some impacts may extend over the life of the project. |
| High | A change that dominates over existing baseline conditions. The change is widespread, persists over many years or is effectively permanent. |

2.5.3 Assessing level of significance

Positive and negative social and economic impacts and opportunities are discussed in the report, however only negative impacts are assigned a level of significance. The level of significance is considered for construction impacts, operational impacts and cumulative impacts.

Issue appraisal tables have been included in the construction and operation sections of the report. These tables assess the potential negative impact issues that may arise as a result of the project and have the capacity to affect business revenue and viability. Positive impacts and opportunities are not assessed in the issue appraisal table and are not assigned a level of significance under this methodology.

The level of significance for potential negative impacts are considered using the grading matrix shown in Table 2-4 below. The combination of sensitivity and magnitude determines the level of significance when compared to the baseline condition.

Table 2-4: Assessing the level of significance

| Significance evaluation | Magnitude | | | | |
|-------------------------|------------|---------------|---------------|--------------|------------|
| Sensitivity | | High | Moderate | Low | Negligible |
| | High | High impact | High-Moderate | Moderate | Negligible |
| | Moderate | High-Moderate | Moderate | Moderate-low | Negligible |
| | Low | Moderate | Moderate-low | Low | Negligible |
| | Negligible | Negligible | Negligible | Negligible | Negligible |

Centre specific evaluation

The evaluation component of the construction and operation section appraises both positive and negative impacts and considers the overall effect of the project on the centre specific business environment. The conclusion states the result of the ultimate evaluation.

3.0 STUDY AREA CHARACTERISTICS

This section provides an overview of the study area business environment. The information in this section has been informed by the Australian Census of Housing and Population (ABS, 2016), Australian Statistics Business Indicators (ABS, 2016) and the Bureau of Transport Statistics (NSW Government). Where relevant, the Greater Sydney Metropolitan area was used as a comparison to enable the study area to be placed into perspective.

3.1 Business centre profiles

A hierarchy of centres has been applied to the study area. The hierarchy is based largely on work in the *Greater Sydney Region Plan 2017* by the Greater Sydney Commission (GSC), which identified that some centres make a substantially greater contribution to the economy of Greater Sydney than others. The GSC has defined a centres hierarchy, which includes three types of centres: metropolitan city centre, strategic and local. These centres vary in terms of scale and contribution to Greater Sydney's job growth and productivity as well as service provision to local communities. According to the GSC's definitions, North Sydney forms part of the Harbour CBD metropolitan area and St Leonards is a strategic centre. There are also several local centres within the study area.

The GSC has also classified industrial areas. Industrial land can include a range of activities from major freight and logistics and heavy manufacturing to light industry, urban services and new economy or creative uses. Some industrial areas include businesses that support surrounding residential populations and commercial communities. This study includes industrial centres with businesses that service other businesses and populations.

Businesses that operate outside of business and industrial zones have not been identified in the study area characteristics section. However, they have been considered in the assessment of impacts (refer to section 5.0 and section 6.0)

The typology of centres relevant to the study area is defined in Table 3-1.

Table 3-1: Business centre types in the study area

| Hierarchy | Description |
|---------------------|--|
| Metropolitan centre | A metropolitan centre is a global gateway and financial capital. It is well-established, well-served and highly accessible by its radial rail network. The centre contains over half a million jobs and is the largest office market in the region. |
| Strategic centres | Strategic centres are defined when the mix of activities, size and location enable the community to access a wide range of goods, services and jobs. Strategic centres generally include: <ul style="list-style-type: none">• High levels of private sector investment• Flexibility, so that the private sector can choose where and when to invest• Co-location of a wide mix of land uses, including residential• High levels of amenity and walkability• Areas identified for commercial uses, and where appropriate, commercial cores. |
| Local centres | Local centres are the focal point of neighbourhoods and meet residents' needs for shopping, social interaction, cultural and creative expression. They vary in size from a cluster of local shops to large-box format retail centres. They each perform a variety of functions but all form an important part of local community life as social connectors. |

| Hierarchy | Description |
|--------------------|---|
| Industrial centres | <p>Industrial centres include a wide range of businesses that service other business and populations. This typically includes warehousing, freight and logistics, construction and building supplies, and domestic storage. It may also include:</p> <ul style="list-style-type: none"> • New economy uses (eg artisan industries such as furniture making, upholstery, niche manufacturing) and creative uses • Industrial and urban services wholesale such as low to medium scale buildings supplying industrial and urban services businesses with hardware, building materials, and related resources. |
| Working waterfront | <p>The working waterfront includes business centres located on a waterfront. Businesses in the working waterfront are most commonly marine-related, including dry storage, slipways, harbour cruises, government agency (Maritime NSW), public marina berths as well as supportive food services such as cafés.</p> |

Source: HillPDA, adapted from Greater Sydney Commission, 2018

Business centres located within 400 metres of a construction site or construction footprint are most likely to experience direct impacts arising from the project. The business centres in the study area and their proximity to project construction sites is indicated in Figure 3-1.

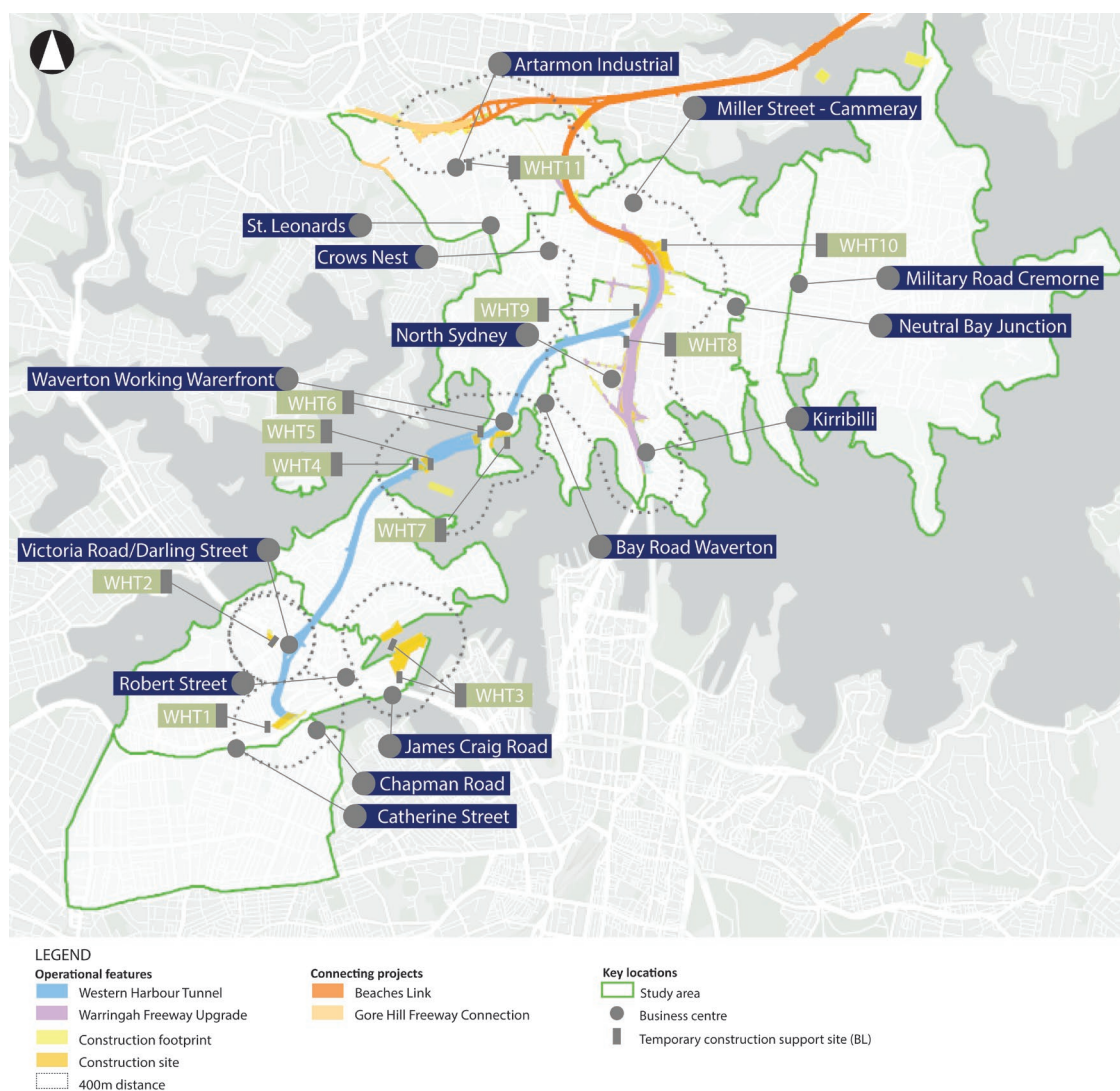


Figure 3-1: Study area business centres in proximity to construction sites

Source: HillPDA, 2018

Table 3-2 indicates the centres in the study area that have been examined according to the criteria described above. To assist the analysis, centres have been separated into two precincts being:

- South Harbour Precinct
- North Harbour Precinct.

Some centres are within the study area for the Beaches Link and Gore Hill Freeway Connection project. The study area also contains a wide variety of businesses located outside of a business centre.

Table 3-2: Business centres in proximity to project construction sites

| Centre | Study Area | Precinct |
|--|---|------------------------|
| Metropolitan centre | | |
| North Sydney CBD (part of Harbour CBD) | Western Harbour Tunnel | North Harbour Precinct |
| Strategic centre | | |
| St Leonards | Western Harbour Tunnel Beaches Link and Gore Hill Freeway Connection | North Harbour Precinct |
| Local Centres | | |
| Catherine Street centre | Western Harbour Tunnel | South Harbour Precinct |
| Victoria Road/Darling Street centre | Western Harbour Tunnel | South Harbour Precinct |
| Miller Street Cammeray centre | Western Harbour Tunnel | North Harbour Precinct |
| Kirribilli centre | Western Harbour Tunnel | North Harbour Precinct |
| Bay Road Waverton centre | Western Harbour Tunnel | North Harbour Precinct |
| St Leonards–Crows Nest | Western Harbour Tunnel | North Harbour Precinct |
| Military Road Cremorne centre | Western Harbour Tunnel Beaches Link and Gore Hill Freeway Connection | North Harbour Precinct |
| Neutral Bay Junction | Western Harbour Tunnel Beaches Link and Gore Hill Freeway Connection | North Harbour Precinct |
| Industrial centres | | |
| Robert Street industrial | Western Harbour Tunnel | South Harbour Precinct |
| Artarmon industrial centre | Western Harbour Tunnel Beaches Link and Gore Hill Freeway Connection | North Harbour Precinct |
| Working waterfront | | |
| James Craig Road working waterfront | Western Harbour Tunnel | South Harbour Precinct |
| Chapman Road working waterfront | Western Harbour Tunnel | South Harbour Precinct |
| Waverton working waterfront | Western Harbour Tunnel | North Harbour Precinct |

The following section provides an overview of the characteristics of the above business centres.

3.1.1 South Harbour Precinct

The South Harbour Precinct includes the SA2s of Balmain, Leichhardt-Annandale and Lilyfield Rozelle within the Inner West LGA. The precinct is about five kilometres west of the Sydney CBD, and extends from Sydney Harbour in the north and east to Parramatta Road in the south and Hawthorne Canal in the west.

The precinct contains a number of commercial and industrial areas, including the major working waterfront area along James Craig Road. The following sections provide an overview of centres (within proximity to the construction footprint) containing business and industrial zones or working waterfront uses under the Leichhardt Local Environmental Plan or *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*.

3.1.1.1 Catherine Street centre

Figure 3-2 shows the Catherine Street centre and surrounds. Table 3-3 describes the businesses present.



Figure 3-2: Catherine Street centre location context

Source: HillPDA, 2018

Table 3-3: Catherine Street centre description

| Land zoning | Area (ha) | Function/observations |
|-----------------|-----------|--|
| B2 Local Centre | 2 | <ul style="list-style-type: none"> Catherine Street, Lilyfield contains two small business centres A larger convenience store is located on the corner of City West Link and operates as the anchor tenant. A small mixed-use retail centre is present containing a variety of small businesses Businesses in the cluster cater to a neighbourhood catchment and are likely to be reliant on passing trade. |

3.1.1.2 Victoria Road/Darling Street centre

Figure 3-3 shows the Victoria Road/Darling Street centre and surrounds. Table 3-4 describes the businesses present.

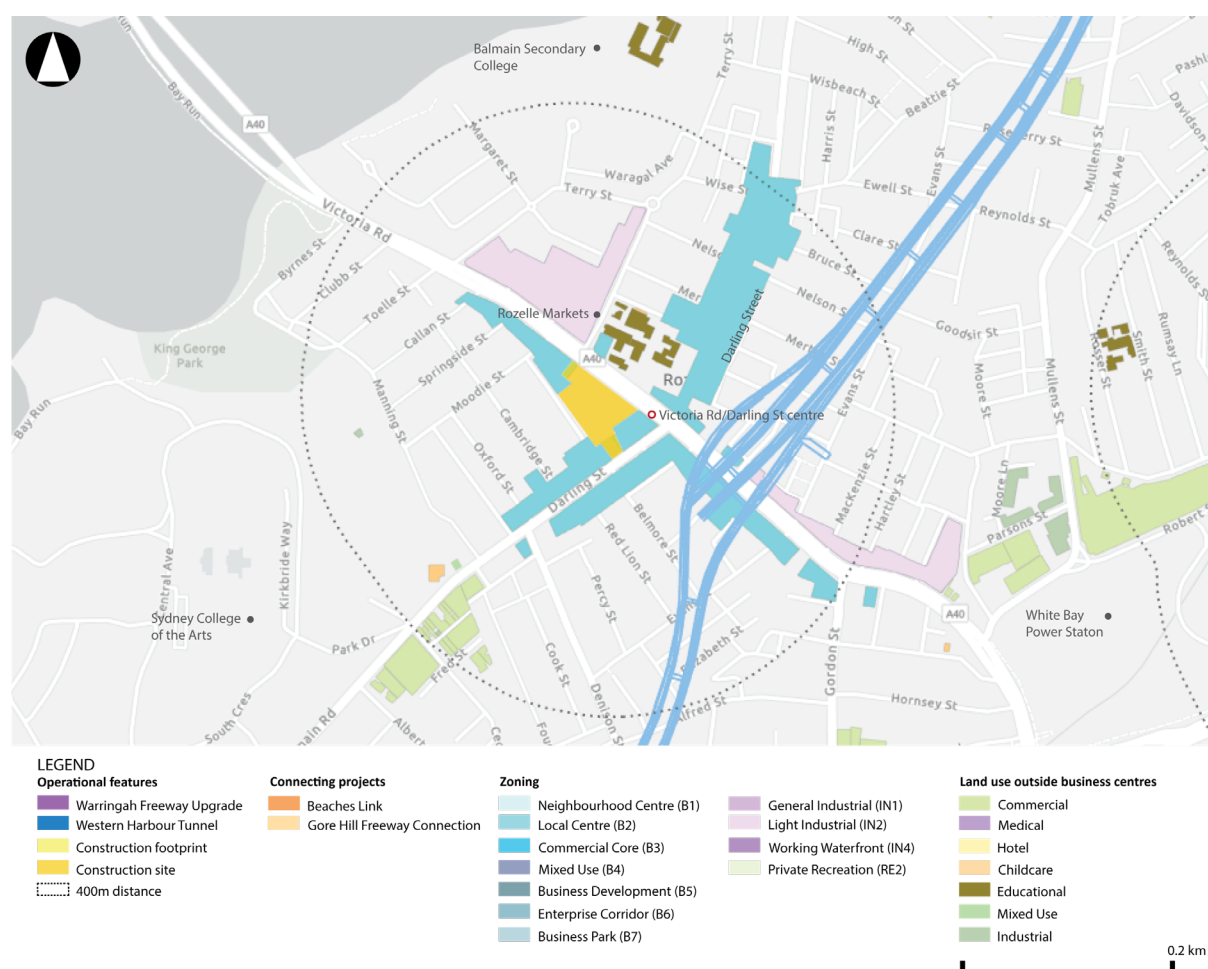


Figure 3-3: Victoria Road/Darling Street Centre location context

Source: HillPD, 2018

Table 3-4: Victoria Road/Darling Street Centre description

| Land zoning | Area (ha) | Function/observations |
|-----------------|-----------|---|
| B2 Local Centre | 7.2 | <ul style="list-style-type: none"> The businesses on Victoria Road in close proximity to the Darling Street intersection contain a variety of retail and personal medical services Businesses along Victoria Road generally offer specialised services or products that customers would travel to specifically. The businesses would serve a wide catchment and although they are heavily dependent on business visibility, they would be less dependent on passing trade Darling Street, Rozelle is mainly oriented towards food retailing. There is also a mix of clothing retailing and personal services as well as a small number of commercial businesses (banks and post offices) and health services (gyms and medical centre) Darling Street would rely on passing trade and would service both a neighbourhood and wider catchment. |

Table 3-5: Robert Street Industrial centre description

| Land zoning | Area (ha) | Function/observations |
|----------------------|-----------|---|
| IN2 Light Industrial | 6.9 | <ul style="list-style-type: none"> Robert Street, Rozelle contains automotive, storage, trade and maritime-related businesses The cluster also contains businesses needing large floorplates such as indoor recreation facilities and places of worship They service both a neighbourhood and wider catchment and are unlikely to be dependent on passing trade. These businesses are destination services as many customers would drive specifically to the businesses. |

3.1.1.4 James Craig Road working waterfront

Figure 3-5 shows the James Craig Road working waterfront and surrounds while Table 3-6 describes the businesses present.

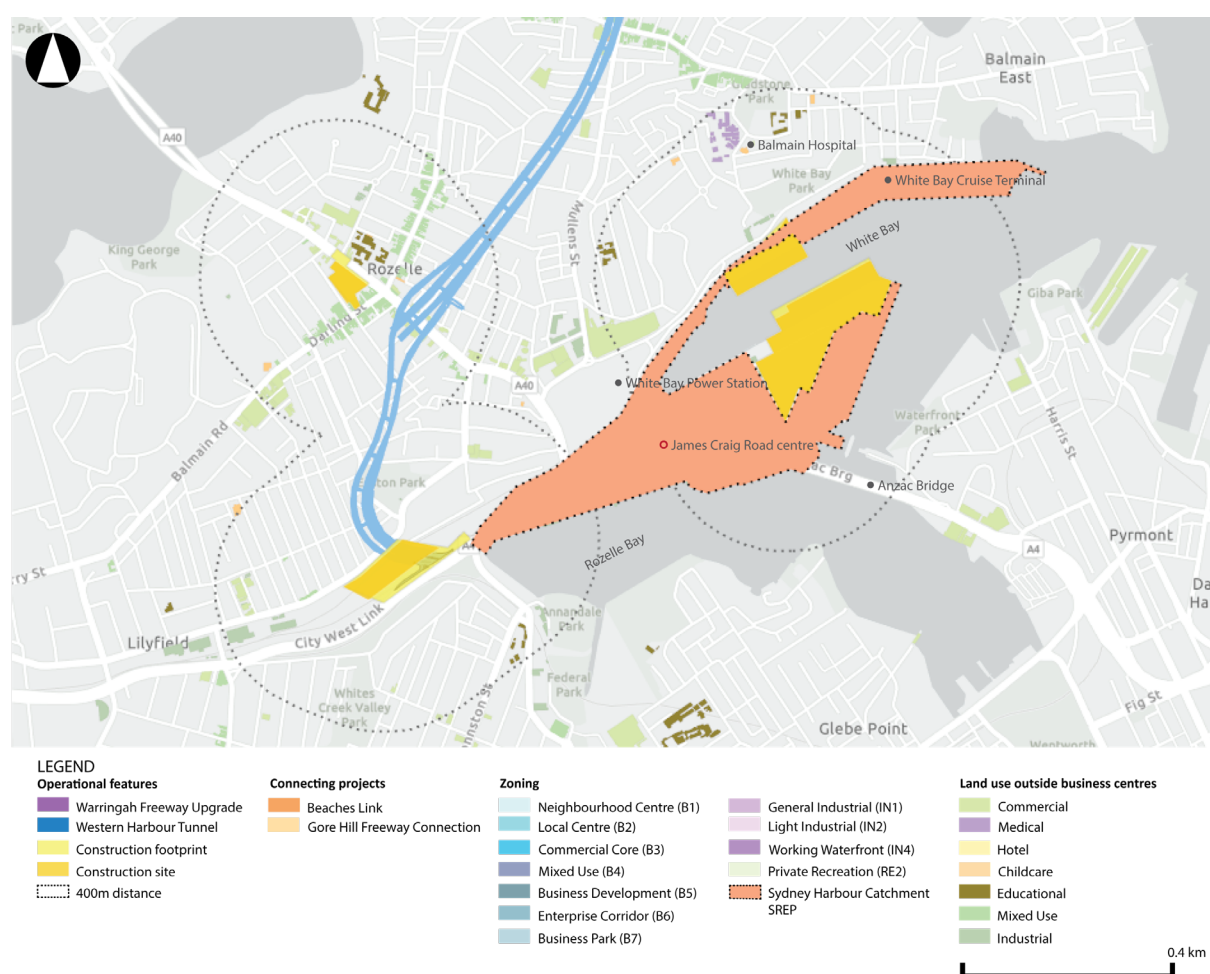


Figure 3-5: James Craig Road working waterfront location context

Source: HillPDA, 2018

Table 3-6: James Craig Road working waterfront description

| Land zoning | Area (ha) | Function/observations |
|--|-----------|---|
| Sydney Harbour Catchment (Sydney Regional Environmental Plan – SREP) | 52.3 | <ul style="list-style-type: none"> This waterfront cluster comprises a number of maritime businesses Businesses in the cluster are predominantly marine related, including dry storage, slipways, harbour cruises, government agency (Roads and Maritime), public marina berths as well as supportive food services such as cafés Ports Authority NSW White Bay Cruise terminal is found at this centre. The Terminal is also hired out as a venue for private events. The Sydney Harbour Boat Storage, a dry stack boat storage, service, maintenance and fuel facility is also located along James Craig Road working waterfront. At Glebe Island, the Port Authority of NSW is proposing to construct and operate a multi-user facility for the import, storage and distribution of dry bulk materials such as sand and aggregates There is also a proposal (yet to obtain planning approval) for the relocation of the Hanson Construction concrete batching plant to Glebe Island The working waterfront would be dependent on access and connectivity, servicing a wide catchment. The business clusters are unlikely to be dependent on passing trade. |

3.1.1.5 Chapman Road working waterfront

Figure 3-6 shows the Chapman Road working waterfront and surrounds. Table 3-7 describes the businesses present.

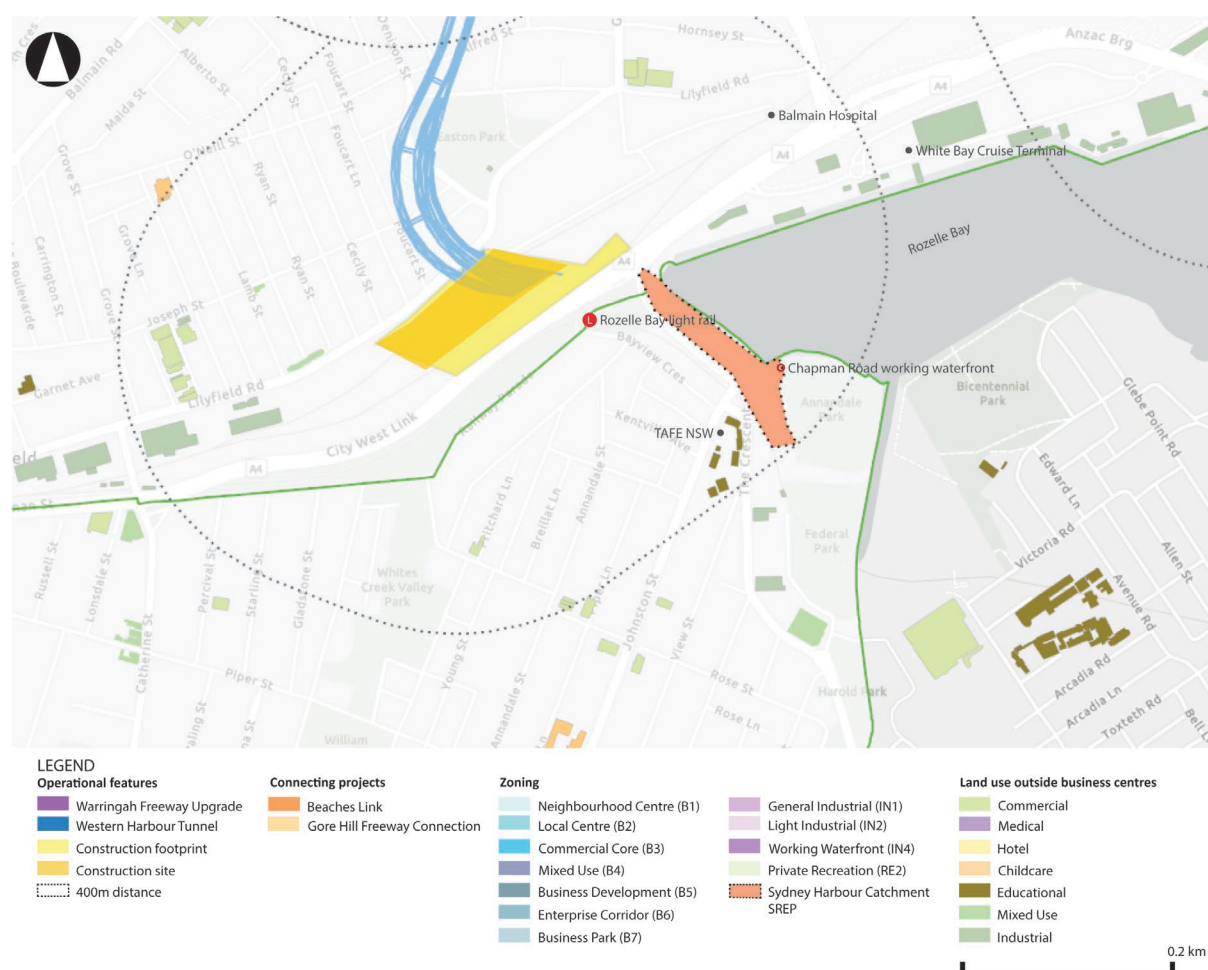


Figure 3-6: Chapman Road working waterfront location context

Source: HillPDA, 2018

Table 3-7: Chapman Road working waterfront description

| Land zoning | Area (ha) | Function/observations |
|---------------------------------|-----------|---|
| Sydney Harbour Catchment (SREP) | 1.4 | <ul style="list-style-type: none"> • This waterfront cluster comprises a number of maritime businesses • Businesses in the cluster are predominantly marine related, including boat hire, a multihull marina, charter boating and a slipway • The working waterfront would be dependent on access and connectivity, servicing a wide catchment. The business cluster is unlikely to be dependent on passing trade. |

3.1.2 North Harbour Precinct

The North Harbour Precinct comprises the SA2s of North Sydney–Lavender Bay, Neutral Bay–Kirribilli, St Leonards–Crows Nest, Waverton, Mosman, Cremorne–Cammeray and St Leonards–Naremburn within the North Sydney, Willoughby and Mosman LGAs. The precinct is located north of the Sydney CBD on the northern side of Sydney Harbour and extends from Sydney Harbour in the south and east, to Flat Rock Creek and Gore Hill Freeway in the north and the Pacific Highway and Berrys Creek in the west.

The precinct contains a number of commercial and industrial areas, including the major commercial centre of North Sydney and St Leonards. The following sections provide an overview of centres close to the construction footprint containing business and industrial zones or working waterfront uses under the Local Environmental Plans. Businesses that operate outside of business and industrial zones have not been overviewed in the study area characteristics, however have been considered in the assessment of impacts (see section 5.0 and section 6.0).

3.1.2.1 Waverton working waterfront

Figure 3-7 shows the Waverton working waterfront and surrounds. Figure 3-7 describes the businesses present.

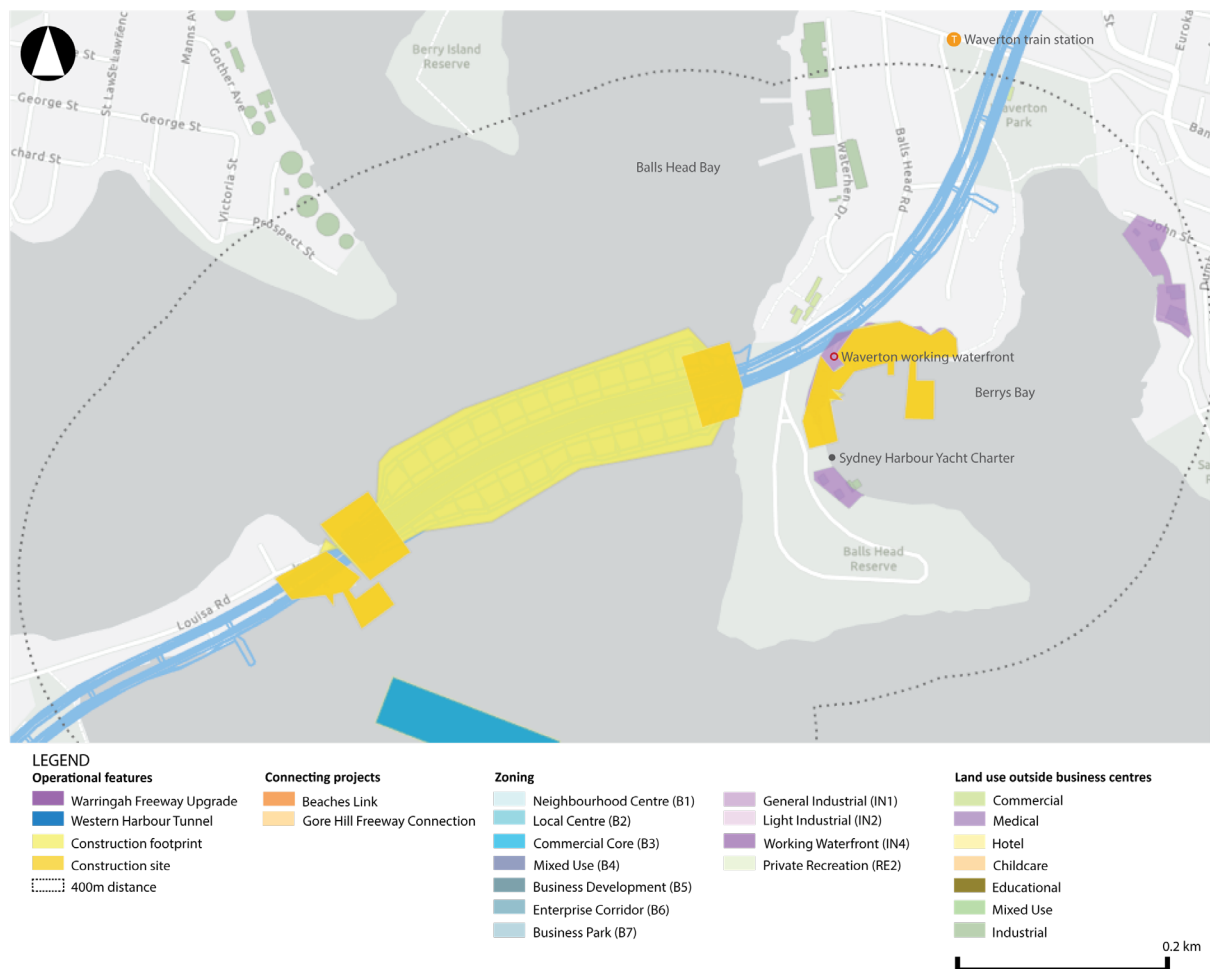


Figure 3-7: Waverton working waterfront location context

Source: HillPDA, 2018

Table 3-8: Waverton working waterfront description

| Land zoning | Area (ha) | Function/observations |
|------------------------|-----------|---|
| IN4 Working Waterfront | 1.9 | <ul style="list-style-type: none"> This waterfront cluster comprises a number of maritime businesses Businesses present include a yacht charter company, as well as boat repair and storage facilities Businesses located in the cluster are specialists and do not rely on passing trade. |

3.1.2.2 Miller Street Cammeray centre

Figure 3-8 shows the Miller Street Cammeray centre and surrounds. Table 3-9 describes the businesses present.

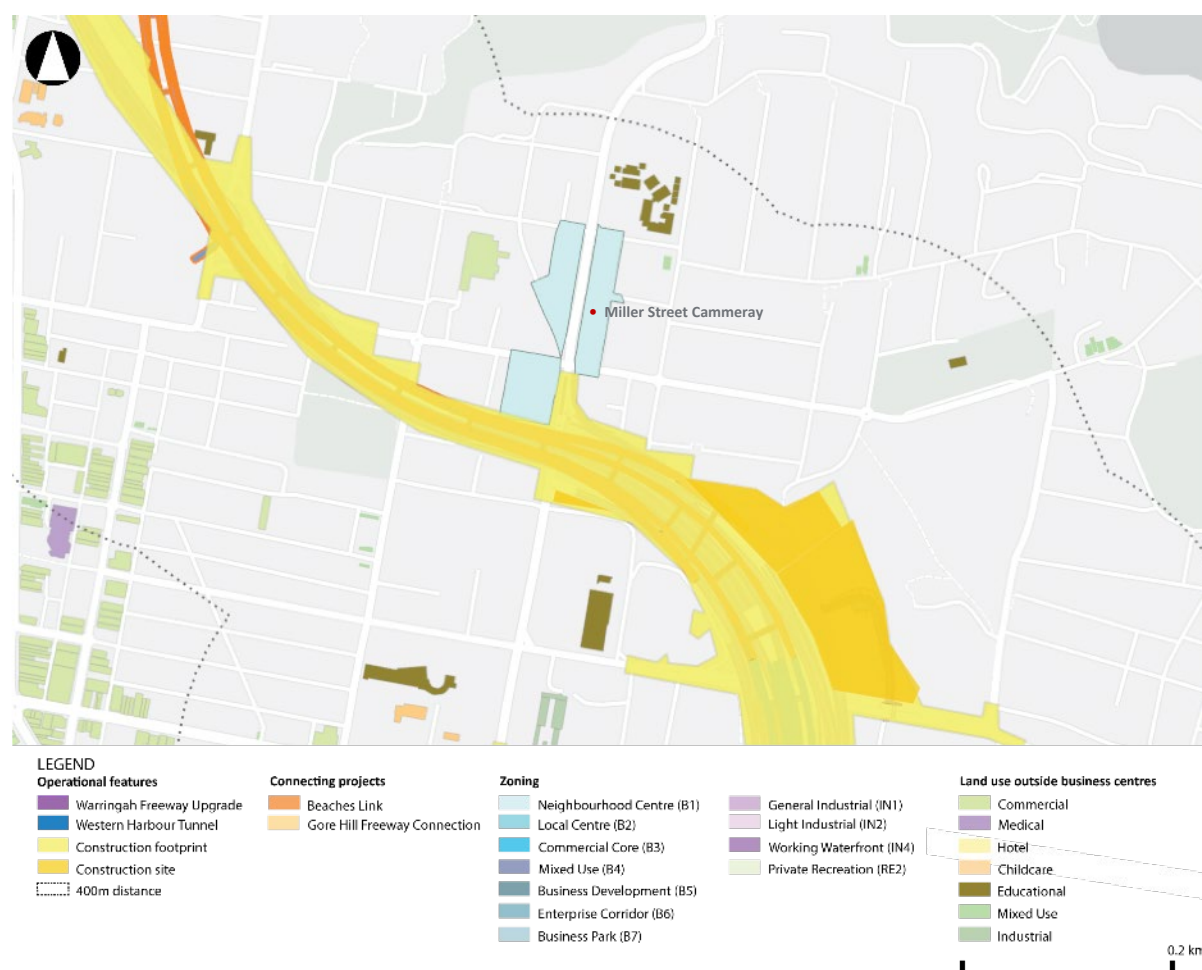


Figure 3-8: Miller Street Cammeray Centre location context

Source: HillPDA, 2018

Table 3-9: Miller Street Cammeray centre description

| Land zoning | Area (ha) | Function/observations |
|--------------------------------|-----------|---|
| B1 Neighbourhood Centre | 2.7 | <ul style="list-style-type: none"> The cluster contains a diverse mix of uses including a Stockland shopping centre, food and drink retailers, commercial businesses and neighbourhood shops Neighbourhood shops include a post office, service station, bakery, convenience stores, cafés and newsagents The cluster caters primarily to a neighbourhood catchment. However, as a state road, businesses along Miller Street would also attract passing trade from residents of neighbouring suburbs. |

3.1.2.3 North Sydney CBD

Figure 3-9 shows the North Sydney CBD and surrounds. Table 3-10 describes the businesses present.

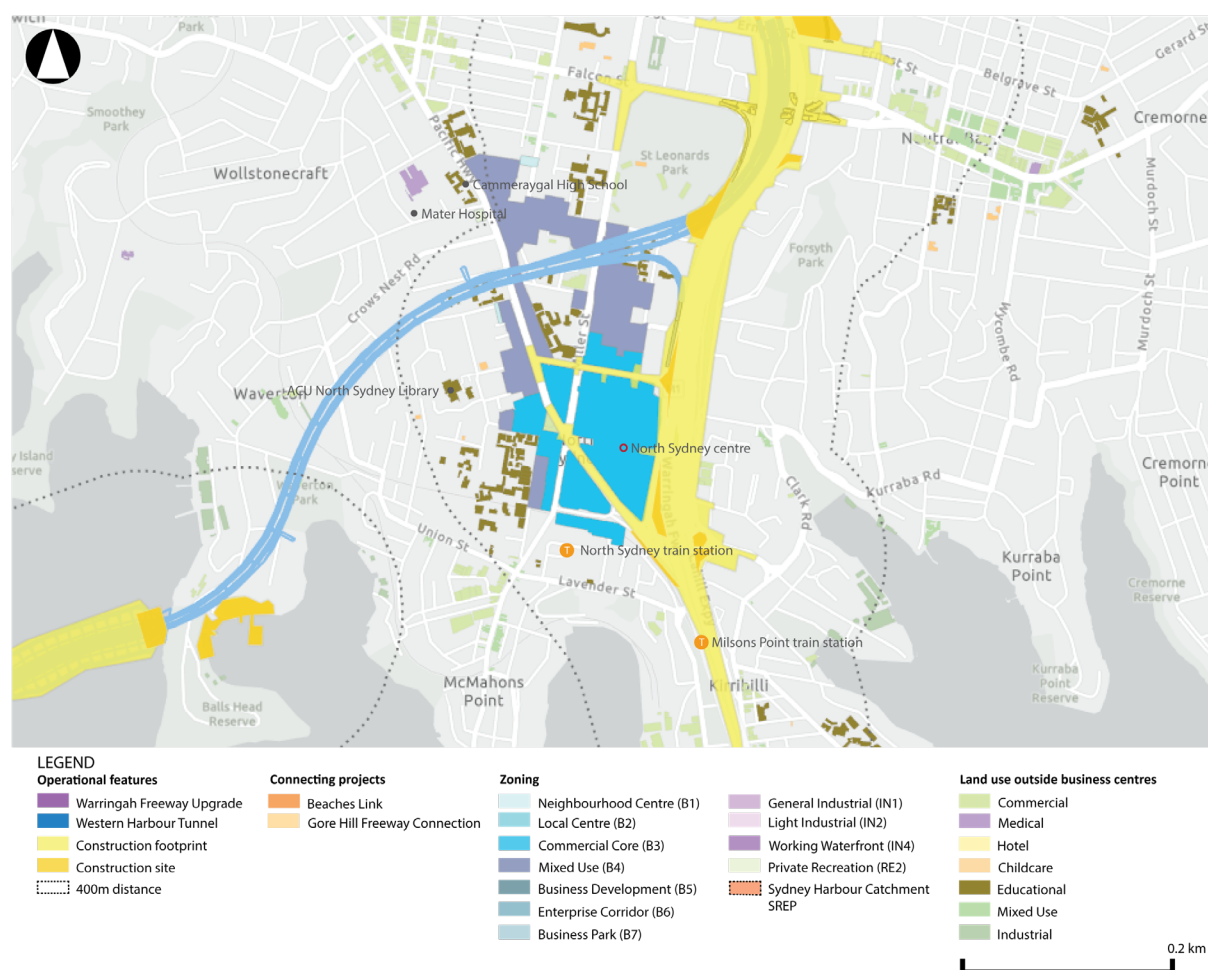


Figure 3-9: North Sydney CBD location context

Source: HillPDA, 2018

Table 3-10: North Sydney CBD description

| Land zoning | Area (ha) | Function/observations |
|---------------------------|-----------|---|
| B3 Commercial Core | 15.9 | <ul style="list-style-type: none"> The area of North Sydney zoned B3 commercial core is known as North Sydney CBD The area comprises commercial offices and businesses catering largely to workers in the offices located in the area These businesses include food and drink retailers as well as gyms and fitness centres. |
| B4 Mixed Use | 14.6 | <ul style="list-style-type: none"> The area of North Sydney zoned B4 Mixed Use surrounds North Sydney CBD and comprises a wide range of uses including residential, community facilities and schools Businesses in the area include commercial offices, food and drink retailers, sports clubs and accommodation services Businesses in the area service a neighbourhood catchment as well as those visiting for work. |

3.1.2.4 Kirribilli centre

Figure 3-10 shows the Kirribilli centre and surrounds. Table 3-11 describes the businesses present.



Figure 3-10: Kirribilli centre location context

Source: HillPDA, 2018

Table 3-11: Kirribilli centre description

| Land zoning | Area (ha) | Function/observations |
|-------------|-----------|--|
| B1 | 1.9 | <ul style="list-style-type: none"> Kirribilli centre contains schools, a church, convenience retail stores, various food and drink retailers and neighbourhood shops. The area also contains shop top offices and medical practices Neighbourhood shops include a florist, convenience store and post office The cluster caters primarily to a neighbourhood catchment. |

3.1.2.5 Bay Road Waverton centre

Figure 3-11 shows the Bay Road Waverton centre and surrounds. Table 3-12 describes the businesses present.

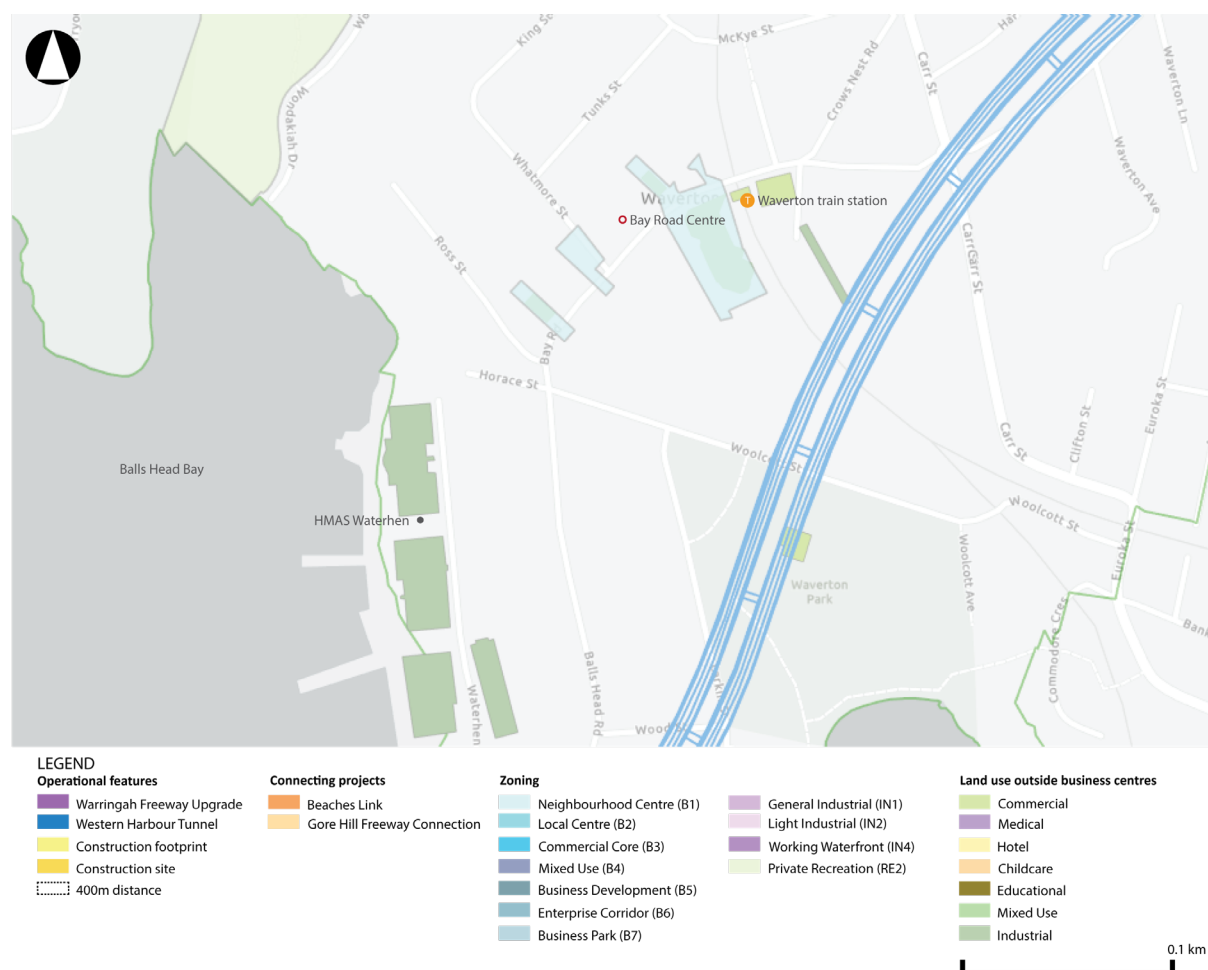


Figure 3-11: Bay Road Waverton centre location context

Source: HillPDA, 2018

Table 3-12: Bay Road Waverton centre description

| Land zoning | Area (ha) | Function/observations |
|--|-----------|--|
| B1 Neighbourhood Centre | 0.6 | <ul style="list-style-type: none"> The Waverton cluster contains a church and a small number of neighbourhood businesses centred around Waverton Railway Station Neighbourhood shops include a convenience store, chemist, butcher as well as two restaurants and a café. There is also a gym/fitness facility The cluster caters primarily to a neighbourhood catchment. |

3.1.2.6 St Leonards-Crows Nest centre

Figure 3-12 shows the St Leonards and Crows Nest centres and surrounds. Table 3-13 describes the businesses present.



Figure 3-12: St Leonards–Crows Nest location context

Source: HillPD, 2018

Table 3-13: St Leonards–Crows Nest centre description

| Land zoning | Area (ha) | Function/observations |
|---------------------------|-----------|--|
| B3 Commercial Core | 6.5 | <ul style="list-style-type: none"> St Leonards is a Strategic Centre zoned B3 Commercial Core. The area comprises commercial offices and businesses catering largely to workers in the offices located in the area These businesses include food and drink retailers as well as gyms, fitness centres, a pub and major supermarket Medical suites are also within the centre, catering to the nearby Mater Hospital Most businesses mainly service office workers during the working week. |
| B4 Mixed Use | 27 | <ul style="list-style-type: none"> The area of Crows Nest zoned B4 Mixed Use comprises a wide range of different uses including residential, community facilities and schools as well as various food and drink retailers. The cluster also contains specialty stores Specialty stores in the area include a costume shop and musical instrument store. Community facilities include schools, libraries and indoor sporting facilities Most businesses in the area service a neighbourhood catchment as well as those visiting for work or a night out. The specialty businesses are destination stores as many customers would drive specifically to the businesses. |

3.1.2.7 Military Road Cremorne centre

Figure 3-13 shows the Military Road Cremorne centre and surrounds. Table 3-14 describes the businesses present.



Figure 3-13: Military Road Cremorne centre location context

Source: HillPDA, 2018

Table 3-14: Military Road Cremorne centre description

| Land zoning | Area (ha) | Function/observations |
|-----------------|-----------|---|
| B4 Mixed Use | 5.2 | <ul style="list-style-type: none"> The area of Military Road in Cremorne zoned B4 Mixed Use comprises a wide range of different uses including residential, community facilities and schools Businesses in the area include commercial offices, food and drink retailers, sports clubs, accommodation services and two major supermarkets Businesses in the cluster serve local residents as well as commuters and those visiting for work. Commercial businesses are not likely to rely on passing trade. |
| B2 Local Centre | 1.2 | <ul style="list-style-type: none"> The area of Military Road in Cremorne zoned B2 Local Centre consists of a small parcel of land at the junction of Military Road, Glover Street and Macpherson Street The area comprises two businesses, a car dealership, medical centre as well as a mixed-use building. This building comprises residential apartments and townhouses and ground floor retail space. These are residential apartments with an adjoining retail or commercial space facing Military Road. These spaces are currently in the leasing/sales stage The car dealership is a destination business specialising in a particular brand of vehicle while the medical centre services a neighbourhood catchment. The retail and mixed-use spaces service a mix of neighbourhood catchment and further afield depending on the type of businesses. |

3.1.2.8 Neutral Bay Junction

Figure 3-14 shows Neutral Bay Junction and surrounds. Table 3-15 describes the businesses present.

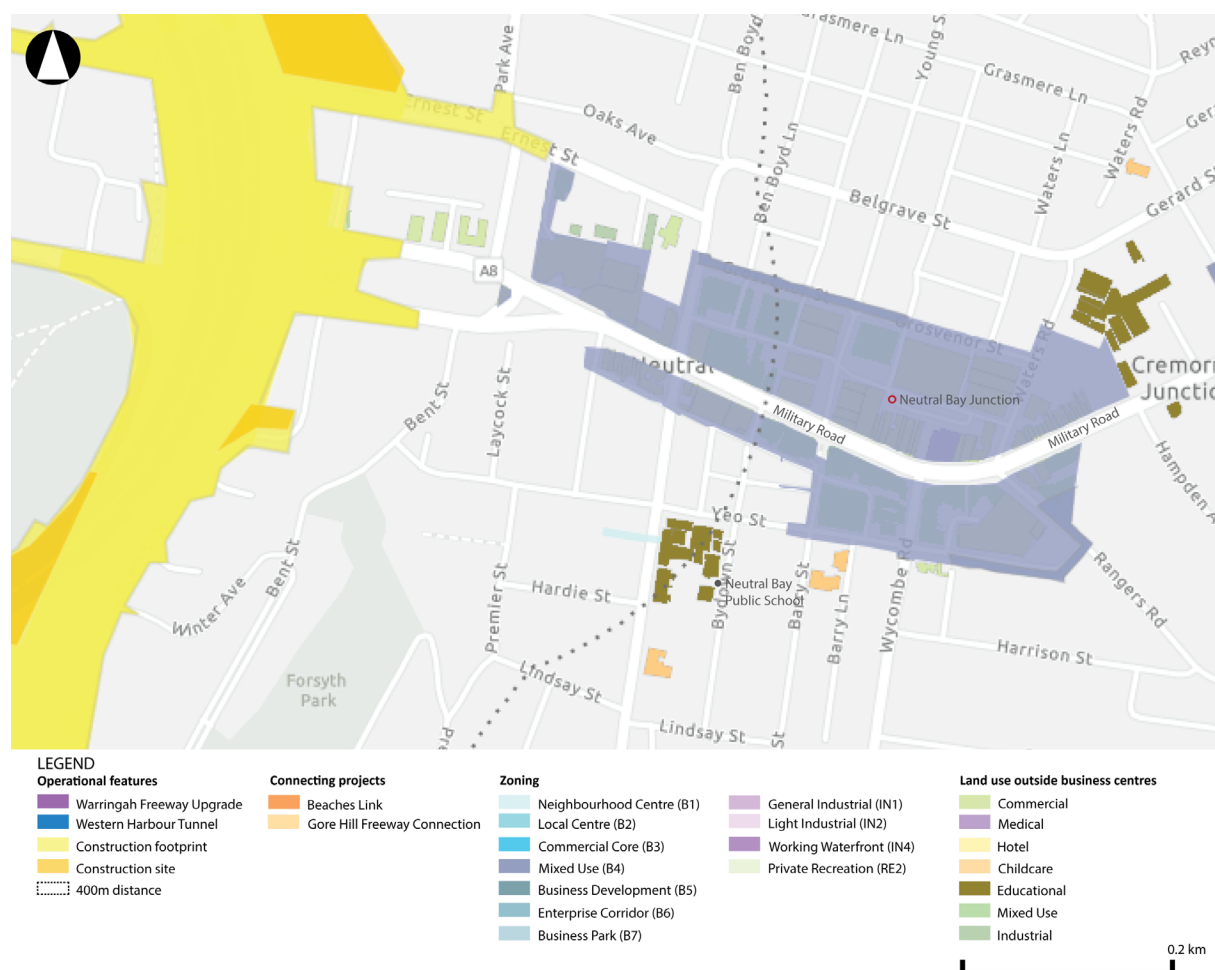


Figure 3-14: Neutral Bay Junction location context

Source: HillPDA, 2018

Table 3-15: Neutral Bay Junction description

| Land zoning | Area (ha) | Function/observations |
|--------------|-----------|---|
| B4 Mixed Use | 11.7 | <ul style="list-style-type: none"> The area of Neutral Bay zoned B4 Mixed Use comprises a wide range of different uses including residential, community facilities and schools Businesses in the area include commercial offices, food and drink retailers, sports clubs and accommodation services Businesses in the cluster serve local residents as well as commuters and those visiting for work. Commercial businesses are not likely to rely on passing trade. |

3.1.2.9 Artarmon Industrial centre

Figure 3-15 shows the Artarmon industrial centre and surrounds. Table 3-16 describes the businesses present.

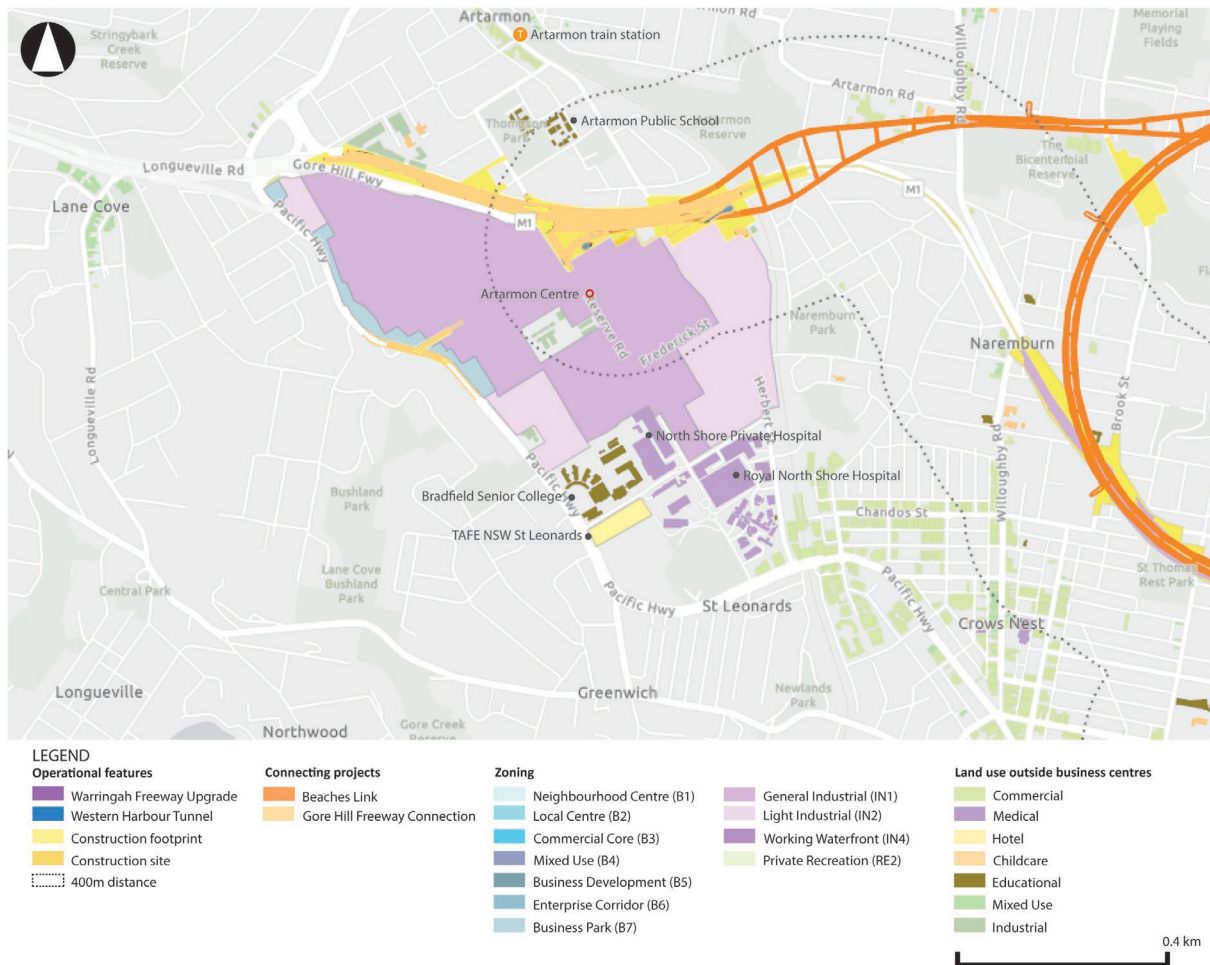


Figure 3-15: Artarmon industrial centre location context

Source: HillPDA, 2018

Table 3-16: Artarmon industrial centre description

| Land zoning | Area (ha) | Function/observations |
|------------------------|-----------|--|
| IN1 General Industrial | 55.4 | <ul style="list-style-type: none"> The area of Artarmon zoned IN1 General Industrial is characterised by a large number of automotive and film-related businesses as well as construction-related commercial businesses Automotive businesses include vehicle sales, rental and repair. Film-related businesses include SBS studios and film equipment rental and sales. Construction-related businesses include equipment sale and hire as well as the sale of construction materials such as concrete Businesses located in the cluster are destination stores as many customers would drive specifically to the businesses. |
| IN2 Light Industrial | 21.1 | <ul style="list-style-type: none"> Land in Artarmon zoned IN2 is located in two distinct areas to the east and south of Artarmon. The areas include businesses in the automotive and film industry as outlined above but also present are other businesses which require large floorplates Businesses in the area include gym and fitness facilities, warehouse/storage facilities and commercial businesses which require warehouses. There are also large hardware and homeware stores, waste facility and major postal facility Businesses in the area service both a neighbourhood and wider catchment and are unlikely to be dependent on passing trade. These businesses are destination services as many customers would drive specifically to the businesses. |

| Land zoning | Area (ha) | Function/observations |
|------------------|-----------|--|
| B7 Business Park | 3 | <ul style="list-style-type: none"> The Area zoned B7 Business Park is located on the eastern side of the Pacific Highway between Campbell Street and Allison Avenue The area comprises a mix of automotive repair, rental and sales businesses, warehousing storage facilities and retailers requiring large floorplates which is very similar to the areas zoned IN1 and IN2. There is also a commercial office building at the northern end of the cluster which differentiates the B7 zoning from the areas zoned industrial. |

3.2 Business and employment

3.2.1 Number of businesses

The study area contains 29,236 businesses distributed across various local centres (based on 2016 ABS data). The estimated number of businesses within each SA2 is identified in Table 3-17. The local centres contributing to businesses within the SA2 vary in size and scale, with North Sydney–Lavender Bay SA2 containing the greatest number of businesses.

Table 3-17: Number of businesses in SA2s

| SA2 Level | Business centres within SA2 | Estimated number of businesses |
|-------------------------------|--|--------------------------------|
| South Harbour Precinct | | |
| Leichhardt–Annandale | Parramatta Road Norton Street Chapman Road working waterfront | 3,283 |
| Lilyfield–Rozelle | Victoria Road/Darling Street, Rozelle Robert Street industrial Catherine Street Convenience James Craig Road working waterfront | 1,806 |
| Balmain | Balmain Main Street (Darling Street, Balmain) | 2,303 |
| North Harbour Precinct | | |
| North Sydney–Lavender Bay | North Sydney | 6,688 |
| Neutral Bay–Kirribilli | Neutral Bay Junction Kirribilli centre | 2,846 |
| Crows Nest–Waverton | Waverton Convenience (Bay Road) Crows Nest | 2,949 |
| Cremorne–Cammeray | Miller Street, Cammeray Military Road, Cremorne | 2,238 |
| St Leonards–Naremburn | Artarmon industrial centre St Leonards | 2,989 |
| Mosman | Spit Junction Military Road, Mosman The Spit | 4,134 |
| TOTAL | | 29,236 |

Source: ABS, 8165.0 – Counts of Australian Businesses, including Entries and Exits June 2016

3.2.2 Industry value added

'Industry Value Added' (IVA) refers to the total value of goods and services produced by an industry, minus the cost of goods and services used in the production process per year. IVA is a more refined measure of economic contribution than gross output as some industries have higher levels of output but require large amounts of input expenditure to achieve that (eg mining versus retail sales)¹.

Small area estimates of IVA (eg at the SA2 level) are not routinely provided by the ABS as part of their standard release. As a result, to estimate local economic activity, HillPDA scaled total Greater Sydney IVA by the most recent industry employment estimates within the study area (ABS place of work – SA2 level).

Using this approach, the study area was found to generate around \$15.6 billion of IVA per year. Comparatively, in June 2016 Greater Sydney IVA was around \$284.5 billion and NSW Gross State Product (GSP) was around \$538.5 billion.

Across the study area the top three industries by IVA are:

- Professional, scientific and technical services
- Financial and insurance services
- Information media and telecommunications.

These represent 20.1 per cent, 20.1 per cent and 11.6 per cent of IVA respectively. Table 3-18 summarises HillPDA's estimates of IVA by industry sector for each of the SA2s within the study area. The values in the table exclude the categories of inadequately described, not stated and not applicable

¹ IVA also excludes taxes less subsidies. HillPDA has also excluded ownership of dwellings, which consists of property owners and owner-occupiers of dwellings. Ownership of dwellings is often excluded for the purpose of land-use and industry analysis.

Table 3-18: Annual industry value added by industry sector (\$million per year, rounded)

| Description | Cremorne– Cammeray | Crows Nest– Waverton | Mosman | Neutral Bay– Kirribilli | North Sydney– Lavender Bay | St Leonards– Naremburn | Balmain | Leichhardt– Annandale | Lilyfield– Rozelle | Total industry contribution | Industry proportional contribution (%) |
|---|-----------------------|-------------------------|--------------|-------------------------------|-------------------------------|---------------------------|--------------|--------------------------|-----------------------|--------------------------------|---|
| Agriculture, forestry and fishing | 0.96 | 0.79 | 1.75 | 1.57 | 7.51 | 3.05 | 2.18 | 0.44 | 0.61 | 18.86 | 0.11% |
| Mining | 0.00 | 0.00 | 2.43 | 0.81 | 43.73 | 21.06 | 1.21 | 0.00 | 0.00 | 69.24 | 0.42% |
| Manufacturing | 5.96 | 16.76 | 14.06 | 11.03 | 158.18 | 150.86 | 10.91 | 54.68 | 24.75 | 447.19 | 2.71% |
| Electricity, gas, water and waste services | 2.05 | 2.63 | 3.51 | 0.88 | 193.49 | 29.27 | 0.00 | 4.10 | 1.17 | 237.1 | 1.43% |
| Construction | 24.46 | 40.53 | 75.23 | 28.30 | 313.39 | 161.29 | 49.96 | 90.60 | 54.85 | 838.61 | 5.07% |
| Wholesale trade | 9.08 | 31.64 | 16.32 | 10.22 | 213.28 | 194.12 | 7.80 | 43.56 | 15.47 | 541.49 | 3.28% |
| Retail trade | 24.76 | 43.24 | 62.41 | 41.21 | 86.35 | 91.30 | 26.41 | 102.73 | 24.70 | 503.11 | 3.04% |
| Accommodation and food services | 30.39 | 44.75 | 53.33 | 43.99 | 92.76 | 33.76 | 31.27 | 41.32 | 23.41 | 394.98 | 2.39% |
| Transport, postal and warehousing | 9.74 | 12.08 | 7.76 | 10.35 | 153.33 | 95.27 | 28.10 | 32.42 | 16.39 | 365.44 | 2.21% |
| Information media and telecommunications | 16.68 | 99.82 | 20.67 | 39.93 | 938.27 | 668.41 | 27.01 | 66.70 | 44.15 | 1921.64 | 11.62% |
| Financial and insurance services | 35.41 | 113.10 | 104.50 | 103.81 | 2370.20 | 415.60 | 52.25 | 44.69 | 75.63 | 3315.19 | 20.06% |
| Rental, hiring and real estate services | 35.23 | 64.48 | 111.65 | 97.92 | 240.91 | 153.14 | 57.91 | 80.90 | 29.55 | 871.69 | 5.27% |
| Professional, scientific and technical services | 50.66 | 196.31 | 111.01 | 189.23 | 1776.23 | 697.70 | 90.02 | 133.36 | 80.34 | 3324.86 | 20.11% |
| Administrative and support services | 20.97 | 29.76 | 34.50 | 22.59 | 337.78 | 103.89 | 20.97 | 36.66 | 44.91 | 652.03 | 3.94% |
| Public administration and safety | 3.47 | 82.42 | 60.46 | 19.54 | 210.50 | 44.27 | 21.27 | 83.58 | 36.41 | 561.92 | 3.40% |
| Education and training | 46.18 | 36.13 | 75.42 | 55.90 | 193.21 | 77.17 | 25.75 | 86.63 | 37.46 | 633.85 | 3.83% |
| Healthcare and social assistance | 31.63 | 139.14 | 81.68 | 57.14 | 126.90 | 591.39 | 61.48 | 102.20 | 83.85 | 1275.41 | 7.72% |
| Arts and recreation services | 7.19 | 10.60 | 61.73 | 14.01 | 71.04 | 24.60 | 10.87 | 18.80 | 14.01 | 232.85 | 1.41% |
| Other services | 11.20 | 20.17 | 33.07 | 18.31 | 83.41 | 87.27 | 14.38 | 35.00 | 22.02 | 324.83 | 1.97% |
| Total | 366.0 | 984.3 | 931.5 | 766.7 | 7610.5 | 3643.5 | 539.8 | 1058.4 | 629.6 | 16,530.29 | |
| SA2 Proportional contribution | 5.6% | 2.2% | 6.0% | 4.6% | 46.0% | 22.0% | 3.3% | 6.4% | 3.8% | | |

Source: ABS place of work and Forecast ID – Greater Sydney Worker Productivity, adapted by HillPDA 2017

Employment by industry

Table 3-19 identifies the employment figures across the study area. Around 118,550 people were employed within the ABS Place of Work 2017 study area. The top three industries of employment were professional, scientific and technical services, healthcare and social assistance, and financial and insurance services, which represented 21.8 per cent, 12.5 per cent and 7.9 per cent of total jobs respectively.

The top three SA2s contributing to employment were North Sydney–Lavender Bay SA2, St Leonards–Naremburn SA2 and Leichhardt–Annandale SA2, which represented 41.3 per cent, 24.8 per cent and 8.8 per cent of total jobs respectively.

Table 3-19: Study area employment by industry sector

| Description | Cremorne– Camberay | Crows Nest– Waverton | Mosman | Neutral Bay– Kirribilli | North Sydney– Lavender Bay | Balmain | Leichhardt– Annandale | Lilyfield– Rozelle | St Leonards– Naremburn | Total employee numbers |
|---|-----------------------|-------------------------|-------------|----------------------------|-------------------------------|-------------|--------------------------|-----------------------|---------------------------|------------------------------|
| Agriculture, forestry and fishing | 11 | 9 | 20 | 18 | 86 | 25 | 5 | 7 | 35 | 216 |
| Mining | 0 | 0 | 12 | 4 | 216 | 6 | 0 | 0 | 104 | 342 |
| Manufacturing | 53 | 149 | 125 | 98 | 1406 | 97 | 486 | 220 | 1341 | 3975 |
| Electricity, gas, water and waste services | 7 | 9 | 12 | 3 | 661 | 0 | 14 | 4 | 100 | 810 |
| Construction | 210 | 348 | 646 | 243 | 2691 | 429 | 778 | 471 | 1385 | 7201 |
| Wholesale trade | 64 | 223 | 115 | 72 | 1503 | 55 | 307 | 109 | 1368 | 3816 |
| Retail trade | 390 | 681 | 983 | 649 | 1360 | 416 | 1618 | 389 | 1438 | 7924 |
| Accommodation and food services | 514 | 757 | 902 | 744 | 1569 | 529 | 699 | 396 | 571 | 6681 |
| Transport, postal and warehousing | 79 | 98 | 63 | 84 | 1244 | 228 | 263 | 133 | 773 | 2965 |
| Information media and telecommunications | 71 | 425 | 88 | 170 | 3995 | 115 | 284 | 188 | 2846 | 8182 |
| Financial and insurance services | 103 | 329 | 304 | 302 | 6895 | 152 | 130 | 220 | 1209 | 9644 |
| Rental, hiring and real estate services | 118 | 216 | 374 | 328 | 807 | 194 | 271 | 99 | 513 | 2920 |
| Professional, scientific and technical services | 408 | 1581 | 894 | 1524 | 14,305 | 725 | 1074 | 647 | 5619 | 26,777 |
| Administrative and support services | 155 | 220 | 255 | 167 | 2497 | 155 | 271 | 332 | 768 | 4820 |
| Public administration and safety | 30 | 713 | 523 | 169 | 1821 | 184 | 723 | 315 | 383 | 4861 |
| Education and training | 556 | 435 | 908 | 673 | 2326 | 310 | 1043 | 451 | 929 | 7631 |
| Healthcare and social assistance | 393 | 1729 | 1015 | 710 | 1577 | 764 | 1270 | 1042 | 7349 | 15,849 |
| Arts and recreation services | 78 | 115 | 670 | 152 | 771 | 118 | 204 | 152 | 267 | 2527 |
| Other services | 151 | 272 | 446 | 247 | 1125 | 194 | 472 | 297 | 1177 | 4381 |
| Inadequately described | 140 | 375 | 289 | 245 | 1517 | 193 | 381 | 213 | 896 | 4249 |
| Not stated | 45 | 96 | 85 | 76 | 607 | 52 | 131 | 68 | 351 | 1511 |
| Total | 3576 | 8780 | 8729 | 6678 | 48,979 | 4941 | 10,424 | 5753 | 29,422 | 127,282 |

Source: ABS place of work 2017

3.3 Maritime activities

Sydney Harbour supports a number of commercial and recreational activities. Of relevance to this study are the businesses that are dependent on the harbour (whether on water or adjacent) to operate. The report, *Our Harbour Our Asset* (Hoisington, 2015) attempts to establish the economic contribution and value of Sydney Harbour, including Middle Harbour. This report has been drawn upon to assist in categorising the types of businesses using the harbour. Table 3-20 categorises examples of the different business functions reliant on the harbour.

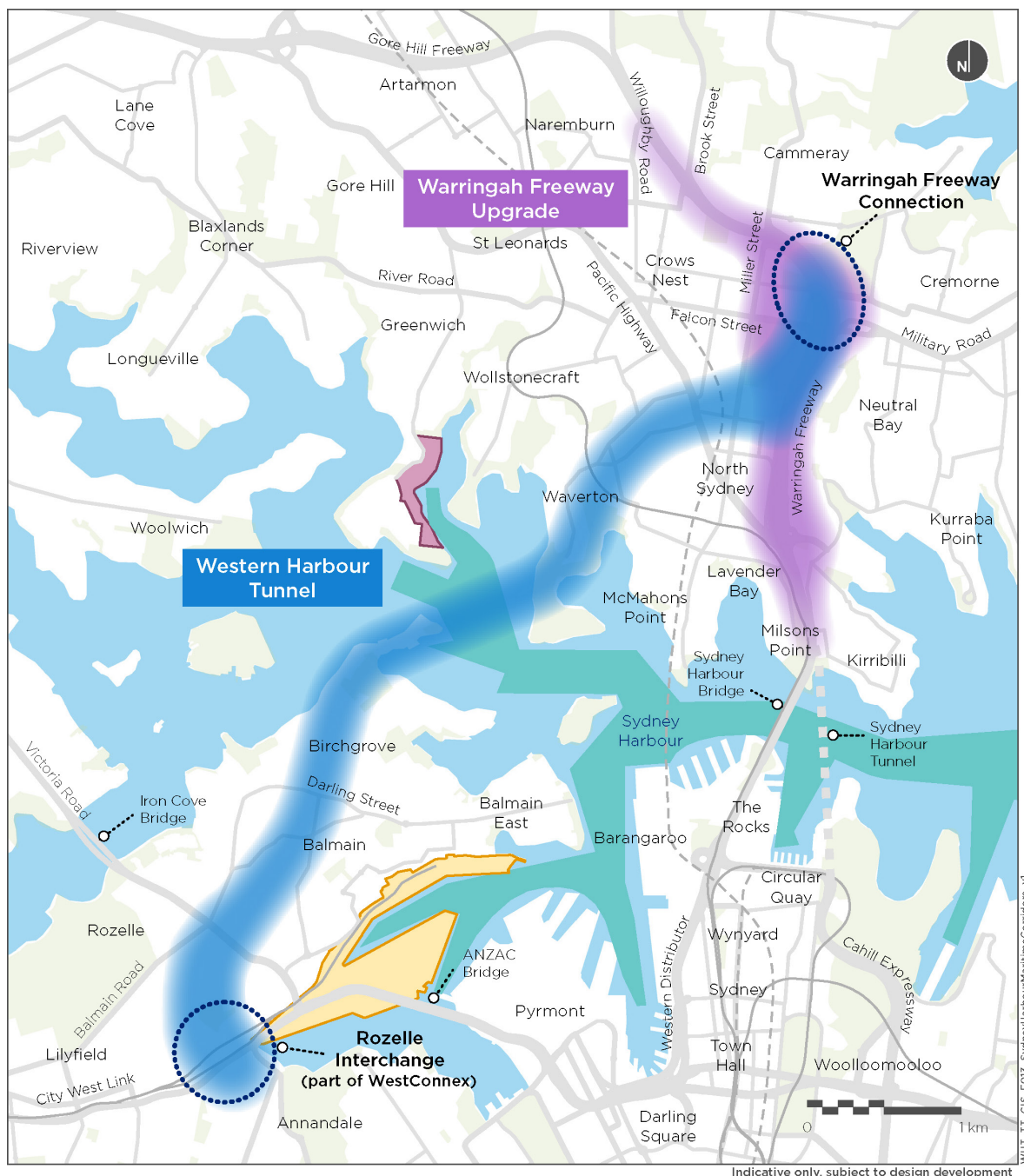
Table 3-20: Business reliant on the harbour for operation

| Harbour function | Example business operations (public and private) |
|------------------|--|
| Ports | Dry bulk imports, general cargo, fuel facility, oil tankers |
| Transport | Public ferries, private ferries and water taxis |
| Navy bases | Defence and training facilities |
| Maritime | Boat moorings, boat licensing, marine rescue, boat maintenance and repairs, tug boats, marina facilities |
| Tourism | Cruise ships, harbour cruises, outdoor recreation and sporting activity operators and hire facilities, recreational boat hire, Sydney Fish Market, seaplane operations |
| Commercial | Commercial fishing movements (commercial fishing is not allowed in the harbour however, boats travel in the harbour to moor and distribute catch), charter boats, science and research, refuelling |

The majority of the business operations listed in the above table are located in areas in and around the study area.

Sydney Harbour is also a leading cruise ship destination and the only port in Australia with two dedicated cruise terminals, one at White Bay and one at Circular Quay. As identified in the Technical working paper: Traffic and transport, cruise ship movements in 2018 were in excess of 230 for the Overseas Passenger Terminal, Circular Quay and 120 for the White Bay Cruise Terminal, Balmain.

Sydney Harbour accommodates major commercial shipping operations, with the primary channels used by commercial vessels identified in Figure 3-16.



- Key**
- Western Harbour Tunnel design development corridor
 - Warringah Freeway Upgrade design development corridor
 - Indicative connection to surface
 - Shipping channel
 - White Bay and Glebe Island port precinct
 - Fuel terminal at Greenwich

- Road network
- Existing rail
- Approved rail
- Park
- Water

Figure 3-16: Maritime corridors in Sydney Harbour

Table 3-21: Summary of key roads – connecting local centres

| Road | Location | Road type and speed limit | Key destinations | Reliant local centres |
|--|---------------------------------|-----------------------------|---|--|
| Artarmon | | | | |
| M1 Gore Hill Freeway | Artarmon, Naremburn, Willoughby | Motorway 80 km/h | Connectivity to the Sydney metropolitan area as part of the Sydney Orbital Network | Miller Street, Cammeray St Leonards–Crows Nest Artarmon Industrial |
| Reserve Road | Artarmon | Collector road 50 km/h | Artarmon commercial areas, Royal North Shore Hospital | Artarmon Industrial |
| Warringah Freeway and North Sydney | | | | |
| Sydney Harbour Bridge (Bradfield Highway/Cahill Expressway) | Sydney CBD, Milsons Point | Motorway 70 km/h | Connectivity to the Sydney metropolitan area as part of the Sydney Orbital Network. | Kirribilli McMahons Point North Sydney St Leonards–Crows Nest Miller Street, Cammeray Military Road – all centres Artarmon |
| Sydney Harbour Tunnel | Sydney CBD, Milsons Point | Motorway 80 km/h | Connectivity to the Sydney metropolitan area as part of the Sydney Orbital Network. | North Sydney St Leonards–Crows Nest Military Road – all centres Miller Street, Cammeray Artarmon |
| M1 Warringah Freeway | North Sydney, Cammeray | Motorway 80 km/h | Connectivity to the Sydney metropolitan area as part of the Sydney Orbital Network. | Kirribilli McMahons Point North Sydney St Leonards–Crows Nest Miller Street, Cammeray Military Road – all centres |
| Pacific Highway | North Sydney, Waverton | Major arterial road 60 km/h | St Leonards, Chatswood, Pymble, Hornsby. Central Coast and Newcastle (via M1 Pacific Motorway). | North Sydney St Leonards–Crows Nest Military Road |

| Road | Location | Road type and speed limit | Key destinations | Reliant local centres |
|-------------------------------------|---------------------------|--|---|--|
| Falcon Street/A8 Military Road | North Sydney, Neutral Bay | Major arterial road 60 km/h | Crows Nest, Mosman, Northern Beaches | Military Road Spit Junction St Leonards–Crows Nest North Sydney |
| Ernest Street | Cammeray, Neutral Bay | Sub-arterial road 50 km/h | Crows Nest, Cremorne, Mosman | Military Road Neutral Bay St Leonards–Crows Nest |
| Miller Street | North Sydney, Cammeray | Sub-arterial road 40 km/h (in North Sydney CBD), 50 km/h elsewhere | Northbridge, Chatswood. Northern Beaches (via Eastern Valley Way/Warringah Road). | North Sydney Miller Street, Cammeray |
| Arthur Street | North Sydney | Sub-arterial road 40 km/h | Provides access from North Sydney to Warringah Freeway southbound. | North Sydney |
| High Street | North Sydney | Sub-arterial road 60 km/h | Provides access between North Sydney, Kirribilli and Neutral Bay. | Kirribilli North Sydney |
| Balls Head Drive/Balls Head Road | Waverton | Local road 10 km/h (Balls Head Drive), 50 km/h (Balls Head Road) | Balls Head Reserve | Waverton |
| Bay Road | Waverton | Local road 50 km/h | Waverton railway station | Waverton |
| Ridge Street | North Sydney | Local road 50 km/h | St Leonards Park. Pedestrian and cycle route linking North Sydney and Neutral Bay via Warringah Freeway overpass. | North Sydney |
| Amherst Street/Warringah Road | Cammeray | Local road 50 km/h | Cammeray Golf Club | Miller Street, Cammeray |
| Berry Street | North Sydney | Sub-arterial 40 km/h | North Sydney Connectivity to the Warringah Freeway | North Sydney |
| Rozelle and surrounds | | | | |
| A40 Victoria Road | Rozelle | Major arterial road 60 km/h | Drummoyne, Gladesville, Ryde, Parramatta | Victoria Road/Darling Street Rozelle |
| A4 City West Link/The Crescent | Rozelle | Major arterial road 70 km/h | Inner West. Sydney Olympic Park, Parramatta, Blacktown, Penrith and the Blue Mountains (via M4 Western Motorway). | Victoria Road/Darling Street Robert Street, Rozelle |
| A4 Anzac Bridge/Western Distributor | Rozelle, Pyrmont | Major arterial road 60 km/h | Sydney CBD, North Sydney | Victoria Road/Darling Street Robert Street, Rozelle |

| Road | Location | Road type and speed limit | Key destinations | Reliant local centres |
|-----------------------------------|------------------|---|---|--------------------------------------|
| Darling Street | Rozelle, Balmain | Collector road 40 km/h north of Victoria Road, 50 km/h south of Victoria Road | Rozelle and Balmain local town centres | Victoria Road/Darling Street Balmain |
| Robert Street | Rozelle | Collector road 40 km/h | White Bay berths 3 to 6 | Robert Street, Rozelle |
| James Craig Road/Sommerville Road | Rozelle | Local road 50 km/h | White Bay Cruise Terminal and other maritime-related land uses in Rozelle Bay, Glebe Island and White Bay | Robert Street, Rozelle |

Source: *Technical working paper: Traffic and Transport* (Jacobs, 2020).

3.4.2 Public transport

The study area is highly serviced by public transport with access to heavy and light rail (south harbour precinct only), bus and ferry services. The information in this section has been informed by the Technical working paper: Traffic and transport.

3.4.2.1 Heavy and light rail

Heavy rail services are provided at Milsons Point, North Sydney, Waverton, St Leonards, and Artarmon railway stations, which are located on the T1 North Shore and Western Line and the T9 Northern Line providing direct connections to Sydney CBD, Parramatta, Chatswood and Hornsby as well as connections via interchange with Sydney Metro Northwest to Macquarie Park, Epping and Norwest. Direct services are also provided to and from the Central Coast from North Sydney during the weekday peak periods.

The heavy rail service supports businesses in the St Leonards–Naremburn SA2, Crows Nest–Waverton SA2, North Sydney–Lavender Bay SA2 and the Neutral Bay–Kirribilli SA2. This includes the business centres of North Sydney, Kirribilli, Waverton, St Leonards and around the Artarmon industrial estate.

Light rail services are provided at the Lilyfield stop and the Rozelle Bay stop, which is located near the intersection of City West Link and The Crescent. The L1 Dulwich Hill Line provides direct connections to Pyrmont, Leichhardt, and Central and Dulwich Hill railway stations. There are about 300 timetabled services on weekdays and 200 services on weekends and public holidays.

Due to the location of the line, the light rail service would likely only support the Leichhardt–Annandale SA2 and the Lilyfield–Rozelle SA2. Business centres that may benefit from connection to the light rail are those at Catherine Street at Lilyfield, Robert Street at Rozelle and Victoria Road/Darling Street at Rozelle.

Sydney Metro is made up of two stages, incorporating three projects, the Stage 1 Sydney Metro Northwest opened 26 May 2019, Stage 2 City and Southwest which includes Chatswood to Sydenham project anticipated to open in 2024 and the Sydenham to Bankstown upgrade. The Sydney Metro Chatswood to Sydenham route runs through the study area with stations at Crows Nest and North Sydney (Victoria Cross). Construction of the Chatswood to Sydenham component of the Sydney Metro project involves tunnelling under the harbour from Barangaroo to Blues Point.

3.4.2.2 Bus

All centres within the study area have access to a major or local bus service. The study area, north of the Harbour Bridge, is well serviced by buses with 108 unique routes and about 4,900 individual timetabled services on weekdays, 2,300 services on Saturdays, and 1,900 services on Sundays and public holidays. Bus services are operated by Sydney Buses, Forest Coach Lines, Hillsbus and Transdev NSW. Major bus corridors in the Warringah Freeway and North Sydney area include:

- Warringah Freeway – for services to Sydney CBD, Northern Beaches, North Shore and the Hills District
- Military Road – for services to Mosman and the Northern Beaches
- Pacific Highway – for services to Chatswood, Epping and the Hills District
- Miller Street – primary bus corridor for services to and from North Sydney.

The Balmain/Rozelle area is also a major thoroughfare for buses with 26 unique routes and about 1,700 individual timetabled services on weekdays, 1,000 services on Saturdays and 800 services on Sundays and public holidays. Bus services are operated by Sydney Buses. Victoria Road and Anzac Bridge are major bus corridors for services to Sydney CBD, the Inner West, Ryde, Macquarie Park and Parramatta.

3.4.2.3 Ferry

A number of public ferries also use the Sydney Harbour waterways close to the study area. Circular Quay, Barangaroo and Pyrmont Bay are all primary employment destinations with various ferry routes which traverse the study area. As can be seen in Figure 3-18, Sydney Ferries routes that cross the study area include the Parramatta River ferry, Cross Harbour ferry and the Cockatoo Island ferry.

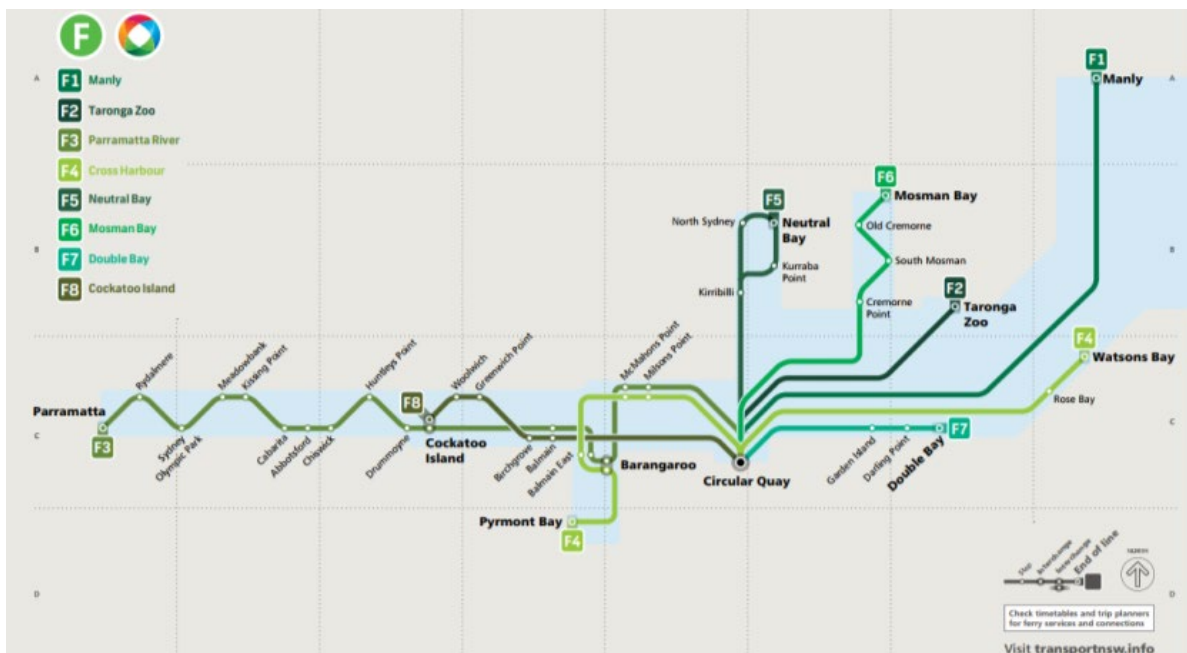


Figure 3-18: Sydney Ferries Network

Ferry services in the study area are provided from wharves located in Balmain, Balmain East, Birchgrove, McMahon's Point and Milsons Point. These wharves are served by the F3 Parramatta River Line that provides direct connections to Circular Quay, Barangaroo and locations along the Parramatta River. Balmain East wharf is also served by the F4 Cross Harbour Line that provides direct connections to Circular Quay, Barangaroo, McMahon's Point, Milsons Point, Pyrmont Bay, Rose Bay and Watsons Bay. There are about 100 timetabled services on the F3 Parramatta River Line on

weekdays and 80 services on weekends and public holidays. There are about 80 timetabled services on the F4 Cross Harbour Line on weekdays and 90 services on weekends and public holidays.

3.4.3 Active transport

The pedestrian network in the study area is well-developed with footpaths provided alongside the vast majority of roads and controlled crossings provided at most signalised intersections.

According to the Technical working paper: Traffic and transport, relatively high levels of pedestrian activity occur:

- In the vicinity of commercial and retail land uses in North Sydney CBD
- In the vicinity of numerous schools located west of the Pacific Highway and along Miller Street at Cammeray
- Around Balls Head Reserve at Waverton, due to people involved in exercise activities
- In the vicinity of Rozelle and Balmain local town centres along Victoria Road and Darling Street at Rozelle
- In the vicinity of schools located off Darling Street at Rozelle.

The Warringah Freeway presents an impediment to east-west movements for pedestrians and cyclists. Pedestrians are prohibited from walking along the Warringah Freeway, with crossings only available at select locations including:

- Ernest Street at Neutral Bay
- Shared user bridge connecting Falcon Street in North Sydney and Merlin Street in Neutral Bay
- Falcon Street at North Sydney
- Shared user bridge connecting Ridge Street in North Sydney and Alfred Street North in Neutral Bay
- Mount Street at North Sydney
- High Street at North Sydney.

In Rozelle, two shared user bridges span Victoria Road – one about 90 metres north of The Crescent and the other about 70 metres east of The Crescent.

All of these shared user bridges accommodate a large proportion of commuter trips travelling to Sydney CBD and North Sydney CBD.

The cycle network across the study area predominantly consists of on-road cycle routes on local, collector and sub-arterial roads. Some off-road shared user paths are provided in Rozelle along Victoria Road, Anzac Bridge and the foreshores of Iron Cove, Rozelle Bay and Blackwattle Bay.

3.4.4 Modes of travel

Travel to work data for the study area is garnered from ABS 2016 census. The data reveals that car travel was the predominant mode of travel to work for residents with 37 per cent using a car as a driver or a passenger. This was lower than the Greater Sydney average of 57 per cent. The second most common form of transport was by bus, with 17 per cent of residents travelling to work using this method. This was higher than the Greater Sydney average of 6 per cent.

Compared to Greater Sydney, the study area recorded a marginally lower proportion of other vehicle users (for example truck, motorbike and taxi). The study area had a relatively high proportion of people who worked from home and a lower proportion of people who did not go to work, compared to Greater Sydney.

The proportion of those travelling to work using one, two or three modes of transport was similar in the study area and Greater Sydney. Seventy-nine per cent used one mode of transport in the study area, while 80.6 per cent did in Greater Sydney. The proportion of those using two methods of transport was 11.3 per cent in the study area and 13.2 per cent in Greater Sydney.

Table 3-22: Travel to work data

| Method of travel | South Harbour Precinct (%) | North Harbour Precinct (%) | Study Area (%) | Greater Sydney (%) |
|---|----------------------------|----------------------------|----------------|--------------------|
| One mode | | | | |
| Train only | 2.1 | 13.5 | 9.6 | 10.9 |
| Bus only | 18.4 | 16.5 | 17.2 | 5.5 |
| Other public transport | 5.2 | 2.3 | 3.3 | 0.7 |
| Car only (as driver or passenger) | 41.4 | 35.1 | 37.2 | 56.6 |
| Walked or cycled | 8.4 | 10.4 | 9.7 | 4.8 |
| Truck | 0.3 | 0.1 | 0.2 | 0.9 |
| Motorbike/scooter | 1.5 | 0.9 | 1.1 | 0.7 |
| Other one mode | 0.7 | 0.6 | 0.7 | 0.5 |
| Two modes | | | | |
| Train and car (as driver or passenger) | 0.4 | 0.4 | 0.4 | 1.8 |
| Train and one other method | 4.1 | 4 | 4 | 4.7 |
| Bus and car (as driver or passenger) | 0.5 | 0.4 | 0.4 | 0.3 |
| Bus and one other method | 6.4 | 5.6 | 5.9 | 5.8 |
| Other two modes | 0.8 | 0.6 | 0.6 | 0.6 |
| Three modes | | | | |
| Train and two other modes | 0.6 | 0.8 | 0.7 | 0.6 |
| Bus and two other modes (excluding train) | 0.2 | 0.1 | 0.1 | 0 |
| Other three modes | 0.1 | 0 | 0.1 | 0 |
| Other | | | | |
| Worked at home | 6.5 | 6.6 | 6.5 | 4.4 |
| Did not go to work | 7.6 | 6.7 | 7 | 7.8 |
| Modes of travel not stated | 0.7 | 0.6 | 0.6 | 0.9 |

Source: ABS Census data 2016

3.5 Amenity

3.5.1 Noise

Changes in environmental noise may impact (positively or negatively) on business amenity and ambience.

The Technical working paper: Noise and Vibration documents the existing acoustic environment of the project, including measured background noise levels and measured road traffic noise levels. The sensitivity of commercial and industrial receivers to noise related impacts depends on the occupancy type and dependency on outdoor use. For instance, a café or restaurant that has outdoor seating may be more sensitive to noise than heavy industrial premises.

The noise and vibration assessment defines noise management levels for airborne noise and ground-borne noise. The noise management levels are derived from the rating background level plus 10 dB(A).

Airborne noise management levels at commercial premises (including offices and retail outlets) and industrial premises are 70dB(A) and 75dB(A) respectively. Ground-borne noise management levels at commercial premises (including offices) is 50dB(A) internal, commercial premises (including retail) is 60dB(A) internal and industrial premises is 65dB(A) internal. The noise level represents the point above which there may be some reaction to noise.

The following table identifies the measured background noise levels close to a business centre.

Table 3-23: Measured background noise levels close to a business centre

| Address | Closest business centre | Rating Background Level, dB(A) | | |
|---------------------------------------|------------------------------|--------------------------------|-----------------------|---------------------|
| | | Day (7am-6pm) | Evening (6pm-10pm) | Night (10pm-7am) |
| 31 Cambridge Street, Rozelle | Darling Street/Victoria Road | 43 | 41 | 34 |
| C13/1 Buchanan Street, Balmain | Robert Street Industrial | 49 | 49 | 46 |
| 23 Smith Street, Rozelle | Robert Street Industrial | 42 | 44 | 38 |
| 401/102 Alfred Street, Milsons Point | North Sydney Kirribilli | 60 | 60 | 50 |
| 6 McDougall Street, Kirribilli | Kirribilli | 55 | 54 | 45 |
| 1/191-195 Walker Street, North Sydney | North Sydney | 73 | 71 | 55 |
| 91 Ridge Street, North Sydney | North Sydney | 52 | 52 | 45 |
| 306 Miller Street, North Sydney | North Sydney | 52 | 47 | 36 |
| 1/1 Bardsley Gardens, Crows Nest | St Leonards–Crows Nest | 53 | 49 | 41 |
| 288 Falcon Street, Neutral Bay | Military Road, Neutral Bay | 61 | 54 | 44 |
| 5 Military Road, Neutral Bay | Military Road, Neutral Bay | 58 | 54 | 44 |
| 53 Bellevue Street, Cammeray | Miller Street, Cammeray | 64 | 63 | 47 |
| 20/2 Parkes Road at Artarmon | Artarmon industrial | 67 | 63 | 46 |

Source: Adapted from Renzo Tonin and Associates, Technical working paper: Noise and Vibration (Renzo Tonin, 2020).

The existing traffic noise levels at the monitoring locations where road traffic was the dominating noise source is summarised in Table 3-24 where relevant to business centres.

Table 3-24: Measured traffic noise levels where relevant to business centres

| Address | Closest business centre | Measured road traffic noise level, dB(A) | |
|---------------------------------------|----------------------------|--|--------------------------------------|
| | | L _{Aeq,15hour} (7am–10pm) | L _{Aeq,9hour} (10pm–7am) |
| 6 McDougall Street, Kirribilli | Kirribilli | 62 | 58 |
| 1/191-195 Walker Street, North Sydney | North Sydney | 79 | 74 |
| 91 Ridge Street, North Sydney | North Sydney | 60 | 54 |
| 306 Miller Street, North Sydney | North Sydney | 67 | 61 |
| 1/1 Bardsley Gardens, Crows Nest | St Leonards–Crows Nest | 70 | 66 |
| 288 Falcon Street, Neutral Bay | Military Road, Neutral Bay | 71 | 68 |
| 5 Military Road, Neutral Bay | Military Road, Neutral Bay | 74 | 70 |
| 20/2 Parkes Road at Artarmon | Artarmon industrial | 74 | 69 |

Source: Adapted from Renzo Tonin and Associates, Technical working paper: Noise and Vibration (Renzo Tonin, 2020).

3.5.2 Landscape character

The Technical working paper: Urban design, landscape character and visual impact assessment describes the urban and landscape character along the project corridor. Much of the project corridor consists of low, medium and high-density residential zoning, interspersed with industrial and commercial cores such as North Sydney and Artarmon.

The landscape characters of three precincts have been described in the report.

Rozelle precinct

This inner-city precinct is dominated by relatively low-density residential development and remnant industrial areas, slated for future development as part of the Bays precinct. The precinct has a large section of shoreline and strong visual links with the harbour. There are several key areas of public open space including the waterfront Jubilee Park and the proposed open space at the Rozelle Rail Yards (part of the approved M4-M5 Link).

North Sydney precinct

North Sydney is a mixed-use area, centred on St Leonards Park. The Warringah Freeway cuts through the area creating east–west separation of the precinct both visually and physically. North Sydney CBD forms a western edge to the precinct with large towers rising above the Freeway. Adjacent residential areas include neighbourhoods of Cammeray with ongoing densification of North Sydney.

The reference design involves the re-alignment of the freeway from the northern end of Sydney Harbour Bridge to Willoughby Road, to allow for connections to and from both the new Western Harbour and Beaches Link tunnels. Adjustments to existing surface ramp connections to and from Warringah Freeway and upgrades to the surrounding local road network are also part of the design in order to provide operational efficiency to the corridor.

Artarmon precinct

Artarmon is a mixed-use urban area with residential land use in the north and industrial and institutional land use to the south. The depressed configuration of the Gore Hill Freeway allows visual connectivity across the road while restricting pedestrian connectivity. Despite urban development, the Gore Hill Freeway has a discernible green edge with Artarmon Reserve and oval alongside the roadway.

4.0 BUSINESS SURVEY

The following section presents the findings of the business survey. The business survey gauged the perception of a sample of businesses across the study area to potential impacts associated with construction and operation (refer to section 2.4 for business survey methodology and Appendix B of this report for the survey report). At the time of the survey, limited information was available regarding project alignment and design. Only publicly available information regarding the project was provided to the survey respondents to inform their responses. This included the initial design and preliminary planning information. This section draws on the comments and information gathered by the business survey to characterise the sensitivities and dependencies of business types to the issues scoped. The survey methodology is discussed in section 2.4, business survey itself can be found in Appendix A, while a summary of all survey results can be found in Appendix B of this report.

It is important to note that the below section outlines the business' perceptions of the impacts the project will have, while an assessment of modelled impacts on businesses is provided in section 5.0 and section 6.0 below.

4.1 Passing trade

Passing trade may be defined as those pedestrians, cyclists and motorists who choose to patronise a business because they see it when walking, riding or driving past, and they had not previously planned to go there. The business survey sought information on customer travel choices to determine how changes in passing trade may impact on businesses.

Business survey findings highlighted a high dependency on motor vehicle passing trade:

- Seventy-five per cent of surveyed businesses perceived a dependency on motor vehicle passing trade with 43 per cent highly dependent. Twenty-five per cent of surveyed businesses suggested they were not dependent on motor vehicle passing trade
- Balmain Main Street and Victoria Road/Darling Street were the surveyed business centres that recorded the highest dependencies on motor vehicle passing trade
- Retail trade, manufacturing and construction were the business types most dependent on motor vehicle passing trade.

Business survey findings highlighted a high dependency on pedestrian and cyclist passing trade:

- Eighty-four per cent of surveyed businesses believed themselves dependent on pedestrian and cyclist passing trade, with 66 per cent of these being majorly dependent. Fifteen per cent of businesses believed they were not dependent
- Victoria Road/Darling Street at Rozelle and North Sydney were the surveyed business centres that recorded the highest belief in dependence upon pedestrian and cyclist passing trade
- Accommodation and food services and retail trade were the business types believed to be the most dependent on pedestrian and cyclist passing trade.

Construction

During the construction phase, hoardings and changes to vehicle, pedestrian and cyclist flows may influence the level of passing trade. The business survey indicated:

- The majority (64 per cent) of businesses believed there to be neither a positive nor negative impact on passing trade during the construction phase
- Twenty-eight per cent of respondents believed construction would negatively impact passing trade

- Eight per cent believed construction would improve passing trade
- Businesses in Cammeray and Victoria Road/Darling Street at Rozelle were the most likely to believe there will be a negative impact on their passing trade during construction (35 and 45 per cent respectively)
- Businesses in North Sydney (15 per cent) and Balmain (13 per cent) were the most likely to believe there will be a positive impact on their passing trade during construction.

Operation

Businesses were asked about the potential for changes to vehicle, pedestrian and cyclist flows which may influence the level of passing trade at some business centres once the project is operational. The business survey found:

- Businesses in North Sydney, Military Road, Victoria Road/Darling Street, Robert Street, Cammeray and Spit Junction believed that the operation of the project would have a positive outcome for passing trade, upon operation. The highest positive responses were recorded in Cammeray (59 per cent) and North Sydney and Victoria Road/Street (both 58 per cent)
- Some businesses along Military Road (15 per cent) and Spit Junction (13 per cent) believed that the operation of the project would have a negative impact on passing trade.

Section 5 identifies and assesses the business centres where construction and operational effects have the capacity to affect passing trade.

4.2 Employee and customer access

Alterations to employee and customer access and travel time may affect business operations during construction due to delayed or hindered access to workplaces, owing to traffic constraints such as congestion, alterations to travel routes and parking accessibility.

4.2.1 Accessibility alterations

Customer journey

Customers would choose between centres that offer similar goods or services. Changes in access to a centre, for example through reconfigurations of connectivity to centres, may result in long-term changes to consumer behaviour and permanent economic impacts (positive or negative) for certain local businesses. The business survey found:

- The majority of business respondents indicated that their customers were from the local suburb (58 per cent), 19 per cent indicated they serviced the LGA, nine per cent were travelling from the broader district and 14 per cent from Greater Sydney or wider
- Customers travelling to a local centre were generally travelling by private vehicle (37 per cent) or walking (25 per cent)
- In terms of mode of travel, thirty-five per cent of business respondents indicated that there was a balance between customers walking and travelling by vehicle
- Public transport was not a preferred travel method for customers with only three per cent of respondents suggesting customers travelled by this method.

These results reflect the trade catchments of the business centres.

Employee journey

The ease of access to a place of employment may also be a factor in attracting or deterring existing or potential employees from remaining in a job or applying for a job. If a place of work becomes too difficult to access, individuals may seek alternative employment options in response to the restricted time available to spend with family and friends or in non-work-related activities. As such, employers

may have difficulty attracting or retaining staff, which may affect business productivity and function. Alternatively, if access to a particular centre is improved, businesses may be more likely to attract employees. The business survey findings suggested:

- Thirty-four per cent of employees were travelling to work using multiple forms of transit, 30 per cent were travelling by private vehicle only, 28 per cent were travelling by public transport and eight per cent were travelling by active transport.

When asked if their business was sensitive to employee travel time delays:

- Eighty per cent perceived that they were sensitive, with 45 per cent of the respondents perceived to be majorly sensitive. Twenty per cent of respondents indicated that their business was not sensitive
- Waverton and Robert Street, Rozelle business centres were perceived to be the most sensitive with 51 per cent and 40 per cent of businesses respectively stating they were sensitive to travel time delays
- Personal services (85 per cent), healthcare and social assistance (39 per cent) and commercial businesses (39 per cent) were perceived as the most sensitive to travel time delays.

Construction

Within the study area, the construction phase of the project would result in changes in certain areas to road, public transport and active transport networks, which may affect employee and customer access. Business survey responses were provided based on perceptions regarding high level information at the time. The responses indicated that:

- Sixty-four per cent believed construction of the project would have no discernible effects on travel time and access
- Thirty-one per cent believed the construction phase would have a negative effect and five per cent predicted a positive effect on customer and employee access
- Balmain and Cammeray recorded the most positive responses predicting an improvement in access, both at 12 per cent
- Cammeray, Victoria Road/Darling Street, Rozelle and Balmain recorded the most negative responses predicting a decline in access at 47, 35 and 35 per cent respectively.

Operation

The operation of the project would result in changes to vehicle, pedestrian and cyclist flows and road configuration due to the new road, public transport and active transport infrastructure. This may potentially impact access to particular centres as well as travel times for customers and employees. Business survey responses were provided based on perceptions regarding high level information at the time. The responses indicated that:

- Fifty per cent of business respondents located in the business centres believed that there would be a positive impact on employee and customer access once the project is operational.
- Five per cent of businesses believed that there would be a negative impact on access from the operation of the project
- The largest positive response was recorded in Cammeray (59 per cent) followed by North Sydney and Victoria Road/Darling Street (both 58 per cent)
- Businesses located in Spit Junction (13 per cent) and Military Road (12 per cent) recorded the most negative responses.

Section 5 identifies and assesses the business centres where construction and operational effects have the capacity to influence employee and customer access and travel time.

4.2.2 Parking accessibility

The removal or increased competition for car parking has the potential to impact convenience for workers, clients and customers. These changes have the potential to influence decisions by customers/clients to use a certain business. If there are competing centres in more easily accessible locations that offer similar goods or services, the lack of parking may result in changed consumer behaviour and lost revenue opportunity for businesses.

Changes to parking availability may affect the daily routine of a business, level of activity, passing trade or business operations. Permanent reductions in on-street parking may deter visitors from accessing a business due to an increase in travel time and lack of convenience and may affect the vibrancy of a centre. Business survey responses indicated that:

On-street parking

- The majority of businesses (84 per cent) were dependent on on-street parking, with 63 per cent of these businesses recording major dependency. Sixteen per cent of businesses identified no dependency on on-street parking
- The business centres of Spit Junction, Victoria Road/Darling Street and Miller Street, Cammeray were most dependent on on-street parking
- Commercial, healthcare and social assistance, manufacturing, personal services, recreation services/fitness and retail trade business types recorded a higher dependency on on-street parking.

Convenient customer parking

- Convenient customer parking was considered a dependency for 74 per cent of businesses, with 54 per cent of respondents indicating a major dependency on convenient customer parking. Conversely, 27 per cent of businesses were not reliant on customer parking to support business functions
- The business centres of Miller Street, Cammeray, Spit Junction, Robert Street, Rozelle and Victoria Road/Darling Street at Rozelle were most dependent on convenient customer parking
- One hundred per cent of manufacturing and recreational services/fitness businesses stated a dependency on convenient customer parking. Commercial and personal services businesses were dependent on convenient customer parking.

Of the businesses surveyed, 67 per cent did not have designated parking and would rely on public spaces. Eighteen per cent of businesses surveyed had one or two car spaces, six per cent had three to five car spaces, three per cent had six to 10 car spaces and three per cent had 11 to 20 car spaces. Three per cent of the business respondents indicated they shared car spaces with a mall or other private area.

Section 5 identifies and assesses the business centres where construction and operational effects have the capacity to influence the availability of car parking for employees and customers.

4.3 Servicing and delivery

Businesses rely on deliveries to support the sale of products and services, as well as relying on services from other businesses, such as refuse collection. These activities are often required to occur daily, and in some cases, multiple times per day. It therefore follows that temporary street closures, travel time alterations and alterations to car parking and loading zones could collectively or individually hinder servicing and delivery opportunities. This may temporarily impact travel times and vehicle-related costs as well as revenue for businesses.

Some business types are likely to be more affected by changes to access than others, particularly those that rely on efficient deliveries or distribution. The business survey responses indicated:

- Seventy-five per cent of businesses believe they were sensitive to congestion, 79 per cent to travel time delays and 55 per cent indicated a dependency on loading zones. Any alterations to the performance of the road network or relocation or removal of loading zones would have a greater likelihood of affecting the servicing and delivery capacity of businesses
- The business centres of Waverton (93 per cent), Robert Street, Rozelle (73 per cent) and Spit Junction and Victoria Road/Darling Street (both at 69 per cent) indicated that they were most sensitive to travel time delays. Personal services were the business type most sensitive to travel time delays (85 per cent) followed by commercial and healthcare and social assistance, both at 70 per cent
- Waverton and Victoria Road/Darling Street businesses indicated that they were most sensitive to congestion at 93 per cent and 69 per cent of businesses respectively stating they were sensitive. Personal services businesses were most sensitive to congestion with 74 per cent stating they were sensitive, followed by retail trade at 63 per cent
- The business centres of Miller Street, Cammeray and Robert Street, Rozelle indicated higher dependencies on loading zones with 61 and 64 per cent respectively being sensitive. However, no locations as a whole, recorded major dependencies. Of all businesses surveyed, 33 per cent had major dependencies, of which manufacturing (100 per cent), retail trade (57 per cent) and wholesale (50 per cent) were the most dependent.

Construction

The construction phase of the project may result in changes to loading zones, road performance and road network configuration in specific locations, which may have temporary effects on the reliability and capacity of servicing and delivery. Survey responses indicated that during construction:

- Sixty-four per cent of businesses believed the construction phase of the project would have a neutral effect on the servicing and delivery operations of their business. Thirty-four per cent of business thought it would have a negative effect and two per cent thought it would be positive
- The centres of Robert Street at Rozelle (67 per cent), Miller Street at Cammeray (53 per cent) and Balmain (41 per cent) recorded the highest number of negative responses.

Operation

The operation of the project may result in changes to traffic flows and has the potential to impact the location and availability of loading zones in particular locations. This may influence servicing and delivery of goods, with some businesses potentially benefiting from improved conditions while others may not. Of the businesses surveyed:

- About 47 per cent stated that the operation of the project would have a positive effect on servicing and delivery, 49 per cent stated the effect would be neutral and four per cent stated it would be negative
- The centres of Miller Street at Cammeray (61 per cent), Victoria Road/Darling Street at Rozelle (58 per cent) and North Sydney (55 per cent) recorded the highest number of positive responses
- Businesses in the centres of Military Road and Spit Junction were the most likely to perceive negative effects to servicing and delivery from the operation of the project, with 13 and 12 per cent of businesses respectively perceiving the effects would be negative.

Section 5 identifies and assesses the business centres where construction and operational effects have the capacity to affect the efficiency of servicing and delivery.

4.4 Character and amenity

Amenity is generally associated with the pleasantness of an area or business environment, but also has a physical (or tangible) component. This includes the character and appearance of buildings, proximity to commercial or recreational facilities, quality infrastructure and absence of noise, unsightliness or offensive odours. It also has a psychological or social component.

The local character and amenity of a place can affect the enjoyment and desirability of the environment, visitation numbers and trends, and consequently the economic activity of a commercial centre and the businesses located there. Of the businesses surveyed:

- Eighty per cent stated that they were dependent on the identity and character of their commercial centre (43 per cent majorly dependent). Sixty-five per cent identified that they were dependent on a pleasant visual amenity (38 per cent majorly dependent)
- Thirty-one per cent of businesses had low to moderate sensitivity to noise and 18 per cent had high sensitivity. However, the categories of personal services, accommodation and food services (including cafés and restaurants) and healthcare and social assistance were perceived to be more sensitive to noise. Business centres that believed they would be more sensitive to changes in the acoustic environment were North Sydney and Victoria Road/Darling Street at Rozelle
- Twenty-seven per cent of businesses had low to moderate dependency on visual amenity, on which the categories of accommodation and food services and personal services were believed to be most dependent. Business centres that believed they are most dependent on pleasant visual amenity were Cammeray, North Sydney and Victoria Road/Darling Street
- Twenty-seven per cent believed they had low to moderate sensitivity to diminished air quality and 39 per cent believed they had high sensitivity. However, the category of personal services, accommodation and food services and retail trade were believed to be most sensitive to air quality alterations. Business centres that believed they are most sensitive to changes in the air quality of an environment were Cammeray, North Sydney and Victoria Road/Darling Street
- Nineteen per cent of businesses had low to moderate sensitivity to odour and 37 per cent had high sensitivity. However, the category of personal services was understood to be the most sensitive to odour. Business centres that believed they would be more sensitive to odour were Cammeray, Victoria Road/Darling Street, North Sydney and Waverton.

Construction

Construction works have the potential to temporarily affect the amenity of an environment by altering the appearance of buildings through installation of construction hoardings, noise, odours, construction equipment, unsightliness, the removal of established vegetation, installation of acoustic sheds, fencing, and the visual appearance of temporary construction support sites. These impacts would affect the overall amenity of the business environment and may impact where a person visits or purchases goods and services during the construction phase.

Construction may also generate noise levels that impede communication. This can affect the function of businesses that require interaction between customers and employees. Businesses such as retail, food and beverage services or telecommunication may experience communication difficulties during highly noisy activities, reducing the ability for employees to hear orders or conduct conversations, potentially increasing the instances of errors or reducing the number of sales.

Noise exceedances have the potential to reduce employee productivity as staff may have greater difficulty concentrating on a task or may experience a reduction in their health and wellbeing (ie headaches, increased stress and anxiety). This may potentially affect productivity, efficiency and revenue capacity of businesses, particularly if the construction activities continue for extended periods.

Food and beverage services that rely on outdoor dining may be particularly sensitive to quiet outdoor environments. Of the businesses surveyed:

- Eighty-one per cent stated the effect of the construction phase on the amenity of their business would be neutral. Two per cent stated the effect would be positive, while 16 per cent stated that the effect would be negative
- Military Road (seven per cent positive), Miller Street at Cammeray (six per cent positive) returned the highest rate of positive responses
- Victoria Road/Darling Street at Rozelle (32 per cent negative) and Miller Street, Cammeray and Spit Junction (both 18 per cent negative) returned the highest rate of negative responses.

Operation

Operation of the project has the potential to alter the amenity and character of the environment via the removal and addition of infrastructure, alterations to landscaping and urban design features, increases or reduction in noise generators and air quality. These changes may affect the long-term visitation patterns of a business area. Of the businesses surveyed:

- Sixty-three per cent stated that the effect of project operation on the amenity of their business would be neutral. Thirty-six per cent stated the effect would be positive, while one per cent stated that the effect would be negative
- The highest rates of positive responses were at Miller Street, Cammeray (59 per cent positive), Victoria Road/Darling Street (51 per cent positive) and North Sydney (48 per cent positive)
- The highest rates of negative responses were at North Sydney (three per cent negative) and Victoria Road/Darling Street (three per cent negative).

Section 5 identifies and assesses the business centres where construction and operational effects have the capacity to affect the character and amenity of a business environment.

4.5 Business visibility

A change in pedestrian or vehicle routes and traffic volumes may potentially impact, positively or negatively, the exposure of businesses to potential clients. Businesses that rely on storefront exposure to attract customers may be affected by the presence of construction hoardings or reduced visibility of business advertising. A change in pedestrian or vehicle routes and traffic volumes may affect the exposure of businesses to potential clients.

Business survey results indicated that:

- Ninety-one per cent of businesses were dependent on business exposure and visibility with 62 per cent of those majorly dependent. Only eight per cent of business respondents suggested they were not dependent
- Miller Street, Cammeray, Military Road, North Sydney Spit Junction and Victoria Road/Darling Street were the surveyed business centres that recorded the highest dependencies
- Personal services, recreational services/fitness and retail trade were the business types most dependent on business exposure and visibility.

Construction

The construction phase of the project would result in changes to vehicle, pedestrian and cyclist flows and in turn influence the level of business exposure and visibility. Some businesses could benefit as they might be exposed to more potential customers (ie through pedestrian or traffic diversions) while others might not, as traffic is diverted away or construction hoardings reduce the ease of access to, or visibility of their business.

The business survey results indicated that:

- The majority of businesses (83 per cent) believed there would be a neutral effect from the construction phase on business exposure and visibility, 15 per cent believed construction would negatively affect business exposure and visibility, and three per cent believed business exposure and visibility would be affected positively
- All businesses (ie 100 per cent of those surveyed) in Balmain and Waverton believed their exposure and visibility would be neutrally affected by construction. Businesses in Cammeray and North Sydney indicated a negative response of 24 and 23 per cent respectively, while small numbers of businesses in three centres stated construction would have a positive impact (three per cent in Victoria Road/Darling Street, seven per cent along Military Road and 12 per cent in Cammeray).

Operation

Upon operation, the project would result in changes to vehicle, pedestrian and cyclist flows. This may influence the level of business visibility and exposure at some locations with some businesses benefiting as potential customers are redirected towards their business, while others may not as vehicular traffic bypasses the centre.

The business survey results indicated that:

- The majority of businesses (62 per cent) believed there would be a neutral impact from the operation of the project on business exposure and visibility. Thirty-one per cent of businesses believed business exposure and visibility would be positively affected and four per cent believed operation would be negatively affected
- Cammeray (59 per cent) and Robert Street at Rozelle (47 per cent) anticipated the largest positive change in business exposure and visibility. The largest negative effect was predicted to occur among businesses along Military Road (17 per cent negative response).

Section 5.0 identifies and assesses the business centres where construction effects have the capacity to affect business exposure and visibility.

4.6 Demand for goods and services

The demand for goods and/or services can be described as the willingness and ability of buyers or consumers to purchase goods and services. The construction and operation of projects have the potential to directly and indirectly impact local and regional demand for goods and services. The business survey indicated that the majority of businesses believed the project would have a neutral effect on demand for goods and services.

Construction

The survey identified that the vast majority of businesses in the study area believed that construction would have a neutral effect on demand for services and products. The business survey found:

- Ten per cent of businesses perceived that demand for their goods and services would be negatively impacted during the construction phase of the project as a result of affected customers avoiding the area due to temporary construction support sites. Others stated they would benefit from increased trade from construction workers in the area. Infrastructure projects can also boost demand for some services, such as construction recruitment agencies, construction companies and resource suppliers, creating employment opportunities both within and outside local business centres
- As a consequence of the increase in workers associated with construction of the project, the business survey identified that the largest benefits from increased trade are anticipated for convenience retail and the food and beverage industry. Surveyed businesses in Cammeray (18 per cent) and North Sydney (eight per cent) were more likely to perceive a benefit from

the construction of the project as a result of increased trade from construction workers in the area

- 24 per cent of businesses in Cammeray and 19 per cent of businesses in Victoria Road/Darling Street believed that they would experience reduced demand for services as a result of the construction of the project.

Operation

Business centres that experience alterations in access and connectivity, local amenity and population characteristics often experience alterations in demand for services upon operation of major infrastructure projects.

Businesses surveyed were asked to indicate how they believed the operation of the project would affect the overall demand for their services or products. The business survey found:

- The majority (65 per cent) of businesses predicted no impact, 31 per cent predicted a positive perception of the project. Very few businesses (two per cent) predicted a negative impact on demand for services upon operation
- Cammeray (53 per cent) and Victoria Road/Darling Street (50 per cent) were the most positive about the project enhancing demand for services.

Section 5.0 and section 6.0 identify and assess the business centres where construction and operational effects have the capacity to influence demand for goods and services.

5.0 CONSTRUCTION IMPACT ASSESSMENT

This section discusses the impacts that are likely to be experienced by businesses and business centres in the study area during project construction. These works have the potential to affect businesses, employees and customers positively or negatively. An assessment of the proposed project activities has been carried out to determine the type and magnitude of the impacts and to identify measures to avoid, minimise, manage and mitigate these.

This section assesses business centres that have a higher likelihood of experiencing direct and indirect construction phase impacts. Only themes that have been assessed to impact businesses have been included in the below assessment. If a theme is not listed, it is assumed to have a negligible impact. Details of construction elements can be found in Chapter 6 (Construction works) of the environmental impact statement. The section draws upon various environmental impact statement technical working papers to inform the extent of change from the existing environment, including:

- Technical working paper: Urban design, landscape character and visual impact assessment
- Technical working paper: Traffic and transport
- Technical working paper: Noise and Vibration
- Technical working paper: Air quality.

5.1 Centre-specific effects

The following sections present an impact assessment of business centres within the study area, as identified in section 3.1. This section omits business centres which are considered unlikely to experience any project effects. Businesses that adjoin centres, and which are not located in the business zone extent, have also been considered in this assessment as part of the broader centre.

5.1.1 South Harbour precinct

This section assesses business centres and businesses surrounding the centres within the South Harbour Precinct that have a higher likelihood of experiencing direct construction impacts.

5.1.1.1 Catherine Street centre

As described in section 3.1.1.1, the Catherine Street centre contains predominantly convenience uses that service the local catchment. Catherine Street centre is located around 850 metres from the temporary construction support site within Rozelle Rail Yards (WHT1), around 1,500 metres from the temporary construction support site Victoria Road (WHT2) and around 2,300 metres from the temporary construction support sites at White Bay (WHT3), which are subject to temporary impacts.

Construction outcomes

The main construction changes on businesses would be from increased construction vehicle movements and workers in the local area.

Construction benefits

Potential benefits from these changes include:

- Increase in passing trade and business visibility from additional construction vehicle movements along City West Link, specifically:
 - About 835 light vehicle movements per day and 860 heavy vehicle movements at peak levels from Rozelle Rail Yards WHT1 and White Bay WHT3 sites
 - Main haulage and access routes are via City West Link, however light vehicle movements would be more dispersed across the network.

This would predominantly benefit retail businesses that offer grocery or food and beverage sales.

- A marginal increase in demand for services due to its location on an access route for Rozelle Rail Yards WHT1 and White Bay WHT3.
- At the construction peak, around 2000 full time equivalent jobs would be created for the Western Harbour Tunnel project with a proportion of these workers located at Rozelle Rail Yards WHT1 and White Bay WHT3. These workers may visit businesses at Catherine Street. This would predominantly benefit retail businesses that offer grocery or food and beverage sales.

Localised negative impacts

There are no localised negative impacts anticipated during construction.

Effects on employee and customer access, servicing and deliveries, character and amenity and employee productivity and communication were not anticipated at this centre and are subsequently negligible.

Evaluation

Catherine Street Centre is a small centre serving a local catchment and some passing trade customers. Due to its location on a major arterial road that is proposed to be utilised for construction traffic and proximity to the construction sites, the centre may benefit from an increase in demand for services, business visibility and passing trade. Negative impacts are not anticipated during construction.

Conclusion

Overall, construction of the project would have short-term, localised positive effects over the duration of project construction.

5.1.1.2 Victoria Road/Darling Street centre

As described in section 3.1.1.2, the Victoria Road/Darling Street centre contains a variety of retail, medical, automotive and commercial uses servicing both a neighbourhood and wider catchment. Victoria Road/Darling Street centre is located adjoining the Victoria Road construction support site (WHT2). It is around 750 metres from the Rozelle Rail Yards construction support site (WHT1) and around 1,100 metres from the White Bay construction support site (WHT3).

Construction outcomes

The main construction effects on businesses would be from:

- Excavation and spoil haulage for the access decline and mainline tunnels
- Increased construction vehicle movements
- Noise effects from operation of the temporary construction support site
- Installation of an acoustic shed and temporary noise wall on all boundaries of the site to attenuate noise impacts.

Construction benefits

Potential benefits from these changes include:

- Increase in passing trade from additional construction vehicle movements and construction workers in the area. This may benefit retailers, personal service providers, cafés and restaurants
- Increased business centre visibility for businesses along Victoria and Darling Street, where close to Victoria Road, due to additional construction vehicles passing the business centre.

Specifically, up to 230 daily light vehicle movements and 420 daily heavy vehicle movements. This may be beneficial for retailers, personal service providers, cafés and restaurants

- Various retail convenience and food and beverage businesses are located in close proximity to the temporary construction support site. These businesses may experience an increase in demand for services due to increase construction workers. Specifically, at the construction peak, an additional 2000 full time equivalent jobs would be required to facilitate the Western Harbour Tunnel project component – a portion of these workers would be based at the Victoria Road construction support site (WHT2).

Localised negative impacts

Table 5-1 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-1: Victoria Road/Darling Street centre construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> Up to an additional 230 daily light vehicle movements and 420 daily heavy vehicle movements are expected. It may have minor effects on travel time for customers and employees, potentially deterring customers from visiting the area Victoria Road/Wellington Street intersection would be modified during construction to allow for vehicles exiting the temporary construction support site – this additional traffic would have minimal impact on businesses around Wellington Street as construction vehicles are required to give way to vehicles turning left from Wellington Street Access along Darling Street would remain unchanged with surface works on local roads not required Competition for parking may increase with additional construction workers in the area this may affect businesses that provide direct to public services The shared path on Victoria Road would be maintained. Construction vehicles would be required to give way to pedestrians. | Moderate | Moderate | Moderate |
| Servicing and delivery | <ul style="list-style-type: none"> Minor increase in construction traffic on main arterial roads Local road access would remain unchanged Changes to parking due to increased competition from construction workers; the cafés, restaurants and retail businesses in this area are dependent on deliveries and distribution and may be affected by this change. | Low | Moderate | Moderate-low |
| Character and amenity | <p>Located within an existing urban environment. Construction effects on amenity and character may be experienced. Specifically:</p> <ul style="list-style-type: none"> Airborne noise effects may be experienced by businesses fronting Darling Street between Victoria Road and Cambridge Street. Businesses immediately adjoining the temporary construction support site would be the most sensitive | Moderate | Moderate | Moderate |

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|---|---|-------------|------------|--------------|
| | <ul style="list-style-type: none"> Ground-borne noise effects may be temporarily experienced by businesses along Darling Street between Victoria Road and Merton Street during the tunnelling of the access decline Vibration effects may be temporarily experienced by businesses in proximity to the temporary construction support site during intensive vibration activities such as rock-hammering, specifically: <ul style="list-style-type: none"> businesses north and south of Darling Street between Victoria Road and Cambridge Street businesses fronting Victoria Road on the corners of Moodie Street and Wellington Street businesses on the western corner of Darling Street, north of Victoria Road Air quality – construction dust (generally standard mitigation measures are put in place to reduce construction dust). Although cleaning requirements can increase for most businesses, food production and serving businesses can be more affected by construction dust effects Visual – the visual character of the existing site is poor, consisting of dilapidated commercial premises. The temporary construction noise barrier would present a strong visual treatment to the street frontage, would screen all construction elements and would be unlikely to affect businesses. <p>Changes in amenity can affect the attractiveness and appeal of the centre to visitors and customers, resulting in patrons travelling to other centres, and businesses losing revenue. This would have an effect on cafés, restaurants and personal service businesses that are more dependent on pleasant urban environments such as a beauty salon. Short-term accommodation would particularly be affected.</p> | | | |
| Employee productivity and communication | As outlined above, some businesses may experience a reduction in employee productivity and communication capacity due to higher noise levels. The noise wall and acoustic shed are proposed to attenuate this impact, however some noise may still be experienced. This would have an effect on commercial office suites, cafés and restaurants. | Low | Moderate | Moderate-low |
| Business visibility | Construction hoardings would not impede views to businesses. | Moderate | Negligible | Negligible |

Evaluation

Businesses in the area have a higher sensitivity to changes in amenity, employee and customer access and business visibility. Businesses are generally not as sensitive to employee productivity and communication and servicing and delivery. Due to the proximity of the temporary construction support site to the centre, amenity impacts are most likely to generate some change to the existing

environment, with businesses potentially experiencing negative effects. Conversely, the site's proximity to the centre is likely to increase business visibility and demand for services with more construction workers in the area. The traffic environment would experience small changes with some negative effects anticipated. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on centre viability as the site is proposed to be reinstated upon operation (see Chapter 20 Land use).

Conclusion

The project would have short-term, localised impacts during construction that would affect businesses and the appeal of the centre overall. Some retail and service businesses may benefit from an increase in demand for services and passing trade.

Overall, construction would have a discernible negative impact on the centre but would be short term.

5.1.1.3 Robert Street industrial centre

As described in section 3.1.1.3, the Robert Street Industrial centre contains a variety of automotive, storage and trade-related businesses that service both a neighbourhood and wider catchment. The Robert Street Industrial centre is around 450 metres from the White Bay temporary construction support sites (WHT3), around 700 metres from the Victoria Road construction support site (WHT2) and around 800 metres from the Rozelle Rail Yards construction support site (WHT1).

Construction outcomes

The main construction effects on businesses would be from increased construction vehicle movements and workers on site.

Construction benefits

Due to these changes, the automotive and fitness businesses in the centre may benefit from a marginal increase in demand for services.

Localised negative impacts

Table 5-2 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment

Table 5-2: Robert Street Industrial centre construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|---|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> Construction traffic demand is forecast to marginally reduce the performance of major roads in proximity to the centre including: <ul style="list-style-type: none"> City West Link west of The Crescent in both directions (morning and evening peak) Victoria Road north of The Crescent in the northbound direction (evening peak) Victoria Road north of The Crescent in the southbound direction (morning peak). | Low | Low | Low |
| Servicing and delivery | <ul style="list-style-type: none"> Minor increase in construction traffic on main arterial roads Local road access would remain unchanged Changes to parking and loading zones are not anticipated The suppliers and contractor businesses in this area that are more dependent on deliveries and distribution may be affected by this change. | Low | Low | Low |

Evaluation

The majority of businesses within the centre are generally destination services that customers visit specifically. The centre is unlikely to benefit from passive trade, business visibility or increased demand for services. The construction of the project may influence the efficiency of the road network, consequently having minor negative effects on deliveries and access for employees and customers. Potential effects on character and amenity, passing trade, employee productivity and communication and business visibility were not anticipated at this centre. Any effects would be temporary and would generally respond to standard mitigation measures. While there may be temporary impacts on the efficiency of accessing businesses during construction, there is not expected to be a lasting impact on centre performance.

Conclusion

Construction of the project would generate discernible short-term, localised impacts on access and connectivity. Some retail and service businesses may benefit from an increase in demand for services and passing trade.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.1.1.4 James Craig Road working waterfront

As described in section 3.1.1.4, James Craig Road working waterfront contains a cluster of predominantly marine-related industries, including dry storage, slipways, harbour cruises, government agency (Roads and Maritime NSW), public marina berths as well as supportive food services such as cafés. James Craig Road would be used as an access road with businesses in this centre likely to be affected.

Construction outcomes

The James Craig Road working waterfront is located close to a number of construction support sites including:

- White Bay construction support site (WHT3) – around 250 metres away
- Rozelle Rail Yards construction support site (WHT1) – around 200 metres away
- Victoria Road construction support site (WHT2) – around 900 metres away.

James Craig Road working waterfront is also located adjacent to the proposed alterations works and surface road works that would be provided at the Rozelle Interchange.

Chapter 6 (Construction works) of the environmental impact statement provides further detail on construction works at each site and within the disturbance footprint. The main construction effects on businesses would be from:

- Increases in construction vehicle movements
- Changes in access arrangements for pedestrians, cyclists and motor vehicles
- Alterations to intersections and road network performance
- Noise effects from activities at the Rozelle Rail Yards temporary construction support site and the White Bay temporary construction support site
- Increase in maritime vessel movements within White Bay
- Construction fatigue from ongoing works in the area.

Construction benefits

Potential benefits from these changes include:

- Increased construction traffic and workers in the area would increase business visibility. This would be beneficial for customer-interfacing businesses such as boat hire or marina berth leasing

- Some maritime businesses may be required to support construction, such as boat hire to transfer workers.

Localised negative impacts

Table 5-3 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-3: James Craig Road working waterfront construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|---|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> Construction traffic demand is forecast to marginally reduce the performance of major roads in proximity to the centre including: <ul style="list-style-type: none"> James Craig Road south of The Crescent in the eastbound direction (morning peak) James Craig Road south of The Crescent in the eastbound direction (evening peak) Site access and egress would be via James Craig Road with an increase in the number of vehicles expected on this road from the existing traffic environment. Specifically: <ul style="list-style-type: none"> Up to an additional 530 daily light vehicle movements and 702 daily heavy vehicle movements would access the White Bay construction support site (WHT3) from James Craig Road Reduction in the performance of The Crescent/James Craig Road intersection. The intersection is already at capacity with or without construction Temporary closure of the shared path along The Crescent and White Bay Foreshore reducing pedestrian access. | Low | Moderate | Moderate-low |
| Servicing and delivery | Delays in travel time from increased construction vehicles, increased wait times due to construction works and construction-generated traffic congestion. | Low | Low | Low |
| Maritime operation | Some businesses within the cluster are reliant on efficient access to the water. Construction would increase the number of vessels using the waterway, potentially increasing on-water conflicts. | Moderate | Low | Moderate-low |
| Character and amenity | <p>Located within an urban environment. Construction effects on amenity and character are unlikely to be experienced. Specifically:</p> <ul style="list-style-type: none"> Noise effects, including airborne noise effects, may be experienced by businesses from construction works at Rozelle Rail Yards and White Bay temporary construction support sites. <p>Businesses in the area are unlikely to be dependent on pleasant amenity and character for operation.</p> | Negligible | Low | Negligible |

Evaluation

The majority of businesses within the centre are destination services that customers visit specifically. The centre is unlikely to benefit from passive trade, business visibility or increased demand for services. The construction of the project would negatively affect the efficiency and accessibility of the road network, consequently having an impact on deliveries and employee and customer access. The character and amenity of the area would change marginally due to construction works. Businesses in this location are less sensitive to amenity effects, access and connectivity. They would be able to

adapt easily to the change. While there may be temporary impacts on the efficiency of accessing businesses during construction, there is not expected to be a lasting impact on centre performance. Effects on character and amenity, passing trade and employee productivity and communication were not anticipated.

Conclusion

Construction of the project would have a noticeable, short-term, localised negative impact on access and connectivity both on and off water. Businesses would be able to adapt to the change. Some businesses may benefit from an increase in demand.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.1.1.5 Chapman Road working waterfront

As described in section 3.1.1.5, Chapman Road working waterfront contains a small cluster of predominantly marine-related industries, including boat hire, a multihull marina, charter boating and a slipway.

Construction outcomes

The Chapman Road working waterfront is located close to a number of temporary construction support sites including:

- White Bay temporary construction support site (WHT3) – around 800 metres away
- Rozelle Rail Yards temporary construction support site (WHT1) – around 200 metres away
- Victoria Road temporary construction support site (WHT2) – around 900 metres away.

The main construction effects on businesses would be from:

- Increases in construction vehicle movements
- Changes in access arrangements for pedestrians, cyclists and motor vehicles
- Alterations to intersections and road network performance
- Noise effects from activities at the Rozelle Rail Yards temporary construction support site and the White Bay temporary construction support
- Increase in maritime vessel movements within White Bay
- Construction fatigue from ongoing works in the area.

Construction benefits

No construction phase benefits are anticipated.

Localised negative impacts

Table 5-4 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-4: Chapman Road working waterfront construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> Construction traffic demand is forecast to marginally reduce the performance of major roads in proximity to the centre including: <ul style="list-style-type: none"> City West Link Road west of The Crescent would continue to perform poorly (both directions) in morning and evening peak, above capacity in both directions, in both the with/without construction scenarios The Crescent west of Victoria Road would continue to perform poorly (westbound), above capacity in both directions in both the with/without construction scenarios. There would be a slight reduction in performance in the eastbound direction The intersection of City West Link/The Crescent would continue to perform poorly, above capacity with or without construction in morning peak Competition for parking may increase with additional construction workers in the area. Parking in the area is already limited. Any further reduction in parking would potentially deter customers from travelling to the area. | Low | Moderate | Moderate-low |
| Maritime operation | Marine land-based operations, specifically at the western most extent of Rozelle Bay would experience alterations in access and adjustments to the Roads and Maritime lease agreement. Access to businesses in this location would however be maintained. | Low | Moderate | Moderate-low |
| Character and amenity | Introduction of construction activities to the environment. | Negligible | Low | Negligible |

Evaluation

The construction of the project would temporarily decrease the efficiency and accessibility of the road network, consequently having an impact on employee and customer access. Access arrangements would be altered for the centre however access to business would remain available. The character and amenity of the area would change due to construction works, however businesses in this location are less sensitive to amenity effects. Any effects would be temporary and would generally respond to standard mitigation measures. While businesses in the area would be sensitive to some changes, it is expected that they would retain a high ability to adapt to the change without business operations being affected. Effects on passing trade, employee productivity and communication, business visibility, demand for services and servicing and deliveries were not anticipated at this centre.

Conclusion

Construction of the project would have a noticeable, short-term, localised negative impact on access and connectivity both on and off water. Businesses would be able to adapt to the change.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.1.2 North Harbour Precinct

Temporary construction support sites would be required as part of the project. The North Harbour Precinct contains a number of construction support sites as follows:

Western Harbour Tunnel

- Sydney Harbour south cofferdam (WHT5)
- Sydney Harbour north cofferdam (WHT6)
- Berrys Bay (WHT7)
- Berry Street north (WHT8)
- Ridge Street north (WHT9)
- Cammeray Golf Course (WHT10)

Warringah Freeway Upgrade

- Blue Street (WFU1)
- High Street south (WFU2)
- High Street north (WFU3)
- Arthur Street east (WFU4)
- Berry Street east (WFU5)
- Ridge Street east (WFU6)
- Merlin Street (WFU7)
- Cammeray Golf Course (WFU8)
- Rosalind Street east (WFU9).

5.1.2.1 Kirribilli centre

As described in section 3.1.2.4, Kirribilli centre is a small neighbourhood centre containing a mix of convenience stores, food and beverage retailers, cafés and restaurants. The Kirribilli centre is close (<100 metres) to the Warringah Freeway construction disturbance footprint and is around 450 metres from the High Street south (WFU2) construction support site and 480 metres from the High Street north construction support site (WFU3), which are subject to temporary impacts.

Construction outcomes

The main construction effects on businesses would be from:

- Local surface road and bridge works along High Street and Alfred Street North
- Changes in access arrangements for pedestrians, cyclists and motor vehicles.

Construction benefits

Construction in the area may slightly increase demand for services and business visibility arising from changed traffic flows and more construction workers in centre. This would generally benefit food, beverage and convenience retailers.

Localised negative impacts

Table 5-5 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-5: Kirribilli centre construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|---|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> Temporary closure of the bridge (after 8.00pm), ramps and approaches to allow for surface works and duplication of High Street bridge and new High Street northbound entry ramp. This would affect access for customers and employees travelling from the southern approach over Sydney Harbour Bridge or from North Sydney. Alternative access is available via Alfred Street south Customers travelling on the Harbour Bridge southern approach to Kirribilli restaurants currently use Alfred St South; therefore, there is no change to access arrangements to businesses in Kirribilli. | Low | Low | Low |
| Servicing and delivery | <ul style="list-style-type: none"> Minor increase in construction traffic and alterations to road infrastructure impeding normal access routes (generally after hours) Centre can still be accessed from North Sydney by Alfred Street South These changes would primarily affect businesses that rely on early morning product delivery such as cafés, news agencies and convenience stores. | Low | Low | -Low |

Evaluation

Any effects would be experienced at an individual business level, with limited discernible changes to overall performance of the business centre. Changes to the road network would be noticeable and may affect the efficiency of access for employees, customers and for servicing and deliveries. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on the centre. Effects on character and amenity, passing trade and employee productivity and communication were not anticipated at this centre.

The area has strong local catchment, primarily serving residents, workers and the occasional visitor. Construction in the area may benefit food, beverage and convenience retailers.

Conclusion

Businesses have a strong local catchment, and while construction would alter access arrangement and potentially marginally increase demand for services, any positive or negative changes would be minor.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.1.2.2 Bay Road Waverton centre

As described in section 3.1.2.5, Bay Road Waverton centre is a small neighbourhood centre containing a mix of convenience stores, food and beverage retailers and cafés. The Bay Road Waverton centre is around 600 metres from the Berrys Bay construction support site (WHT7), which is subject to temporary impacts. The centre is located on the main access road for people entering and exiting the construction support site.

Construction outcomes

The main construction effects on businesses would be from:

- Increase in the number of construction vehicle movements using Balls Head Drive and Bay Road
- Increase in the number of construction workers in the area.

Construction benefits

The centre would likely benefit from construction works in the area. Benefits may include:

- Passing trade may increase as Balls Head Road is the main access road to Berrys Bay (WHT7) construction support site. Specifically, about 50 daily heavy vehicle movements and 200 daily light vehicle movements are forecasted. This may marginally benefit retailers offering convenience groceries or food and beverage products
- Increased business visibility with up to 50 daily heavy vehicle movements and 210 daily light vehicle movements are forecast. This may marginally benefit retailers offering convenience groceries or food and beverage products
- The centre is the closest retail location to the WHT7 construction support site and may experience an increase in demand for services from construction workers in the local area. This may marginally benefit retailers offering convenience groceries or food and beverage products.

Localised negative impacts

There are no localised negative impacts anticipated during construction.

Effects on character and amenity, employee productivity and communication, employee and customer access and servicing and deliveries were not anticipated at this centre and are subsequently negligible.

Evaluation

Bay Road Waverton is a small centre serving a local catchment and some passing trade customers. Due to its location on a construction access road, the centre may benefit from a minor increase in demand for services, business visibility and passing trade. Negative impacts are not anticipated during construction.

Conclusion

Overall, construction of the project would have short-term, localised positive effects over the duration of project construction.

5.1.2.3 North Sydney CBD

As described in section 3.1.2.3, North Sydney is part of the Harbour CBD metropolitan city centre within the Eastern Economic Corridor. The centre is oriented around commercial office uses with supporting residential, community facilities, retailers and food and beverage providers. The area is a large contributor to Greater Sydney's economic productivity servicing both a local and regional catchment.

The North Sydney CBD is located in close proximity to the construction disturbance footprint and a number of construction support sites including:

- Berry Street north (WHT8) – around 100 metres away
- Ridge Street north (WHT9) – around 500 metres away
- Blue Street (WFU1) – adjoining centre
- High Street south (WFU2) – around 350 metres away
- High Street north (WFU3) – around 300 metres away
- Arthur Street east (WFU4) – adjoining centre
- Berry Street east (WFU5) – adjoining centre
- Ridge Street east (WFU6) – around 450 metres away
- Road works along the Warringah Freeway and approach roads – less than 100 metres away at its closest point.

Construction outcomes

These sites are subject to temporary and permanent impacts. The main construction effects on businesses would be from:

- Local surface road works along Pacific Highway and Berry Street
- Changes in access arrangements for pedestrian, cyclist and motor vehicles
- Noise effects from bridge replacement and road widening works.

These effects would be more strongly felt by businesses adjoining construction support sites with the magnitude of impact dissipating the further the business is from the construction works.

Construction benefits

Due to construction, retail businesses and food and beverage services may experience a marginal increase in demand for services as a result of the increased construction workforce. At the construction peak, around 600 full time equivalent construction workers would be required directly on the Warringah Freeway Upgrade project. The centre may also benefit from secondary employment generation from support businesses. A number of businesses in the centre would offer services that could be utilised on the project including large construction firms, consultant firms etc.

Localised negative impacts

Table 5-6 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-6: North Sydney CBD construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|---|-------------|-----------|--------------|
| Employee and customer access | <p>Employee and customers travelling from east of the Warringah Freeway or using the Warringah Freeway would be affected by changes in the traffic environment during construction. This has the capacity to affect all businesses. Specific alterations include:</p> <ul style="list-style-type: none">• Temporary lane closures on Falcon Street, including bus lane merging with adjacent left-turning lane• Alfred Street exit ramp to North Sydney would be temporarily reduced to a single lane• Increased heavy and light vehicle construction movements along Blue Street, Berry Street, Falcon Street and Arthur Street• Higher volumes of traffic due to detours through North Sydney• Night time partial closure of the Warringah Freeway carriageway altering access between Miller Street and High Street – this has the capacity to affect late night business operations such as restaurants and 24-hour convenience stores• Temporary lane closures and new vehicular access at Berry Street – affecting employee and customer access for several businesses in North Sydney commercial core• Employees and customers reliant on pedestrian and cyclist access, particularly those travelling from the north or east of North Sydney, would be subject to alterations due to the replacement or widening of bridges | Moderate | Moderate | Moderate |

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------|--|-------------|-----------|--------------|
| | <ul style="list-style-type: none"> Changes to pedestrian and cyclist routes for extended periods of time with detours required. | | | |
| Passing trade | <ul style="list-style-type: none"> As highlighted above, temporary lane closures, detours, surface works and road alterations would affect passing trade in North Sydney. Some businesses would benefit as trade is directed towards their businesses while others may experience a reduction in trade. This would predominantly affect convenience, grocery, and food and beverage-related retailing including cafés and restaurants As a major commercial centre with a higher employee base, passing trade from pedestrian activity would be likely to remain relatively stable. | Low | Low | Low |
| Servicing and delivery | <ul style="list-style-type: none"> Detours through and around North Sydney would affect the efficiency of delivery services and potential accessibility of some businesses. This would particularly affect businesses that receive or distribute products or stock such as retailers, food and beverage outlets Delays in travel time from increased construction vehicles, increased wait times due to construction works and construction-generated traffic. This would particularly be experienced in areas adjoining the construction disturbance footprint. | Low | Moderate | Moderate-low |
| Character and amenity | <p>Businesses fronting the construction disturbance footprint along Berry Street and Pacific Highway may experience a reduction in the amenity and character of the environment. Specifically:</p> <ul style="list-style-type: none"> Airborne noise effects for businesses fronting Arthur Street, between the Pacific Highway and Ridge Street. Businesses along Mount Street, the Pacific Highway and Berry Street may also experience higher noise levels Businesses that are more reliant on pleasant noise environments such as serviced apartments, short-term accommodation, cafés and restaurants, beauty salons would be more affected by the change Ground-borne noise may be experienced by businesses near Church Lane, Kelrose Lane and Ridge Street during the tunnelling and rock-breaking process. These noise impacts are generally intermittent and short term and would likely not affect businesses Vibration – businesses unlikely to experience vibration effects as not within the human response or cosmetic damage buffers Air quality – construction dust (generally standard mitigation measures are put in place to reduce construction dust). Although cleaning requirements can increase for most businesses, food production and serving businesses can be more affected by construction dust effects | Low | Moderate | Moderate-low |

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|---|--|-------------|-----------|--------------|
| | <ul style="list-style-type: none"> Visual amenity would be altered from: <ul style="list-style-type: none"> Increase in temporary construction activities along the Warringah Freeway affecting businesses fronting Arthur Street and those with a view to Warringah Freeway Site hoarding, construction equipment, removal of vegetation and increased vehicular movements would increase visual impacts, particularly for businesses abutting the construction disturbance footprint, including along the Pacific Highway, Berry Street, Arthur Street and Ridge Street The landscape character of North Sydney CBD is unlikely to be adversely affected by the project. | | | |
| Employee productivity and communication | <ul style="list-style-type: none"> Airborne noise effects for businesses fronting Arthur Street, between the Pacific Highway and Ridge Street. Businesses along Mount Street, the Pacific Highway and Berry Street may also experience higher noise levels affecting employee productivity and communication. | Low | Moderate | Moderate-low |
| Business visibility | <ul style="list-style-type: none"> As highlighted above, detours, and road alterations would affect business visibility as traffic is redistributed to other thoroughfares Businesses along proposed access and egress routes may experience an increase in business visibility with additional construction vehicles passing the business. Increased daily vehicle movements are intended along: <ul style="list-style-type: none"> Berry Street, Warringah Freeway – 48 vehicles Ridge Street – 59 vehicles Blue Street – 240 vehicles Arthur Street – 128 vehicles Construction hoardings have the potential to impede business visibility if utilised for surface works along Pacific Highway and Berry Street Retailers and the personal service industry would be most sensitive to changes in business visibility. | Low | Low | Low |

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|---------------------|--|-------------|-----------|--------------|
| Demand for services | <ul style="list-style-type: none"> The centre may experience a marginal increase in demand for services due to the increased construction workforce. Particularly retail businesses and food and beverage services At the construction peak, around 600 construction workers would be required directly on the Warringah Freeway Upgrade project Secondary employment generation from support businesses A number of businesses in the centre would offer services that could be utilised on the project including large construction firms and consultant firms | Low | Low | Low |

Evaluation

While there are likely to be temporary impacts on businesses during construction, there is not expected to be a lasting impact on centre viability. The project construction phase would temporarily reduce the efficiency of movement within the centre as well as accessibility of the centre, affecting employee and customer access and servicing and delivery. Passing trade and business visibility would be altered for businesses due to detours and increased construction vehicle movements. Some businesses may benefit from an increase in passing trade or demand for services. While businesses would be sensitive to changes, generally they would retain a high ability to adapt to the alterations and would be able to continue operating.

Conclusion

The project would have short-term, localised impacts during construction that would affect businesses either positively or negatively. Construction of the project would create a clearly noticeable alteration to the centre environment.

Overall, construction would have a discernible, negative impact on the centre, but this impact would be short term.

5.1.2.4 Neutral Bay Junction

As described in 3.1.2.8, Neutral Bay Junction is a mixed-use centre comprising a variety of residential, retailing and commercial office premises. The Neutral Bay Junction is:

- In close proximity (<100 metres) to surface works proposed for Military Road/Falcon Street intersection
- In close proximity (<100 metres) to surface works proposed for Ernest Street
- Around 400 metres to the Cammeray Golf Course construction support sites (WFU8/WHT10), which is subject to permanent and temporary impacts.

Construction outcomes

The main construction effects on businesses would be from:

- Upgrading local and arterial road networks connecting to the Warringah Freeway Upgrade – including Falcon Street and Ernest Street
- Bridge works including modification to the Ernest Street bridge and the Falcon Street bridge
- Changes in access arrangements for pedestrians, cyclists and motor vehicles
- Changed access arrangements (signalised intersection) on Ernest Street to facilitate construction support site entry and egress.

These effects are predominantly indirect, associated with traffic and transport efficiency.

Construction benefits

Businesses may benefit from a slight increase in demand for groceries, food and beverage products from additional construction workers and construction vehicle movements in the local area.

Localised negative impacts

Table 5-7 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-7: Neutral Bay Junction centre construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|---|-------------|-----------|--------------|
| Employee and customer access | <p>Employees and customers travelling from the Lower North Shore and Northern Beaches or west-east through the Ernest Street or Falcon Street intersections may experience an increase in congestion. This would be due to:</p> <ul style="list-style-type: none"> • Addition of construction traffic reducing the performance of Falcon Street east of Miller Street in morning and evening peaks • Additional construction traffic from WHT10 and WFU8 reducing road efficiency – specifically: <ul style="list-style-type: none"> – 1180 light and 490 heavy vehicle movements per day at peak • Bridge and surface works causing additional traffic delays and congestion along Military Road. | Low | Moderate | Moderate-low |
| Passing trade | As highlighted above, temporary lane closures, detours, surface works and road alterations would affect passing trade as people avoid the centre to go to more easily accessible locations. This would have a consequence on retailers, personal service providers, cafés and restaurants. | Moderate | Moderate | Moderate |
| Servicing and delivery | <ul style="list-style-type: none"> • Detours and congestion due to works listed above, affecting efficiency of delivery services and potential accessibility of some businesses • Night time full closure of Warringah Freeway – affecting servicing and deliveries outside operating hours • Delays in travel time from increased construction vehicles, increased wait times due to construction works and construction-generated traffic congestion • As there are a number of restaurants and grocery stores in this location, the night time works may affect the efficiency of servicing and delivery. | Moderate | Low | Moderate-Low |

Evaluation

Neutral Bay is located at the start of the Neutral Bay–Mosman peninsula and generally benefits from passing trade as people travel to and from work. Most businesses would be able to adapt to changes in the environment. The centre has a strong local catchment serviced by both workers and residents in the local area and those from further north travelling along Military Road to access other employment centres. Changes in access and connectivity may deter customers from travelling to the centre or stopping due to higher amounts of congestion. Businesses are unlikely to experience changes to business visibility and amenity. The construction work would result in more congestion in the area and reduced accessibility. Effects on character and amenity, employee productivity and communication and business visibility were not anticipated at this centre.

While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on the performance of the centre.

Conclusion

Businesses have a strong local catchment, and while construction would alter access arrangement and potentially marginally increase demand for services, any positive or negative changes would be minor.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.1.2.5 Military Road Cremorne centre

As described in section 3.1.2.7, the Military Road Cremorne centre contains a diverse mix of uses including residential, entertainment, food and beverage retailers and commercial businesses. The Military Road Cremorne centre is located around 1,300 metres from the Cammeray Golf Course construction support sites (WHT10 and WFU8), which is subject to temporary and permanent impacts, and 1,200 metres from surface works on Falcon Street and Ernest Street.

Construction outcomes

The main construction effects on businesses would be from:

- Upgrading local and arterial road networks connecting to the Warringah Freeway Upgrade – including Falcon Street and Ernest Street
- Bridge works including modifications to the Ernest Street bridge and the Falcon Street bridge
- Changed access arrangements (signalised intersection) on Ernest Street to facilitate construction support site access.

These construction impacts are predominantly indirect, associated with traffic and transport efficiency.

Construction benefits

No construction phase benefits are identified.

Localised negative impacts

Table 5-8 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-8: Military Road Cremorne centre construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|-------------|-----------|--------------|
| Employee and customer access | <p>Employee and customers travelling west–east through the Ernest Street or Falcon Street intersections to access the business centre may experience an increase in congestion. Specifically, due to:</p> <ul style="list-style-type: none"> • Bridge and surface works causing additional traffic delays and congestion along Military Road • Additional construction vehicle movements. | Low | Low | Low |
| Servicing and delivery | <ul style="list-style-type: none"> • Night time full closure of Warringah Freeway – affecting servicing and deliveries outside operating hours • Delays in travel time from increased wait times due to construction works and construction-generated traffic congestion • As there are a number of restaurants and grocery stores in this location, the night time works and alterations to access arrangements may affect the efficiency of servicing and delivery. | Low | Low | Low |

Evaluation

Changes to the road network may affect the efficiency of servicing and deliveries. Businesses are unlikely to experience changes to business visibility, amenity and passing trade. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on the performance of the centre. Effects on character and amenity, passing trade, employee productivity and communication, business visibility, demand for services were not anticipated.

Due to the distance of the centre from proposed construction works, businesses are unlikely to be sensitive to changes.

Conclusion

Businesses have a strong local catchment, and while construction would alter access arrangement, any changes would be minor.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.1.2.6 Miller Street Cammeray centre

As described in section 3.1.2.2, the Miller Street Cammeray centre contains a diverse mix of uses including a Stockland shopping centre, food and beverage retailers, commercial businesses and neighbourhood shops.

The Miller Street Cammeray centre is located around 300 metres from the Cammeray Golf Course construction support sites (WHT10 and WFU8), which are subject to temporary and permanent impacts. Refer to Chapter 6 of the environmental impact statement for detail on construction works at each site and within the construction disturbance footprint.

Construction outcomes

The main construction effects on businesses would be from:

- Local surface road works along Miller Street
- Changes in access arrangements for pedestrians, cyclists and motor vehicles
- Increase in construction workers in the locality (Rosalind Street WFU9).

Construction benefits

The centre is the closest retail location to the WFU9 and WHT10/WFU8 construction support sites and may experience an increase in demand for services and business visibility from construction workers in the local area. This would predominantly benefit convenience and food and beverage retailing businesses.

Localised negative impacts

Table 5-9 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-9: Miller Street Cammeray centre construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none">Local surface works or alterations on Miller Street near Amherst Street may generate slight delaysMarginal increase in construction traffic from vehicles using Miller Street/Warringah Freeway as WHT10/WFU8 site entryNo local road, pedestrian or parking changes are expected. | Low | Low | Low |

Evaluation

Any positive or negative effects would be experienced at an individual business level, with no discernible changes to overall performance of the business centre. While there may be a discernible change in employee and customer access, effects on character and amenity, passing trade, employee productivity and communication and servicing and deliveries were not anticipated.

Businesses are generally reliant on the local resident and worker catchment that would still be able to access shops and services. It is expected that the centre would be able to adapt to changes.

Conclusion

Businesses have a strong local catchment, and while construction would alter access arrangement, any changes would be minor.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.1.2.7 St Leonards–Crows Nest centre

As described in section 3.1.2.6, St Leonards–Crows Nest is a larger centre within Greater Sydney's Eastern Economic Corridor. The centre contains a mix of uses including commercial offices, residential, community facilities, retailers and food and beverage providers. The area primarily services a local catchment with some larger businesses servicing the regional catchment. St Leonards–Crows Nest may experience indirect temporary impacts as a result of traffic changes and construction disturbance along Falcon Street and Ernest Street. The centre is around 900 metres from the Rosalind Street East construction support site (WHU9).

Construction outcomes

The main construction effects on businesses would be from:

- Upgrading local and arterial road networks connecting to the Warringah Freeway Upgrade – including Falcon Street and Ernest Street
- Bridge works including reconfiguration of Ernest Street bridge and the Falcon Street bridge
- Changes in access arrangements for pedestrian, cyclist and motor vehicles.

These effects are predominantly indirect, associated with traffic and transport efficiency.

Construction benefits

There are no benefits identified during construction.

Localised negative impacts

Table 5-10 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-10: St Leonards–Crows Nest centre construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|-------------|-----------|--------------|
| Employee and customer access | <p>Employee and customers required to travel through the Ernest Street or Falcon Street intersections may experience an increase in congestion and travel delays. This is due to:</p> <ul style="list-style-type: none"> Additional construction traffic reducing the performance of Falcon Street east of Miller Street (westbound) in morning and evening peaks Additional construction traffic from WHT10 and WFU8 reducing road efficiency – specifically 1180 light and 490 heavy vehicles per day Bridge and surface works causing additional traffic delays. | Low | Low | Low |
| Servicing and delivery | <ul style="list-style-type: none"> Night time full closure of Warringah Freeway carriageway – affecting servicing and deliveries outside operating hours. As there are a number of restaurants and grocery stores in this location, the night time works may affect the efficiency of servicing and delivery Delays in travel time from increased construction vehicles, increased wait times due to construction works and construction-generated traffic congestion. | Low | Low | Low |

Evaluation

Changes to the road network may affect the efficiency of access for employees, customers and for servicing and deliveries. While there may be temporary impacts on some businesses during construction, there is not expected to be a lasting impact on the performance of the centre. Effects on character and amenity, passing trade, employee productivity and communication, business visibility and demand for services were not anticipated at this centre. Businesses in this area have a strong trade catchment and are slightly separated from construction works. Generally, they would retain a high ability to adapt to any changes.

Conclusion

Construction of the project would have some short-term, localised negative impact on access and connectivity. Businesses would be able to adapt to the change.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.1.2.8 Artarmon industrial

As described in Section 3.1.2.9, Artarmon industrial precinct is oriented around automotive, bulky goods, warehousing, film related industries and specialty manufacturing. The centre is a major distributor of goods and services and would be heavily dependent on access.

Construction outcomes

Artarmon industrial precinct is located next to Waltham Street (WHT11) construction support site and the proposed communication connection cable linking the Western Harbour Tunnel with the motorway control centre.

Several project elements are located next to the precinct requiring the demolition of existing buildings, trenching along the Gore Hill Freeway and Warringah Freeway road reserves and Warringah Freeway Upgrade road works. The main construction effects on businesses would be from:

- Construction of a motorway control centre next to Waltham Street, Artarmon
- Waltham Street (WHT11) construction support site would be used for equipment laydown
- Additional car parking would be provided on site for construction workers
- Construction activities have the potential to impacting business amenity.

Construction benefits

The centre is the closest commercial area to construction support sites WHT11 and may benefit from an increase in demand for services from construction workers in the local area. It may also benefit from a potential increase in passing trade from additional construction vehicles – about 182 light vehicles and 66 heavy vehicle movements per day on Waltham Street, Artarmon.

Localised negative impacts

Table 5-11 assesses local negative impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-11: Artarmon industrial construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|---|--|-------------|-----------|--------------|
| Character and amenity | <ul style="list-style-type: none"> Industrial land use generally has a lower dependency on character and amenity than commercial or mixed use. Construction effects on amenity and character may be experienced due to: <ul style="list-style-type: none"> Visual presence of construction, including construction workers, site hoardings, construction vehicles and construction equipment Site hoardings, construction equipment and increased vehicle movements would likely be visible Portals to be integrated into the road corridor through material selection and landscape planting Impacts relating to construction of motorway control centre to be minimised by ensuring the design is recessive and integrated with the surrounding buildings and industrial context Loss of vegetation during construction Increased noise during construction, specifically along Punch Street, Cleg Street and Waltham Street. Businesses immediately adjoining the construction support sites WHT11 would be the most sensitive. | Low | Low | Low |
| Employee productivity and communication | <ul style="list-style-type: none"> Businesses along Waltham Street may experience higher noise levels particularly during utility and building structural work affecting employee productivity and communication. | Low | Low | Low |

Evaluation

Construction of the project would generate a minor discernible change to the amenity of Artarmon industrial precinct. Effects on employee and customer access, passing trade, servicing and delivery and business visibility were not anticipated at this centre. As an industrial location, businesses in the area generally have low sensitivities to changes in amenity and can easily adapt to change. While they are more sensitive to access and connectivity changes, no discernible impacts are identified. Some businesses may benefit from an increase in demand for services.

Conclusion

Construction of the project would have some short-term, localised effects; however, any positive or negative changes would be minor.

Overall, construction is not anticipated to effect ongoing centre or business performance.

5.2 Property impacts

The nature of direct property impacts, including details of property acquisitions, temporary occupation of land and settlement and subsidence impacts are detailed in Chapter 18 (Land Use and Property) of the environmental impact statement. This section identifies the consequence of these direct property acquisitions on businesses.

Businesses have specific and individual needs, including but not limited to the location of the business premises, access to the business by employees and customers and the ability to deliver and receive goods and services. The acquisition of properties, including cessation of leases and subsequent relocation or closure of businesses has the potential to result in:

- Disruptions to business operation
- Loss of revenue
- Relocation and re-establishment costs
- Employee training expenses for new employees
- Trade catchment alterations
- Business closure.

The project has been designed to minimise the need for surface property acquisition and occupation, where feasible and reasonable. However, given the limited availability of land in the area identified for the project and the desire to minimise acquisition of private property, some commercial properties would be required to facilitate construction of the project, resulting in the temporary occupation or permanent acquisition of private land.

The following table provides a more detailed overview of acquisitions as they relate to business uses. Refer to Chapter 20 of the environmental impact statement for a full list of acquisitions, including residential and recreation space that is not the subject of this report.

Table 5-12: Commercial and industrial acquisition requirement for the project

| Location | Lot/DP | Zone | Permanent or temporary | Acquired /Leased | Partial/Full |
|-----------------------------|---------------|-------------------------------|------------------------|------------------|--------------|
| Waltham St, Artarmon 2064 | B/DP334161 | IN2 – Light Industrial | Permanent | Acquired | Full |
| Falcon Street, North Sydney | 2/DP220909 | R4 – High Density Residential | Permanent | Acquired | Partial |
| Falcon Street, North Sydney | 1/DP220909 | R4 – High Density Residential | Permanent | Acquired | Partial |
| Balls Head Road, Waverton | 21/DP1048933 | IN4 – Working Waterfront | Temporary | Leased | Full |
| Glebe Island, Rozelle | 2/DP879549 | SREP | Temporary | Leased | Partial |
| Glebe Island, Rozelle | 10/DP1170710 | SREP | Temporary | Leased | Partial |
| Glebe Island, Rozelle | 4/DP875201 | SREP | Temporary | Leased | Partial |
| Balls Head Road, Waverton | 102/DP1162896 | IN4 – Working Waterfront | Temporary | Leased | Full |

| Location | Lot/DP | Zone | Permanent or temporary | Acquired /Leased | Partial/Full |
|--------------------|----------------|-------------------------|------------------------|------------------|--------------|
| Park Ave, Cammeray | 2/DP244543 | RE1 – Public Recreation | Both | Both | Partial |
| Park Ave, Cammeray | 3/DP244543 | RE1 – Public Recreation | Permanent | Acquired | Full |
| Park Ave, Cammeray | 4/DP244543 | RE1 – Public Recreation | Permanent | Acquired | Full |
| Park Ave, Cammeray | 5/DP244543 | RE1 – Public Recreation | Permanent | Acquired | Full |
| Park Ave, Cammeray | 6/DP244543 | RE1 – Public Recreation | Permanent | Acquired | Full |
| Park Ave, Cammeray | 7302/DP1136001 | RE1 – Public Recreation | Both | Both | Partial |
| Park Ave, Cammeray | 7303/DP1136001 | RE1 – Public Recreation | Both | Both | Partial |

The sites at Waverton, although zoned for industrial working waterfront use, do not currently contain an operating business. The location does contain a number of buildings that have previously been used to support marine-related services. As no businesses are operating, the impact of the project would be limited.

The Cammeray Golf Course supports a number of uses including the operation of the nine-hole golf course, the pro-shop, a function centre and golf tuition, clinics and lessons. The impact upon Cammeray Golf Club would result from the establishment of infrastructure required to service both the Beaches Link project and the proposed Western Harbour Tunnel project. The permanently impacted section of Cammeray Golf Course is located towards to the west and south-west, adjoining the Warringah Freeway corridor and Ernest Street. Land to be acquired for construction is also required for operation meaning that the reduction of the golf course size will be permanent. The project would allow for a reconfigured, nine-hole golf course to be maintained throughout construction and operation of the project (albeit with a shorter fairway). The operation of the Cammeray Golf Course pro-shop and function centre would not be impacted.

Any future development (including non-residential development) at heights of 20 metres or higher near ventilation outlets would require planning controls to ensure they are not adversely impacted by the ventilation outlets. The development of planning controls would be supported by detailed air quality modelling. Further details are provided in Technical working paper: Air quality.

Table 5-13 assesses property impacts that may arise from project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-13: Property acquisition issues appraisal

| Sensitivity | Magnitude | Significance |
|---|--|---|
| A small number of businesses would be required to slightly alter operations. The Cammeray Golf Course, however, will be permanently reduced to operating as a nine-hole course. The remainder of locations were vacant or already owned and operated by Roads and Maritime. | A clear noticeable difference from baseline condition due to the direct impact on a small number of receptors. | The effects of acquisition would be experienced by individual businesses and the broader community that utilise the businesses. |
| Moderate | Moderate | Moderate |

Evaluation

Overall, only three lot parcels associated with business land uses are required to alter operations to facilitate the project. These parcels are located at Waltham Street, Artarmon and Balls Head Road, Waverton. Glebe Island, Rozelle is also utilised for industrial/port related uses, permissible under the SREP. The impact upon these businesses would be somewhat mitigated by the implementation of the acquisition and compensation process in line with the *Determination of compensation following the acquisition of a business guideline* (NSW Government, date unknown). This guideline provides direction to all NSW acquiring authorities in determining compensation for a business conducted on land that is acquired in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW). It is acknowledged in the guide that each case for business interest compensation should be considered on its individual merits. The business interest may be in the same ownership as the 'land' or may be a non-related party.

Conclusion

Construction of the project would have longer term negative impacts on a discrete number of businesses. Negative impacts would be limited to the individual businesses and would unlikely affect the broader business environment or industries.

5.3 Broader construction impacts

5.3.1 Maritime construction impacts

As identified in Technical working paper: Traffic and transport, impacts on maritime services are anticipated during the construction of the project due to the following:

- Alterations in access to Birchgrove Ferry Wharf
- Up to seven partial closures of Sydney Harbour between Birchgrove and Berrys Bay for a period of up to 48 hours
- Relocation of swing moorings
- Provision of temporary moorings at Snails Bay
- Establishment and operation of the Berrys Bay construction support site
- Installation of cofferdams at Birchgrove and Berrys Bay
- Dredging activities
- Barge movements for delivering material, removing tunnel spoil and dredge material, or for other construction activities
- Tugboat movements for manoeuvring barges
- Transport vessels for workers.

As identified in section 3.3, Sydney Harbour is a major economic generator for the city with a number of businesses reliant on the use of the waterway. Where possible, impacts on waterway users have been minimised, however construction would still require harbour closures and route alterations that would affect businesses.

Table 5-14 assesses negative maritime impacts that may arise during project construction that have the capacity to influence maritime business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-14: Maritime construction issues appraisal

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> Alterations in access to Birchgrove Ferry Wharf and partial closure of the harbour between Birchgrove and Berrys Bay would impact harbour city ferry services, specifically the F3 Parramatta River Line and the F8 Cockatoo Island Line, as well as the Lane Cove to City Captain Cook Cruises Line Altered ferry and cruise boat routes and an increase in travel time due to speed restrictions As the Harbour CBD is a major employment location, reducing the accessibility and efficiency of trips to this location can affect a large number of receivers Customers may also be less inclined to travel to the city with a potential loss of expenditure for business in this location. This expenditure would likely shift to another business centre which would benefit from the alterations. Customer interfacing businesses such as retailers, food and beverage services and personal services would be the most affected by this alteration. Temporary relocation of moorings at Snails Bay. | Moderate | Moderate | Moderate |
| Restricted access capacity | <ul style="list-style-type: none"> The scheduled seven partial closures of the harbour would prevent larger vessels, including oil tankers, crossing the harbour between Birchgrove and Berrys Bay. Considering the Shell Oil terminal is positioned on the Greenwich peninsula, to the north of the project area, this restricted harbour access (for up to 48 hours in any one period) would result in scheduling inefficiencies and potential lost revenue for the company Cruise ships would not be affected by these closures as the terminals are positioned south of the restriction zone White Bay berths 2, 4 and 5 (Cruise Terminal), Baileys Marine Fuels and Glebe Island berths 1, 2, 7 and 8 would not be impacted by the construction activities. White Bay berth 3 is proposed to be used for handling dredged material for the project. | Low | Moderate | Moderate-low |
| Delayed operations | <ul style="list-style-type: none"> The harbour closures would require restricted access for periods of up to 48 hours and altered routes. Small vessels, including ferries, would be required to be escorted through the restricted area with speed restrictions imposed. This has the capacity to affect tourism businesses such as harbour cruises or Cockatoo Island visitors as the appeal of the experience is reduced due to time delays and reduced amenity Additional boat movements to support the removal and disposal of suitable spoil offshore are unlikely to affect cruise liners as construction vessels are required to give way Customers for water taxis and boat hire may also reduce as the efficiency of the trips or appeal of accessing certain areas is altered. Ferry operators may also experience a decline in patrons due to the delayed journey The increased construction traffic on the harbour may also generate delays in vessel movements, particularly for larger vessels such as cruise ships. | Moderate | Moderate | Moderate |

| Issue | Construction effects | Sensitivity | Magnitude | Significance |
|-----------------------|---|-------------|-----------|--------------|
| | This may be particularly experienced around White Bay where the cruise terminal and temporary construction support site are on the same peninsula. | | | |
| Character and amenity | <ul style="list-style-type: none"> The character and amenity of the harbour would be altered with increased barge and boat movements and the construction activities on the water. This has the capacity to affect businesses, particularly tourism businesses that attract clients due to the experience and appeal of the harbour Prolonged periods of high marine construction activity would occur over a 12-month period, generating daily vessel movements consisting of the following: <ul style="list-style-type: none"> 50 barge movements 32 small boat movements for transporting employees Tug boat movements Two stationary barges at cofferdams that may move periodically One dredger One immersed tube tunnel segment The increased vessel numbers and presence of marine construction activities may deter customers from hiring or chartering boats or recreational marine crafts, particularly from businesses around the construction area. | Moderate | Moderate | Moderate |

Evaluation

While there may be temporary impacts during construction, there is not expected to be a lasting impact on businesses. Any effects would be experienced at an individual business level, with no discernible changes to overall performance of the broader maritime industry.

Conclusion

Overall, construction of the project would have short term negative effects at an individual business level, with no discernible changes to the broader maritime business environment.

5.3.2 Freight and efficiency costs

The freight and logistics industry is an important part of the NSW economy as an enabler of economic activity. The *NSW draft Freight and Ports Plan (2017)* estimates that freight and logistics contributed \$66 billion per annum to NSW State Gross Product (SGP), with the estimated value of products moved by freight in NSW over \$200 billion per annum². The Plan estimates that freight volumes will double in the Greater Sydney area in the next 40 years, driven by population growth, increased consumer expectations, online technologies and the decline in manufacturing³. Businesses are becoming increasingly dependent on product and service distribution, with the efficiency and reliability of the transport network fundamental to the economic prosperity of businesses and cost savings for the end customer.

² Transport for NSW, 2017, NSW Draft Freight and Ports Plan, NSW Government

³ *ibid.*

Delays in vehicle movements directly affect businesses expenditure and productivity. The Bureau of Transport, Infrastructure and Regional Economics (BITRE) says congestion is costing Sydney around \$6.1 billion per year, with these costs forecast to double by 2030⁴.

As identified in section 3.4.1, there are a number of major arterial roads and motorways in the study area, which carry higher volumes of freight and commercial vehicles. Although temporary, the construction of the project has the capacity to affect the efficiency of these roads due to alterations, detours and the addition of construction traffic.

Technical working paper: Traffic and transport identifies that the addition of construction traffic on the road network would have minimal effect on existing performance. Network inefficiencies however would arise with temporary closure of the Warringah Freeway and alterations in the network due to the removal and widening of bridges, lane configuration alterations and on and off ramp alterations.

The closure of the Warringah Freeway during various night time periods (10.00pm to 5.00am), with access restricted between Miller Street and High Street, would cause delays and disruptions for road users, including freight. Detours would result in substantially increased traffic on other arterial roads and local roads during the closure periods. Roads that would experience high detoured volumes would be around North Sydney, Neutral Bay, Rozelle and the Sydney CBD, with the most impacts likely to be on the Pacific Highway.

Table 5-15 assesses property impacts that may arise during project construction that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 5-15: Freight and efficiency construction issues appraisal

| Sensitivity | Magnitude | Significance |
|--|--|--|
| The businesses reliant on the freight network have a number of vulnerabilities yet retain the ability to absorb or adapt to change and are therefore their sensitivity is considered moderate. | The project would create a clearly noticeable difference to the transport network, however only temporary with businesses likely to experience negative effects. | Overall the level of significance would be moderate. |
| Moderate | Moderate | Moderate |

Evaluation

Changes during construction would influence travel time and efficiency of freight trips, potentially resulting in additional costs to businesses and reduced productivity. These changes can also influence product distribution and delivery with servicing to businesses generally happening outside business hours. It is anticipated that further management measures would be required to address these impacts and maximise the efficiency of transport routes during construction. While delays and detours would be a short term inconvenience during construction, it is not anticipated to have ongoing effects on the performance of the business environment. Most businesses would adapt to the change.

Conclusion

Overall, construction of the project would have short term negative effects on the broader business environment.

Bureau of Transport, Infrastructure and Regional Economics, 2015 p.1

6.0 OPERATIONAL IMPACT ASSESSMENT

This section provides an assessment of the potential impacts on businesses that are likely to occur due to the operation of the project. Key features of the project are identified in section 1.4 of this report and a detailed description of the project is provided in Chapter 5 (Project description) of the environmental impact statement.

These works have the potential to affect businesses, employees and customers positively or negatively. This section assesses business centres that have a higher likelihood of experiencing direct and indirect impacts associated with the operation of the project and broader impacts across the network. The section draws upon various environmental impact statement technical working papers to inform the extent of change from the existing environment. These include:

- Technical working paper: Urban design, landscape character and visual impact assessment
- Technical working paper: Traffic and transport
- Technical working paper: Noise and Vibration
- Technical working paper: Air quality.

6.1 Centre-specific effects

The following section provides an impact assessment of operational effects on business centres within the study area, as identified in section 3.1. This section has omitted business centres which are considered unlikely to experience any project effects. Businesses that adjoin centres, and are not located in the business zone extent, have also been considered in this assessment as part of the broader centre.

6.1.1 South Harbour Precinct

This section assesses business centres, and businesses surrounding the centres within the South Harbour Precinct, that have a higher likelihood of experiencing operational impact.

6.1.1.1 Victoria Road/Darling Street centre

As described in section 3.1.1.2, the Victoria Road/Darling Street centre contains a variety of retail, medical, automotive and commercial uses servicing both a neighbourhood and wider catchment.

Project outcomes

The project would comprise twin main alignment tunnels connecting Rozelle, at the M4-M5 Link interchange near City West Link, to the Warringah Freeway at North Sydney. Each tunnel would accommodate three lanes of traffic. Although a temporary construction support site is located in proximity to Victoria Road/Darling Street centre during construction, this site would not be required upon operation, with no tunnel portals or surface infrastructure located in close proximity to the centre.

Chapter 5 (project description) of the environmental impact statement provides a project description identifying operational outcomes. The main operational effects on businesses would be from:

- Surplus land – construction support site at Rozelle would be resurfaced and left in a condition that enables redevelopment in line with planning conditions by another party
- Alterations in the intersection and road network performance across the Rozelle area
- Travel time alterations for both road and public transport network
- Improved connectivity between the north precinct and the south precinct.

Operational benefits

Benefits of operating the project include:

- Average travel speeds through the area are predicted to substantially increase with more free-flowing traffic. This would improve the travel times for employees and customers accessing the centre
- The direct connection obtained with Western Harbour Tunnel substantially improves accessibility of the centre, potentially increasing the trade catchment of some businesses and enhancing employee accessibility and appeal. As most of the businesses in the locality service the neighbourhood catchment, the extent of benefit may be more limited. Some cafés and speciality retailers along Darling Street may experience an increase in trade due to improved customer connectivity
- Traffic demand through the Rozelle study area is forecast to increase by up to 14 per cent as a result of the project. This may result in an increase in passing trade as more vehicles travel through the area
- Bus travel times in the southbound direction during morning peak would improve marginally
- An increase in average travel speeds in the area and improved connectivity to the broader network would enhance service and delivery capacity
- The construction support site at Victoria Road, Balmain would not be required upon operation. The site would be resurfaced and left in a condition that enables redevelopment by others. This would have limited visual impact on the surrounding centre.

Localised negative impacts

Despite the benefits outlined above, some localised impacts may arise from project operation. Table 6-1 assesses the significance of these localised negative impacts. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 6-1: Victoria Road/Darling Street centre operational issues appraisal

| Effect | Operational effects | Sensitivity | Magnitude | Significance |
|------------------------------|---|-------------|------------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> • The intersection of Victoria Road and Darling Street would continue to operate at capacity during peak periods. This intersection is already operating at capacity and would be unlikely to deter customers travelling to the area • Northbound bus travel times along Victoria Road would increase during the busiest peak periods as a result of increased local traffic volumes heading north and merging with M4-M5 Link traffic. These changes may affect employees travelling to work from the south who are dependent on public transport. Customers are primarily from the local catchment and would be unlikely to be affected by morning peak traffic. | Negligible | Low | Negligible |
| Servicing and delivery | <ul style="list-style-type: none"> • A reduction in peak period intersection performance on Victoria Road and Darling Street would create localised servicing and delivery delays, however this intersection is already operating at capacity and the impacts are unlikely to be noticeable • The majority of business in the locality centre would not be heavily dependent on distribution with the added benefit of increased connectivity likely minimal. | Low | Negligible | Negligible |

Evaluation

The Rozelle area is anticipated to experience an increase in traffic demand and accessibility with the establishment of the Western Harbour Tunnel. Although the Victoria Road/Darling Street business centre does not directly adjoin the interchange, it is positioned on a main feeder road with the capacity to benefit from increased vehicle movements past the centre. The additional connection across the harbour to Rozelle also has the capacity to increase the trade area of some businesses, with the area now more accessible to a broader customer catchment. Any localised negative changes in access and connectivity would unlikely be discernible or businesses would be able to adapt to the change. Effects on employee productivity and communication, business visibility and demand for services are not anticipated at this centre.

Conclusion

Overall, the project would have long term positive effects on the business environment.

6.1.1.2 Robert Street industrial centre

As described in section 3.1.1.3, the Robert Street Industrial centre contains a variety of automotive, storage and trade-related businesses that service both a neighbourhood and wider catchment.

Project outcomes

The project would comprise twin main alignment tunnels connecting Rozelle, at the Rozelle interchange near City West Link, to the Warringah Freeway at North Sydney. Each tunnel would accommodate three lanes of traffic. The tunnel portal at the Rozelle interchange is close to businesses in the Robert Street Industrial centre.

Chapter 5 of the environmental impact statement provides a project description identifying operational outcomes. The main operational effects on businesses would be from:

- Alterations in the intersection and road network performance across the Rozelle area
- Travel time alterations for both road and public transport network
- Improved connectivity between the north of the harbour and the south of the harbour.

Operational benefits

Benefits of operating the project include:

- Average travel speeds through the Rozelle area are predicted to substantially increase with more free-flowing traffic. This would improve the travel times for employees and customers accessing the centre
- The direct connection obtained with Western Harbour Tunnel substantially improves accessibility of the centre, potentially increasing the trade catchment of some businesses. The businesses most likely to benefit from this increased customer connectivity are the automotive services and repair
- The intersection performance of Victoria Road and Robert Street would remain consistent or improve in the morning and evening peak enhancing employee access to work
- Travel times on City West Link, Western Distributor and Victoria Road southbound would improve due to the reduction in traffic. Servicing, delivery and distribution would benefit from the increased efficiencies. Customers and employees would also benefit from improve transport efficiencies
- The automotive and supplier trade businesses in the centre may experience a marginal increase in demand for services due to the increased accessibility of the centre. As these are speciality services, competing centres are more distributed with the new cross-harbour connection creating the opportunity to tap into the Lower North Shore market.

Localised negative impacts

No localised negative impacts are identified.

Evaluation

The majority of businesses within the centre are destination services that customers visit specifically. The centre would marginally benefit from increased connectivity and accessibility with the capacity for trade catchments to expand and passing trade to improve. The benefits would primarily arise from improvements in access, with the identity and character of the centre unlikely to be affected by the project. Effects on character and amenity, employee productivity and communication and business visibility were not anticipated at this centre.

Conclusion

Overall, the project would have long term positive effects on the business environment.

6.1.1.3 James Craig Road working waterfront

As described in section 3.1.1.4, James Craig Road working waterfront contains a cluster of predominantly marine related industries, including dry storage, slipways, harbour cruises, government agency (Maritime NSW), public marina berths as well as supportive food services such as cafés.

Project outcomes

The project would comprise twin main alignment tunnels connecting Rozelle, at the Rozelle interchange near City West Link, to the Warringah Freeway at North Sydney. Each tunnel would accommodate three lanes of traffic. The tunnel portal at the Rozelle interchange is in close proximity to businesses within the James Craig Road working waterfront.

Chapter 5 of the environmental impact statement provides a project description identifying operational outcomes. The main operational effects on businesses would be from:

- Proximity to the portal location of the Western Harbour Tunnel with direct access in and out of the tunnel
- Improved travel times and connectivity between the north and south of the harbour.

Operational benefits

Benefits of operating the project include:

- Average travel speeds through the Rozelle area would increase substantially as a result of the project. This would substantially improve employee and customer access due to the very close proximity of the business centre to the tunnel portal. As the majority of businesses within the location are speciality services, it is likely that employees and customers travel from further afield. The introduction of the tunnel would improve access for these businesses, particularly for people travelling from the north of the harbour
- The White Bay Cruise ship terminal is located in this area with access to the terminal via James Craig Road and Robert Street. The improved travel times and enhanced connections would enhance the accessibility of the terminal for servicing and deliveries and customer and employee access
- Traffic demand through the Rozelle area is forecast to increase by 14 per cent. Due to the centre's prominent position on the waterfront and near the tunnel entry/exit, more people would see the businesses as they drive past the centre
- The trade catchment for the marina, dry storage, boat servicing facilities and boat hire may increase due to the enhanced connectivity. As these are speciality services, people are generally more inclined to travel further to access them. Improving the accessibility between the north and south of the harbour expands the catchment of these businesses, making them a more appealing option for those customers requiring marine services.

Localised negative impacts

Despite the benefits outlined above, some localised impacts may arise from project operation. Table 6-2 assesses the significance of these localised negative impacts. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 6-2: James Craig Road working waterfront operational issues appraisal

| Effects | Operational effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none">Delays at the City West Link and James Craig Road intersection could marginally increase during peak periods; given the increased traffic flow on City West Link, this would affect employee and customer access to the businesses. Although a slight worsening, the delays are still within an acceptable range. | Negligible | Low | Negligible |
| Character and amenity | <ul style="list-style-type: none">The area is anticipated to experience an increase in noise levels due to the introduction of the project. The environment is however already noise-affected with businesses generally not reliant on the pleasant amenityThe new road infrastructure would alter view corridors of the centre. Due to its waterfront location, the majority of businesses face the bay with the new transport infrastructure unlikely to affect business amenity. | Negligible | Low | Negligible |

Evaluation

The majority of businesses within the centre are generally destination services that customers visit specifically. The centre would benefit from increased connectivity and accessibility with the capacity for trade catchments to expand. Employee and customer access would substantially improve with both road network efficiency and connectivity improvements. Businesses in the area would experience enhanced visibility with the marine-related services also benefiting from a potentially enhanced demand for services. For businesses that are dependent on servicing, delivery and distribution, the new road infrastructure provides benefits. Effects on passing trade and employee productivity and communication were not anticipated at this centre.

Conclusion

Overall, the project would have long term positive effects on the business environment.

6.1.1.4 Chapman Road working waterfront

As described in section 3.1.1.5, Chapman Road working waterfront contains a small cluster of predominantly marine-related industries, including boat hire, a multihull marina, charter boating and a slipway.

Project outcomes

The project would comprise twin main alignment tunnels connecting Rozelle, at the Rozelle interchange near City West Link, to the Warringah Freeway at North Sydney. Each tunnel would accommodate three lanes of traffic. The tunnel portal at the Rozelle interchange is adjacent to Chapman Road working waterfront with the new infrastructure affecting access.

Project benefits

Benefits of operating the project include:

- Average travel speeds through the Rozelle area would increase substantially as a result of the project. This would substantially improve employee and customer access due to the very

close proximity of the business centre to the tunnel portal. As the majority of businesses within the location are speciality services, it is likely that employees and customers travel from further afield. The introduction of the tunnel would improve access for these businesses, particularly for people travelling from the north of the harbour

- The trade catchment for the marina (assuming capacity) and boat hire may increase due to the enhanced connectivity. As these are speciality services, people are generally more inclined to travel further to access them. Improving the accessibility between the north and south of the harbour expands the catchment of these businesses, making them a more appealing option for those customers requiring marine services.

Localised negative impacts

Despite the benefits outlined above, some localised impacts may arise from project operation that have the capacity to influence business operation. Table 6-3 assesses the significance of these localised negative impacts. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 6-3: Chapman Road working waterfront centre operational issues appraisal

| Issue | Operational effects | Sensitivity | Magnitude | Significance |
|------------------------------|---|-------------|------------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> The intersection of The Crescent and City West Link would experience increased delay as a result of the project, due to the additional movements introduced by the inclusion of the Western Harbour Tunnel exit at this location. | Negligible | Low | Negligible |
| Character and amenity | <ul style="list-style-type: none"> The area is anticipated to experience an increase in noise levels due to the introduction of the project. The environment is however already noise-affected with businesses generally not reliant on the pleasant amenity. | Negligible | Negligible | Negligible |

Evaluation

The majority of businesses within the centre are generally destination services that customers visit specifically. The centre would benefit from increased connectivity and accessibility with the capacity for customer trade catchments of the marina and boat hiring services to expand. Employee and customer access would substantially improve with both road network efficiency and connectivity improvements. Effects on passing trade, employee productivity and communication and business visibility were not anticipated at this centre.

Conclusion

Overall, the project would have long term positive effects on the business environment.

6.1.2 North Harbour Precinct

This section assesses business centres and businesses surrounding the centres within the North Harbour Precinct that have a higher likelihood of experiencing operational impacts.

6.1.2.1 North Sydney CBD

As described in section 5.1.2.3, North Sydney is part of the Harbour CBD within the Eastern Economic Corridor. Metropolitan centres exist to provide access to people, goods, services and information: the better and more efficient this access is, the greater the social and economic benefits are. The centre is oriented around commercial office uses with supporting residential, community facilities, retailers and food and beverage providers. The area is a large contributor to Greater Sydney's economic productivity servicing both a local and regional catchment.

Project outcomes

The Western Harbour Tunnel from the Rozelle area would surface at North Sydney and Cammeray. An off ramp would connect from the northbound mainline tunnel to Falcon Street, North Sydney and an on ramp would connect from Berry Street, North Sydney to the southbound mainline tunnel. The Warringah Freeway Upgrade would result in the reconfiguration and upgrades of various intersections, bridges and signal arrangements leading into North Sydney. These changes are intended to improve the flow and efficiency of the road network. Refer to Chapter 5 of the environmental impact statement for project description. The main operational effects on businesses would be from:

- Improved access capacity and connectivity for road based transport (public and private) from a range of origins and destinations
- Reduced traffic and improved pedestrian amenity, safety, and connectivity on Miller Street between Berry Street and the Pacific Highway (adjacent to the future Victoria Cross Metro station)
- Improved pedestrian and cyclist connections including:
 - A new shared user bridge between Cammeray Park and Anzac Park built immediately adjacent to the Ernest Street bridge
 - A new dedicated bicycle path along the eastern side of the Warringah Freeway between Miller Street at Cammeray and Ernest Street
- Changes in access arrangements for pedestrians, cyclists and motor vehicles
- Changes to parking arrangements and restrictions in some areas
- Changes in access to and from the Warringah Freeway.

Operational benefits

Benefits of operating the project include:

- The new motorway crossing enables the bypass of three highly congested sections of the existing motorway network. The Western Harbour Tunnel would provide a new connection between Rozelle and North Sydney; traffic forecasting indicates that this connection is forecast to improve travel times between these areas by up to 75 per cent, around 20-25 minutes by 2037 when compared to conditions without the project
- By reducing traffic and congestion on the existing eastern suburbs corridor, Western Harbour Tunnel is forecast to improve travel times by up to 10 minutes for trips to and from North Sydney via the existing harbour crossings during morning and evening peaks. These time savings mean that business catchment areas would expand when compared to conditions without the project, as customers further afield would continue to be able to bypass the city and access these businesses; those businesses offering speciality services or products are most likely to benefit from the expanded catchments
- The project would deliver an enhanced walking and cycling network to improve safety and enhance connectivity to the major employment centres. As well as improving conditions for pedestrians on Miller Street in the core of the CBD, a number of new shared paths, pedestrian bridges and intersections would be delivered as part of the project. This new pedestrian infrastructure contributes to the broader green-grid, improving connections for residents in the Lower North Shore and Inner West to North Sydney. The replacement of Ridge Street bridge with provision of a wider structure with dedicated cycle lanes and a pedestrian path would improve existing connections to North Sydney. These improvements would increase trade catchments
- The project would result in a reduction in road-based travel times which would substantially increase the number of people that can access North Sydney within 30 minutes. People living

in a variety of suburbs south of Sydney Harbour between the Inner West, Southern Sydney, and Eastern Suburbs would now be able to access North Sydney within 30 minutes

- The centre may experience an increase in demand for services due to expanded trade catchment with the operation of Western Harbour Tunnel, particularly businesses offering services that may not be available in local areas such as financial advisors, accountants and medical advisors
- The new pedestrian and cyclist connections and changed prioritisation of traffic signals would enhance the active transport network, improving connectivity for active transport commuters
- For deliveries and distribution, the project would improve accessibility from surrounding areas to the centre
- Improved pedestrian movement safety, capacity, and amenity along Miller Street in the core of the CBD.

As identified in the Technical working paper: Urban design, visual and landscape impact, the North Sydney CBD landscape character and visual amenity is unlikely to be adversely affected by the project. The proposed built form would be mostly congruous to the existing environment. Technical working paper: Noise and Vibration identifies that airborne noise effects for businesses fronting the Warringah Freeway Upgrade area are predicted to improve as a proportion of vehicles are redirected from the surface roads into the tunnel. As the area is already subject to high volumes of vehicle traffic noise, the change from the existing environment is likely to be minimal with the amenity and character of the area unlikely to change.

Localised negative impacts

Despite the numerous benefits outlined above, some localised impacts may arise from project operation that have the capacity to influence localised business operation. Table 6-4 assesses the significance of these localised negative impacts. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 6-4: North Sydney CBD operational issues appraisal

| Issue | Operational effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|-------------|-----------|--------------|
| Employee and customer access | <ul style="list-style-type: none"> • Some employee and business trade catchments would be altered as a result of travel time increases during peak periods. Some locations on the Lower North Shore could experience an increase in travel time to and from North Sydney CBD during AM peak periods. Bus commuters could experience increased localised delays during the busiest peak periods on some routes through North Sydney via Miller Street and along Pacific Highway, although most delays would be less than 5 minutes. For a small number of businesses this may affect: <ul style="list-style-type: none"> – employee productivity as more people may arrive later to work or and experience a slightly longer commute – daily routine of employees, possibly reducing their satisfaction with their location of work – some customers may be deterred from travelling to the centre due to some localised traffic congestion and longer travel times, resulting in a loss | Low | Low | Low |

| Issue | Operational effects | Sensitivity | Magnitude | Significance |
|------------------------|--|-------------|------------|--------------|
| | of trade to some specialised service businesses. | | | |
| Passing trade | <ul style="list-style-type: none"> Localised road changes and localised congestion has the potential to impact passing trade. This would mostly affect retail and personal service businesses. Passing trade in North Sydney is predominantly generated by pedestrian traffic Parking restrictions on Miller Street northbound between Pacific Highway and Berry Street would be implemented. This would particularly affect the small number of external retail and convenience shops and cafés located on the ground floor of the commercial buildings that benefit from the short-term parking. No additional restrictions are proposed outside the busiest peak traffic periods. This is already a highly pedestrianised area, any impact to passing trade would be minimal and during a short period of time and is unlikely to have substantial effects on business viability and revenue generation. The net increase in traffic flows to North Sydney throughout the day would also contribute to offsetting any potential impact. | Low | Negligible | Negligible |
| Servicing and delivery | <ul style="list-style-type: none"> Localised impacts due to increased localised traffic congestion, intersection delays and clearway operation would reduce mobility within the centre for servicing and deliveries during peak traffic periods. This reduction in mobility and efficiency of delivery services may increase overhead costs to businesses. Commercial office, food and non-food retailing would be most affected by the reduced local network efficiency The parking restrictions on Miller Street northbound between Pacific Highway and Berry Street would have the potential to impact the efficiencies and convenience of servicing and deliveries. These restrictions would only be during pm peak periods and would be unlikely to impact businesses as servicing, delivery and distribution generally occurs outside peak periods. Businesses would also have the ability to change the time of day that certain servicing and delivery occurs, so that it is outside of peak periods. | Low | Low | Low |
| Character and amenity | <ul style="list-style-type: none"> Sensitive businesses along Ridge Street, Elliot Street, Walker Street and Miller Street (closest to St Leonards Park) may be subject to marginal traffic noise level increases during operation. This includes the short-term accommodation, library, theatre and restaurants that are dependent on pleasant amenity. Alterations may deter a small proportion of customers, however this is unlikely to have a noticeable impact on trade. | Low | Negligible | Negligible |

| Issue | Operational effects | Sensitivity | Magnitude | Significance |
|---|--|-------------|------------|--------------|
| Employee productivity and communication | <ul style="list-style-type: none"> Airborne noise effects from traffic movement are anticipated for the project but would generally decrease from the existing environment as more vehicles are redirected into the tunnel. The North Sydney centre is already a high traffic area with buildings designed to attenuate noise. Employee productivity and communication capacity would be unlikely to be altered. | Low | Negligible | Negligible |
| Business visibility | <ul style="list-style-type: none"> Road alterations would affect business visibility as traffic is redistributed. Businesses along access routes to and from the tunnel, including those along Falcon Street and Berry Street – and connecting routes such as Miller Street and the Pacific Highway – may experience an increase in business visibility with additional vehicles passing these businesses. These are already high traffic areas with any changes unlikely to have substantial effects on business viability and revenue generation. | Low | Negligible | Negligible |

Evaluation

North Sydney is a high density, mixed-use and diverse metropolitan centre with a high level of employment and economic productivity. A part of this productivity is derived from the ease to which employees, customers, goods and services are able to get to and from the centre.

Although North Sydney would experience some localised impacts that would have minor effects on travel time from some localities, these impacts would generally be offset by the benefits arising from broader network improvements. Businesses in North Sydney would retain a high ability to absorb and adapt to the changes. For example, people working or visiting North Sydney CBD may choose to take an alternative transport method or route, leave earlier or later, or even just factor in more travel time. While localised impacts would be discernible, the project would have long-term strategic benefits, which would offset any localised impacts to access and connectivity experienced by businesses.

The project would result in an improvement in road-based travel times, on most routes, which would substantially increase the number of people that can access North Sydney within 30 minutes and improve network servicing and delivery efficiencies. The project would increase the potential trade catchment of a number of businesses in the centre and improve the labour catchment, increasing the appeal of North Sydney as place for business investment and as a place to work. These changes have the capacity to improve business productivity and revenue, enhancing the economic prosperity of the Harbour CBD.

Conclusion

The project would have long term strategic benefits, with few discernible localised impacts. Businesses would retain a high ability to absorb and adapt to any localised impacts.

Overall, the project would have a substantial positive outcome for businesses within North Sydney.

6.1.2.2 St Leonards–Crows Nest centre

As described in section 3.1.2.6, St Leonards–Crows Nest is a large centre within the Greater Sydney economic corridor. The centre contains a mix of uses including commercial offices, residential and community facilities, retailers and food and beverage providers. The area primarily services a local catchment with some larger businesses servicing the regional catchment.

Project outcomes

The Western Harbour Tunnel would connect the Rozelle area surfacing at the northern extent at North Sydney and Cammeray. A two-lane off ramp would connect from the northbound main alignment tunnel to Falcon Street, North Sydney and a two-lane on ramp would connect from Berry Street, North Sydney to the southbound main alignment tunnel. The Warringah Freeway Upgrade would accommodate the new Cammeray tunnel portal and would result in the reconfiguration and upgrades of various intersections, bridges and signal arrangements leading into St Leonards–Crows Nest. These changes are intended to improve the flow and efficiency of the road network. Refer to Chapter 5 of the environmental impact statement for project description. The main operational effects on businesses would be from:

- Improved travel times and road capacity along the Warringah Freeway
- Improved through connections to motorways south of the harbour due to Western Harbour Tunnel and the reduced demand on Sydney Harbour Tunnel and Sydney Harbour Bridge
- Changes to parking arrangements and restrictions along some sections of West Street in Crows Nest
- Western Harbour Tunnel connections via:
 - On ramp from Berry Street to the southbound tunnel
 - Off ramp from the northbound tunnel to Falcon Street
- Changed access arrangements removing direct connections between the Sydney Harbour Tunnel and Brook Street, Cammeray requiring alternative access to St Leonards and Crows Nest.

These effects are predominantly indirect, associated with traffic and transport efficiency.

Operational benefits

Benefits of operating the project include:

- The new motorway crossing enables the bypass of three highly congested sections of the existing motorway network. The Western Harbour Tunnel would provide a new connection between Rozelle and North Sydney; traffic forecasting indicates that this connection is forecast to improve travel times between these areas by up to 75 per cent, around 20-25 minutes by 2037 when compared to conditions without the project. While the connection is to North Sydney, the St Leonards-Crows Nest centre is a significant employment node and would also substantially benefit from improved connections. This would have benefits to employee and customer connectivity as well as servicing and deliveries
- The centre may experience an increase in demand for services due to expanded trade catchment with the operation of Western Harbour Tunnel, particularly businesses offering services that may not be available in local areas such as financial advisors, accountants and medical advisors.

Localised negative impacts

Despite the numerous benefits outlined above, some localised impacts may arise from project operation that have the capacity to influence business operation.

Table 6-5 assesses the significance of these localised negative impacts. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 6-5: St Leonards–Crows Nest centre operation issues appraisal

| Issue | Operational effects | Sensitivity | Magnitude | Significance |
|------------------------|--|-------------|------------|--------------|
| Servicing and delivery | <ul style="list-style-type: none"> Some servicing and deliveries may be affected by the alternative route arrangements, potentially resulting in delays or inefficiencies. This would particularly affect businesses that receive or distribute products or stock such as retailers, food and beverage outlets. | Low | Negligible | Negligible |

Evaluation

The centre has a number of retail services that would be more sensitive to changes in servicing and delivery, however most would retain a high ability to adapt and absorb the change. The operational changes may cause shorter term inefficiencies as people get used to the changes. Generally, the scale of change would be limited to businesses in a small geographic area. Effects on passing trade, character and amenity, employee productivity and communication, business visibility and demand for services were not anticipated.

The project would result in an improvement in road-based travel times, on most routes, which would substantially increase the number of people that can access St Leonards-Crows Nest strategic centre within 30 minutes and improve network servicing and delivery efficiencies. The project would increase the potential trade catchment of businesses in the centre and improve the labour catchment, increasing the appeal of St Leonards-Crows Nest as place for business investment and as a place to work. These changes have the capacity to improve business productivity and revenue, enhancing the economic prosperity of the strategic centre.

Conclusion

Overall, the project would have long term positive effects on the business environment.

6.1.2.3 Neutral Bay Junction

As described in 3.1.2.8, Neutral Bay Junction is a mixed-use centre comprising a variation of residential, retailing and commercial office premises.

Project outcomes

Chapter 5 of the environmental impact statement for project description describes the project in more detail; however, the main operational effects on businesses would be from:

- Changes to parking arrangements and restrictions along some sections of Ernest Street, Cammeray and some sections of Ben Boyd Road
- Change in visual amenity due to permanent infrastructure – the ventilation outlet and facility would constitute new vertical built form within the view frame of the Cammeray Golf Course and sporting facilities.

These effects are predominantly indirect, associated with traffic and transport efficiency.

Operational benefits

Benefits of operating the project include:

- The improved performance of Falcon Street intersection and the broader network improvements including increased accessibility and travel times would benefit servicing and deliveries for the centre. This would particularly benefit businesses that receive or distribute products or stock such as retailers, food and beverage outlets
- The close proximity of the business centre to the Western Harbour Tunnel entry portal may expand the trade catchment of some businesses. This would primarily benefit the entertainment and restaurant businesses for which customers may be prepared to travel further

- Improved access to and travel times on the Sydney Harbour Bridge and Sydney Harbour Tunnel due to redistribution of traffic flows, enhancing employee connectivity and customer access.

Localised negative impacts

Despite the benefits outlined above, some localised impacts may arise from project operation that have the capacity to influence business operation. Table 6-6 assesses the significance of these localised negative impacts. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 6-6: Neutral Bay Junction operation issues appraisal

| Issue | Operational effects | Sensitivity | Magnitude | Significance |
|------------------------------|--|--|--|--------------|
| Employee and customer access | <ul style="list-style-type: none"> Parking alterations on Ben Boyd Road and Ernest Street. Businesses are generally not reliant on these spaces. | Negligible | Negligible | Negligible |
| Character and amenity | <ul style="list-style-type: none"> Cammeray Golf Course and clubhouse – operational visual impact would be moderate to high. The motorway control centre and ventilation facility would constitute major new built form within the view, adversely affecting the visual amenity of the club users. As the clubhouse is used for events and functions, this long-term change could impact on business revenue. The impact would be reduced by the retention of screening vegetation along the boundary of sports facilities. The character and amenity of the Neutral Bay Junction shopping precinct would remain consistent. | Moderate for business Negligible for centre | Moderate for business Negligible for centre | Negligible |
| Demand for services | <ul style="list-style-type: none"> The permanent change in configurations of holes at the golf course may reduce the membership and visitation appeal of the club, having ongoing effects on business revenue of both the club and supporting businesses such as the pro-shop. This change has the capacity to affect business viability in the longer term and may affect the ability of the business to remain operational. Consultation with the golf course owner will discuss mitigation of these impacts. | Moderate for business Negligible for centre | Moderate for business Negligible for centre | Negligible |

Evaluation

Neutral Bay Junction would likely benefit from the increase in accessibility. Although the business centre is not located directly adjoining the Western Harbour Tunnel interchange, it is positioned on a main feeder road with the capacity to benefit from increased vehicle movements past the centre. The additional connection across the harbour to Rozelle and improved traffic flow across Sydney Harbour Bridge and Tunnel also has the capacity to increase the trade area of some businesses, with the area now more accessible to a broader customer catchment.

Any negative impacts are generally confined to the Cammeray Golf Course. Due to the permanent reduction in the service offering and reduced amenity, demand from customers may reduce and affect business viability. The broader centre would be able to adapt to the change. Effects on employee and customer access, passing trade, servicing and delivery, character and amenity, employee productivity and communication, business visibility and demand for services were not anticipated.

Conclusion

The project would improve connectivity to the centre from surrounding areas, including expanding the trade catchment of some population-serving businesses.

Overall, the project would have long term positive effects on the business environment.

6.1.2.4 Artarmon industrial

As described in section 3.1.2.9, Artarmon industrial centre is oriented around automotive, bulky goods, warehousing, film-related industries and specialty manufacturing. The precinct is a major distributor of goods and services and would be heavily dependent on access.

Project outcomes

Chapter 5 (Project Description) of the environmental impact statement describes the project in more detail; however the main operational effects on businesses would be from:

- A motorway control centre would be located at Waltham Street, comprising a building with an area of about 2,500 square metres and a height of about five metres. It would be continuously staffed and used to monitor, and if necessary, respond to, conditions in the project tunnels and on surface road connections
- Landscape treatments would include planting around the motorway control centre site
- Improved travel times and road capacity along the Warringah Freeway
- Improved through connections to motorways south of the harbour due to Western Harbour Tunnel and the reduced demand on Sydney Harbour Tunnel and Sydney Harbour Bridge.

Operational benefits

Benefits of operating the project include:

- Average travel speeds along Warringah Freeway and across Sydney Harbour would increase substantially as a result of the project. This would improve the travel times for employees and customers accessing the centre if they are travelling from the south along the freeway
- Businesses could potentially attract from a wider employee catchment with the inclusion of the Inner West within an accessible drive-time distance
- The additional direct connection provided by Western Harbour Tunnel substantially improves accessibility of the centre, potentially increasing the customer trade catchment of some businesses. The businesses most likely to benefit from this increased customer connectivity are the automotive services and bulky goods retailers
- The industrial area may experience an increase in demand for services due to expanded trade catchment with the operation of Western Harbour Tunnel, particularly businesses offering services that may not be available in local areas
- Travel times by the harbour crossing network would improve with additional spare capacity created on the Sydney Harbour Bridge and through the Sydney Harbour Tunnel with the introduction of the Western Harbour Tunnel. This improves the efficiency and connectivity to the major port and freight facilities. With growing demand for 'last-mile' product distribution, the greater connectivity also enhances the efficiency of delivery to customers with a wider catchment now within closer drive times. This would be particularly beneficial for bulky goods retailers within the centre.

Localised negative impacts

No localised negative impacts were identified.

Evaluation

The majority of businesses within the centre are generally destination services that customers visit specifically. The centre would substantially benefit from increased connectivity and accessibility with the capacity for trade catchments to expand. The benefits would arise from improvements in access, with the identity and character of the centre unlikely to be affected by the project. Effects on passing trade, character and amenity, employee productivity and communication and business visibility were not anticipated.

Conclusion

Overall, the project would have long term positive effects on the business environment.

6.2 Broader operational effects

6.2.1 Freight and efficiency costs

Section 5.3.1 detailed the importance of the freight and distribution network to the broader economy. One of the objectives of the project is to encourage heavy and commercial vehicles to utilise the proposed tunnels over surface roads. The Technical working paper: Traffic and Transport estimated that there would be about 7,000 daily heavy vehicle movements (3,800 northbound and 3,300 southbound) utilising the Western Harbour Tunnel over other major crossings around the time of opening in 2027. The introduction of the Western Harbour Tunnel would alleviate capacity at other key locations, with the project indicating a combined northbound and southbound reduction on all key roads compared to the do minimum scenario. Specifically:

- Sydney Harbour Bridge – 3,300 fewer daily heavy vehicle movements in 2027 increasing to 3,800 in 2037
- Sydney Harbour Tunnel – 1,200 fewer daily heavy vehicle movements in 2027 increasing to 1,300 in 2037
- Gladesville Bridge – 1,100 fewer daily heavy vehicle movements in 2027 increasing to 1,700 in 2037
- ANZAC Bridge – 2,900 fewer daily heavy vehicle movements in 2027 increasing to 3,100 in 2037
- Western Distributor – 3,700 fewer daily heavy vehicle movements in 2027 increasing to 4,200 in 2037.

The proposal would provide substantial travel time savings, particularly for freight trips that currently use the Sydney Harbour Bridge.

Evaluation

Although unlikely to directly affect business and business centres through improvements in amenity, the additional capacity and travel time savings would improve product distribution and delivery, generating direct cost savings to businesses.

Conclusion

The project would have positive long-term effects with the capacity to benefit businesses nationally through improved network efficiencies and cost savings.

6.2.2 Employment and customer connectivity

As identified in section 3.1 the *Greater Sydney Region Plan* identifies three types of centres: metropolitan city, strategic and local. These centres vary in terms of scale and contribution to Greater Sydney's employment opportunity and productivity as well as service provision to local communities. The provision of transport infrastructure influences the role and significance of a centre and its capacity to attract business, employees and visitors.

The *Greater Sydney Region Plan* states the vision to deliver a '30 minute city', where people can conveniently access jobs and services within 30 minutes by public or active transport, seven days a week. The project would create opportunities on the network to deliver more public and active transport solutions. It would also assist in enabling more people to access jobs, shops and services within 30 minutes by all forms of road transport, including buses. This is integral to sustaining the economic competitiveness of Greater Sydney as an attractive place for investment, businesses and skilled workers.

The introduction of this additional transport connection improves the efficiency and capacity of the broader road, public and active transport network, assisting in the alleviation of congestion and improving travel times. The project would have a direct consequence on employment and customer connectivity, enhancing access to the strategic centres of North Sydney and St Leonards and the metropolitan Harbour CBD.

Road

The Western Harbour Tunnel would improve transport connections between the north and south of the Sydney Harbour through the provision of an additional harbour crossing that bypasses the Sydney CBD. As identified in the Technical working paper: Traffic and transport, the greatest benefit of the project would be for trips between North Sydney and Rozelle. The new motorway crossing enables the bypass of three highly congested sections of the motorway, reducing travel times between North Sydney and Rozelle by up to 75 per cent. Travel times would also be reduced for trips via the Sydney Harbour Tunnel and Eastern Distributor primarily as a result of a reduction in traffic demand on these sections.

Public transport

The project would remove direct interaction between buses and general traffic on the approach to the Sydney Harbour Bridge, thereby improving southbound bus services on the Warringah Freeway. A new dedicated southbound bus lane would extend from Miller Street to Sydney Harbour Bridge, with new bus lane bridges connecting bus services to this lane from Falcon Street and Mount Street. As identified in the Technical working paper: Traffic and transport, the introduction of the project is also anticipated to alter bus movements and affect travel time efficiencies for employees and customers, specifically:

- Improvements:
 - In travel time for buses travelling from Gore Hill Freeway to the Sydney Harbour Bridge in the southbound morning peak due to the reconfiguration of southbound bus lanes
 - In travel time for buses travelling to and from Falcon Street in the morning peak as a result of the reconfiguration of the southbound bus lanes
 - In travel time for buses travelling southbound across the ANZAC Bridge and Western Distributor during the morning peak, due to redistribution of some traffic into the Western Harbour Tunnel
- Increased travel times:
 - On bus routes through North Sydney via Miller Street as a result of the project
 - Along Victoria Road in the morning peak due to increased local traffic volumes heading north on Victoria Road and merging with M4-M5 Link traffic exiting to Victoria Road south of Iron Cove Bridge.

Enhancing the capacity of the road network and alleviating traffic congestion would generally improve the efficiency of the public transport network.

Pedestrian and cyclist

The project intends to deliver an enhanced active transport network to improve safety and enhance connectivity to the major employment centres. A number of new shared paths, pedestrian bridges and intersections would be delivered as part of the project. This new pedestrian infrastructure contributes to the broader green-grid, improving connections of residents in the Lower North Shore and Inner West to the employment centres of North Sydney, St Leonards, Crows Nest and the Harbour CBD. New or improved infrastructure that contributes to the broader active transport network which includes:

- Replacement of Ridge Street bridge with provision of a wider structure with dedicated cycle lanes and a pedestrian path (improving connection to North Sydney and Crows Nest)
- A new shared user bridge between Cammeray Park and Anzac Park built immediately adjacent to the Ernest Street bridge
- A new dedicated cycleway on the eastern side of the Warringah Freeway between Miller Street and Falcon Street (enhancing access to the Harbour CBD, North Sydney, Crows Nest, Miller Street and Neutral Bay).

Evaluation

The ease of access to a place of employment is a factor in attracting or deterring existing or potential employees from remaining in a job or applying for a job. A place of work that becomes difficult to access begins to jeopardise the time an individual has to spend with family and friends or on non-work-related activities and may cause individuals to seek alternative employment options as their 'travel time budget' is exceeded. A 'travel time budget' is the theory that commuters have a time limit which they are willing to spend travelling to work. As commute times increase, worker productivity and employee work-life balance diminish, resulting in people seeking alternative employment closer to home or moving closer to work to reduce time spent travelling.

Improved efficiencies in journey-to-work time expands employment opportunities and increases worker productivity and work-life balance as more time is spent in the office or at home rather than commuting. Additional capacity on the road, bus and active transport network enhances the accessibility of the city and subsequently employment options. The project would deliver long-term improvements to the existing situation for a large number of businesses and business centres within the region.

Conclusion

Overall, the project would have long term positive effects on the business environment.

6.2.3 Altered trade catchments

A business trade area (or catchment) is defined as the geographic areas from which a business draws its customers or to which it provides services. At its simplest, the extent of a business trade area varies depending on the type of product or service provided the relative location of competitors and the degree of mobility of customers or service providers. Other factors such as socio-economic status of clientele, geographic barriers, efficiency of transport networks, perceived and actual distance and travel time and appeal of a business centre also contribute to the definition of a trade area.

The introduction of an additional transport connection, which increases the efficiency of a network and connectivity across a broader geographic area, can lead to expanded trade catchment opportunities. The primary trade catchment (the area from which the business attracts or services 60–65 per cent of customers) is likely to remain consistent, however there is capacity for the secondary trade catchment (the area from which the business attracts or services 20–30 per cent of customers) to increase.

Sydney Harbour is a geographic barrier that restricts trade catchments. Although connections currently exist, they are constrained by pinch point locations where the crossing of the water body is required. The introduction of a new motorway standard connection across Sydney Harbour would

increase the cross-harbour capacity and reduce existing congesting and capacity constraints on Sydney Harbour Bridge, Sydney Harbour Tunnel, and ANZAC Bridge.

With the Western Harbour Tunnel in place, the connection between Rozelle and North Sydney would be over fifteen minutes faster in both directions, compared to the do minimum scenario in 2027 and 2037. The Moore Park to North Sydney connection, although not as substantial would still experience travel time savings in morning peak and evening peaks (excluding in the northern direction).

Evaluation

Travel time savings mean that business catchment areas based on travel time would expand, as customers further afield would now be able to bypass the city and access these businesses. Although not all centres would experience the expanded trade catchment benefits, those businesses offering speciality services or products, or destination centres (such as North Sydney) may benefit from the expanded catchments.

Conclusion

Overall, the project would have long term positive effects on the business environment.

6.2.4 Tolling

Although no decision on tolls has yet been made, provision for new toll gantries would also be included on northbound locations of the Sydney Harbour Bridge and Sydney Harbour Tunnel, should the Government elect to apply northbound tolls to these crossings.

The rationale for potentially introducing northbound tolling includes:

- Simpler and more legible tolling scheme for harbour crossings
- Reduction of distorted traffic patterns that currently occur as a result of asymmetric cross-harbour trip patterns, particularly on Victoria Road

The potential introduction of northbound tolling where it currently does not exist may add expense to businesses, employees and customers crossing the harbour, however it is rationalised that any changes to the cost of travelling north across Sydney Harbour via tolled roads would be offset by the capacity increases and associated reduction in travel times provided by the project.

The potential additional tolling expense may deter some customers from driving to a business centre (that induces a toll charge) if there is another centre offering similar services in a location without the toll charge. This would cause a redistribution of customer expenditure, potentially benefiting some locations while others are disadvantaged.

Table 6-7 assesses negative impacts that may arise from project tolling that have the capacity to influence business operation. As discussed in section 2.5.3, only negative impacts have been assigned a level of significance in accordance with the methodology used for this assessment.

Table 6-7: Tolling operational issues appraisal

| Sensitivity | Magnitude | Significance |
|---|---|--|
| Although no decision on tolls has yet been made, if new or increased tolling was introduced, this road tolling would predominantly be a cost to individuals with the cost to business negated by the improved efficiencies. Business generally would have minimal vulnerabilities and a high ability to absorb and adapt to changes in tolling. | The introduction of new or increased tolling, should it occur, would present a discernible change to the baseline environment. Change from the baseline does however remain within the range commonly experienced by receptors. | Overall the level of significance would be moderate-low. |
| Moderate | Low | Moderate-low |

Evaluation

Although customer behaviour may alter, the trade catchments of businesses would generally remain consistent as customer expenditure is redistributed equally on either side of the connection.

The direct cost to businesses as a result of paying the additional road toll charge would be negligible as travel time savings would be incurred from the additional road capacity. Similarly, employees who drive to work may incur an additional individual cost, however this would be somewhat offset by reductions in congestion and travel time savings.

Conclusion

Overall, although the potential introduction of tolling would be a direct cost to businesses and persons, should tolling be introduced the travel time savings would offset some of the negative impacts. Negative effects would be minimal.

7.0 CUMULATIVE IMPACT ASSESSMENT

This chapter provides an overview of the potential cumulative impacts associated with the construction of the project and identifies mitigation measures to minimise these impacts.

7.1 Nature of cumulative impact

Cumulative impacts are those that result from the successive, incremental or combined effects of a project when added to other existing, planned, or reasonably anticipated future projects. The cumulative effect of multiple projects may decrease or intensify the benefits or negative impacts on a business or business centre. Cumulative impacts associated with transport and infrastructure projects include:

- Extended periods of construction impacting local amenity and altering the character and identity of a local centre
- Extended periods of traffic disruptions affecting customers, employees, visitors, suppliers and commercial vehicle movements
- Economic effects including changes to business operation and revenues
- Construction traffic from multiple projects placing additional pressure on road networks and parking capacity
- Consultation and construction fatigue for local communities and businesses due to the concurrent or sequential planning and construction nature of the project.
- Cumulative benefit associated with improved connections across a network of infrastructure enhancing accessibility for business and industry, including freight.

Construction fatigue relates to receivers that experience construction impacts from a variety of projects over an extended period of time with few or no breaks between construction periods. Construction fatigue may be brought on through traffic and access disruptions, increased noise and vibration, reduced air quality, reduced visual amenity, increases in impacts on business workers/owners or any combination of these factors.

The key areas where construction fatigue would be expected are Rozelle and North Sydney. These locations are discussed in more detail below.

7.2 Cumulative construction effects

The projects and local strategic plans considered in this assessment are listed in Table 7-1 and Table 7-2.

Table 7-1: Projects assessed in the cumulative impact assessment

| Project name | Brief project description | Project overlap | Indicative timeframes | Relevant business centres | Potential impacts |
|--|--|---|-----------------------|--|---|
| Beaches Link and Gore Hill Freeway Connection | The Beaches Link and Gore Hill Freeway Connection project comprises a new tolled motorway tunnel connection from the Warringah Freeway to Balgowlah and Frenchs Forest and upgrade and integration works to connect to the Gore Hill Freeway. | Western Harbour Tunnel Warringah Freeway Upgrade | 2021–2026 | Artarmon Miller Street, Camberay | <ul style="list-style-type: none"> Extended periods of construction affecting traffic and local amenity Increase in passing trade for convenience and food and beverage retail businesses |
| Sydney Metro City & Southwest | <p>The Chatswood to Sydenham component of Sydney Metro City & Southwest involves the construction and operation of a 15.5 kilometre metro line from Chatswood, under Sydney Harbour and through Sydney's CBD out to Sydenham.</p> <p>Components of the project relevant to this assessment include:</p> <ul style="list-style-type: none"> Victoria Cross Station Blues Point temporary construction support site Barangaroo Station. | Western Harbour Tunnel Warringah Freeway Upgrade | 2017–2024 | James Craig Road Waverton North Sydney St Leonards–Crows Nest | <ul style="list-style-type: none"> Increase in passing trade for convenience and food and beverage retail businesses Construction fatigue Extended periods of construction affecting traffic and local amenity |
| M4-M5 Link | The M4-M5 Link project includes an interchange at Rozelle with provision for a future connection to the Western Harbour Tunnel and Beaches Link. It also includes an underground tunnel between the ANZAC Bridge and Victoria Road near Iron Cove Bridge, known as the 'Iron Cove Link'. | Western Harbour Tunnel | 2018–2023 | Darling Street/ Victoria Road Rozelle James Craig Road and Chapman Road Working Waterfront Robert Street Industrial | <ul style="list-style-type: none"> Construction fatigue Extended periods of construction affecting traffic and local amenity Increase in passing trade for convenience and food and beverage retail businesses |

Table 7-2: Other strategic plans considered in the cumulative impact assessment

| Strategic plan | Brief description | Relevant business locations |
|---|---|--|
| The Bays Precinct Urban Transformation Plan | <p>This 20–30-year plan provides for a mix of cultural, maritime, recreational, retail and commercial uses around eight waterfront locations including White Bay Power Station, Glebe Island, White Bay, Blackwattle Bay (including Sydney Fish Market), Wentworth Park, Rozelle Bay, Bays Waterways and Rozelle Rail Yards.</p> <p>UrbanGrowth NSW Development Corporation is currently conducting studies to inform plans for the Bays Markets District (Blackwattle Bay) and White Bay Power Station, which cover locations relevant to this assessment.</p> | James Craig Road and Chapman Road working waterfront |
| Draft Ward Street Precinct Masterplan (North Sydney) | This draft masterplan by North Sydney Council proposes to replace the Ward Street car park at North Sydney with a major new community facility and a public plaza connected by active, pedestrian-focussed laneways. New planning controls are also proposed for a number of sites within the precinct. | North Sydney |
| Ridge Street carpark redevelopment strategy (North Sydney) | <p>North Sydney Council have adopted a concept strategy for the future of the Ridge Street car park site. The adopted concept includes:</p> <ul style="list-style-type: none"> • Underground parking • Retail uses fronting Ridge Street and James Place • Recreation space • Various internal spaces available for ancillary or community uses. | North Sydney |

7.3 Potential cumulative operational impacts

Once operational, the Western Harbour Tunnel and Warringah Freeway Upgrade project, alongside the other major transport projects, is predicted to deliver beneficial cumulative impacts for businesses.

These include:

- Supporting Sydney's long-term economic and employment growth through improved transport connectivity to key employment areas across the city
- Alleviating congestion and contributing to improved connectivity, speeds, reliability and safety of the broader road network, which is of particular importance to the contribution and efficiencies of the freight industry
- Generating economic effects and benefits to businesses through reduced operational expenses and opportunity for increased revenues
- Improved business centre viability and regeneration opportunity as a result of new connections
- Improved connections across the network, enhancing accessibility for customers and employees and creating greater opportunity for business synergies.

The projects and transformation strategies considered in this assessment are listed in Table 7-3.

Table 7-3: Cumulative operation impacts on business

| Project name | Brief project description | Potential business benefits |
|---|--|---|
| Beaches Link and Gore Hill Freeway Connection | The Beaches Link and Gore Hill Freeway Connection project comprises a new tolled motorway tunnel connection from the Warringah Freeway to Balgowlah and Frenchs Forest and upgrade and integration works to connect to the Gore Hill Freeway. | <ul style="list-style-type: none"> Enhanced trade catchments for larger centres such as Artarmon, St Leonards–Crows Nest and North Sydney. Improved amenity for business centres along Military Road with reduced traffic volumes. Improved freight and efficiency. |
| M4-M5 Link | The M4-M5 Link project includes an interchange at Rozelle with provision for a future connection to the Western Harbour Tunnel and Beaches Link. It also includes an underground tunnel from the Rozelle Interchange to Victoria Road near Iron Cove Bridge, known as the 'Iron Cove Link'. | <ul style="list-style-type: none"> Enhanced freight and efficiency Improved connections to port and airport Particular benefits for large industrial areas such as Artarmon. |
| New M5 | <p>Duplicating the M5 East from King Georges Road in Beverly Hills with tunnels from Kingsgrove to a new interchange at St Peters. The St Peters interchange would allow for future connections to the proposed future Sydney Gateway.</p> <p>The New M5 tunnels include provision for a future connection to the proposed Southern Connector (part of the proposed F6 Extension) and the M4-M5 Link.</p> | Coupled with the New M5 project and the M4-M5 Link project, the Western Harbour Tunnel would substantially enhance the efficiency of the freight and commercial vehicle network – creating benefits for businesses. |
| Sydney Gateway | New and upgraded sections of road are proposed between the proposed New M5 St Peters Interchange, International Airport, Domestic Airport and Joyce Drive. | The Sydney Gateway project, coupled with the M4-M5 Link and Western Harbour Tunnel would significantly enhance connectivity to the port and airport by linking Port Botany and Sydney Kingsford Smith Airport to WestConnex increasing opportunity for product distribution. The bulky goods and warehousing services industry at Artarmon would be one of the beneficiaries through improved connectivity to these destinations via Western Harbour Tunnel, M4-M5 Link and Sydney Gateway. |
| Bays Precinct Urban Transformation Plan | <p>This 20–30-year plan provides for a mix of cultural, maritime, recreational, retail and commercial uses around waterfront locations including White Bay Power Station, Glebe Island, White Bay, Blackwattle Bay, Sydney Fish Market, Wentworth Park, Rozelle Bay and Waterways and Rozelle Rail Yards.</p> <p>UrbanGrowth NSW Development Corporation is currently conducting studies to inform plans for the Bays Markets District (Blackwattle Bay) and White Bay Power Station, which cover locations relevant to this assessment.</p> | The Western Harbour Tunnel and Warringah Freeway Upgrade creates additional capacity on the road network. This enables opportunity for further densification of areas around the bay, with residential and commercial development. Any increased residential density is beneficial for businesses in the South Precinct. |

8.0 MANAGEMENT MEASURES

To mitigate the impacts on local businesses and operations during construction and operation of the project, a range of mitigation measures have been identified as set out in Table 8-1.

Table 8-1: Environmental management measures – business

| Ref | Environmental management measure |
|-----|---|
| BU1 | Where businesses are affected by property acquisition or lease cessation, the acquisition and compensation process will be implemented in line with the <i>Determination of compensation following the acquisition of a business guideline</i> . Compensation for a business conducted on land that is acquired will be determined in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991 (NSW)</i> , as relevant. |
| BU2 | Specific consultation will be carried out with businesses potentially impacted during construction. Consultation will aim to identify specific potential construction impacts for individual businesses. |
| BU3 | Based on consultation with businesses, specific feasible and reasonable measures to maintain business access, visibility and parking and address other potential impacts as they arise through the construction process will be identified and implemented. A phone hotline that enables businesses to find out about the project or register any issues will be maintained. |

9.0 REFERENCES

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- ABS (2016). Census 2016
- ABS place of work – SA2 level
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- ERM (2020). *Technical working paper: Air quality* (Appendix H of EIS)
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- Jacobs (2020). *Technical Working paper: Traffic and transport* (Appendix F of EIS)
- Northern Beaches Council (2017), Northern Beaches Hospital Precinct Structure Plan
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- NSW Government. Bureau of Transport Statistics
- NSW Government. (n.d). Determination of compensation following the acquisition of a business guide
- NSW Government (2013), Long Term Transport Master Plan
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- Ridge Street carpark redevelopment strategy
- Roads and Maritime (2013). *Socio-economic Assessment Practice Note EIA-N05*
- Transport for NSW (2013). NSW Freight and Port Strategy.
- Transport for NSW (2017). NSW draft Freight and Ports Plan
- Transport for NSW (2017). Transport Performance and Analytics, 2017
- WSP and Arup (2020). *Technical Working Paper: Urban design, visual and landscape impact* (Appendix V)

APPENDICES

APPENDIX A: BUSINESS SURVEY

Business survey

1. Were you already aware of the project?

☐ Yes

☐ No

2. Do you agree that once complete, the project would be a positive for businesses within the area?

☐ Strongly agree

☐ Agree somewhat

☐ About the same

☐ Disagree somewhat

☐ Strongly disagree

☐ Not Sure

3. Where is your closest competing business centre?

4. Where do the majority of your customers travel from?

☐ Suburb

☐ Local Government Area

☐ District (i.e Inner West)

☐ Greater Sydney (or wider)

5. Is your business sensitive to any of the following?

| | Not at all | Slightly | Moderately | Majorly |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Noise | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Vibration | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Air quality (construction dust) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Unpleasant odours | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Congestion | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Travel time delays | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

6. How dependent is your business any of the following:

| | Not at all | Slightly | Moderately | Majorly |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Other businesses in the area | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Recreation and community facilities in the area | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Passing trade (Motor vehicle) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Passing trade (Pedestrian and cyclist) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Pleasant visual amenity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Convenient customer parking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Business exposure (visibility) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Identity and character of business area | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| On-street parking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Loading zones | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

7. During the construction phase, what effect would the project have on the following?

| | Positive | Neutral | Negative |
|-------------------------------------|-----------------------|-----------------------|-----------------------|
| Business revenue | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Passing trade | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Employee and customer access | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Servicing and deliveries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Business amenity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Visibility of business to customers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Demand for services/products | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Other (please specify)

8. During the operation phase, what effect would the project have on the following?

| | Positive | Neutral | Negative |
|-------------------------------------|-----------------------|-----------------------|-----------------------|
| Business revenue | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Passing trade | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Employee and customer access | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Servicing and deliveries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Business amenity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Visibility of business to customers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Demand for services/products | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Other (please specify)

Business information

9. Are you an owner occupier or a tenant?

- ☐ Owner
- ☐ Tenant
- ☐ Unsure

10. How long have you been operating in the area?

- ☐ Less than 1 year
- ☐ 1-3 years
- ☐ 3-5 years
- ☐ More than 5 years

11. Do you plan to be here in five years?

- ☐ Yes
- ☐ No
- ☐ Unsure

12. What are your main trading days?

- ☐ Weekdays (Monday to Friday)
- ☐ Monday to Saturday
- ☐ Seven days
- ☐ Other (please specify)

13. When are you open?

- ☐ Before 10am
- ☐ 10am - 5pm
- ☐ 5pm - 9pm
- ☐ After 9pm

14. Number of staff?

- ☐ 0-10
- ☐ 11-20
- ☐ 21-50
- ☐ 50+

15. How do your staff usually travel to your business?

- ☐ Private car
- ☐ Walk/Cycle
- ☐ Public transport
- ☐ Other (please specify)

16. How do your clients/customers usually travel to your business?

- ☐ Private car
- ☐ Walk/Cycle
- ☐ Public transport
- ☐ Other (please specify)

17. Do you have parking, if so how many spaces?

18. Approximate number of customers per day?

19. Average dollar spend per customer

- ☐ 0-50
- ☐ 50-100
- ☐ 100 +

20. Do you have any other feedback or comments you would like to provide? (Surveyor to record feedback/comments provided at any point during the survey)

CONFIDENTIAL - Survey facilitator to fill out

21. Name of business

22. Business type?

- ☐ Retail
- ☐ Food / Beverage
- ☐ Recreational services / tourism
- ☐ Professional services / finance
- ☐ Construction
- ☐ Health care
- ☐ Education
- ☐ Wholesale
- ☐ Other (please specify)

23. Project area

- ☐ Western Harbour Tunnel
- ☐ Beaches Link

24. Address of business

APPENDIX B: BUSINESS SURVEY REPORT

In order to identify potential impacts associated with the project, 182 businesses located along the proposed route were surveyed. These surveys were completed between 13 and 30 November 2017. The following Appendix provides an overview of the core themes and responses to the business surveys. The implications of the findings and how they relate to the project have been discussed in chapters 4, 5 and 6.

The survey methodology is discussed in section 2 and the business survey itself can be found in Appendix A. Only publicly available information regarding the project was provided to the survey respondents to inform their responses. This included the initial design and preliminary planning information.

Businesses were surveyed in nine locations and the number of surveys carried out in each location was as follows:

Table 9-1: Number of business surveys conducted

| Survey location | Number surveyed |
|------------------------------|-----------------|
| Balmain | 17 |
| Cammeray | 17 |
| Military Road | 30 |
| North Sydney | 40 |
| Robert Street, Rozelle | 15 |
| Spit Junction | 18 |
| Victoria Road/Darling Street | 39 |
| Waverton | 6 |
| Artarmon Industrial | 33 |

The number of surveys collected in each precinct varied slightly depending on the precinct's size and number of businesses present. Every effort was made to survey a range of business types across the study area.

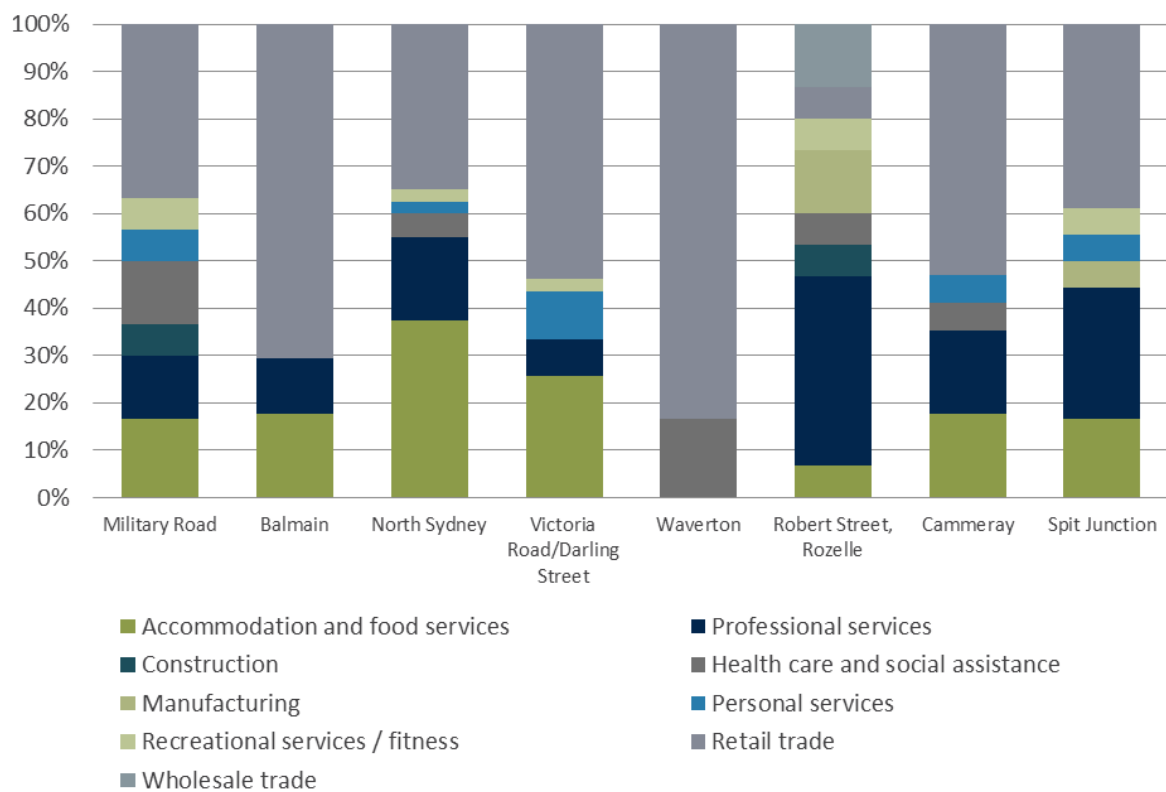
Business Types

Of the businesses surveyed, 44 per cent were classified as retail operations with the greatest located in Balmain and Waverton. This was followed by 22 per cent classified as accommodation and food services and 16 per cent as professional services. These made up a notable proportion of most survey locations. However, they were absent from or made up a low proportion of businesses in Waverton (which is a small local centre) and Rozelle (which is an industrial hub for automotive businesses).

Businesses classified as healthcare or social assistance and personal services both made up five per cent respectively. Recreational services/fitness businesses made up three per cent of those surveyed with manufacturing and construction amounting to two per cent respectively and Wholesale Trade making up the final one per cent.

The breakdown of business types across each location can be found in Figure 9-1.

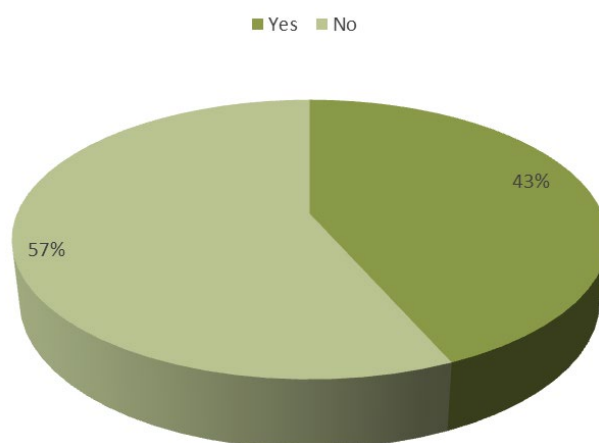
Figure 9-1: Survey locations and business types



Question 1: Were you already aware of the project?

As can be seen in the figure below, just over half of the businesses surveyed (57 per cent) were not previously aware of the project.

Figure 9-2: Previous awareness of project



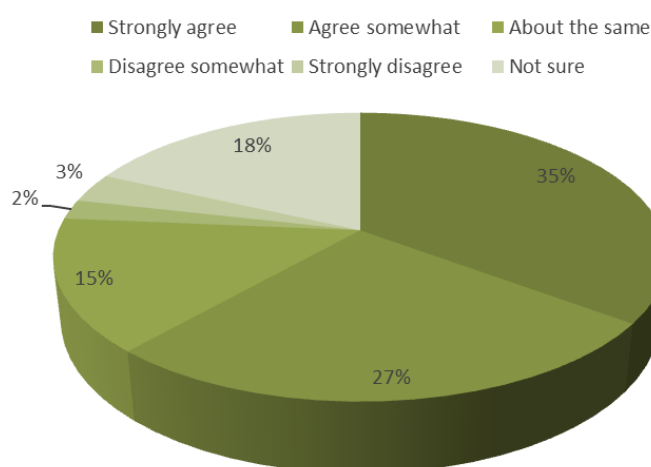
Question 2: Do you agree that once complete, the project would be positive for businesses within the area?

The majority of respondents indicated they thought the project would be positive for businesses in the area, with 35 per cent strongly agreeing and 27 per cent agreeing somewhat. A small minority of respondents thought the project would be negative for businesses in the area with two per cent disagreeing somewhat with the statement and three per cent disagreeing strongly.

Some respondents did not agree or disagree with the statement with 15 per cent stating businesses would remain unchanged by the project and 18 per cent being unsure.

A breakdown can be seen in the figure below.

Figure 9-3: Agreement that project would be positive for businesses in the area

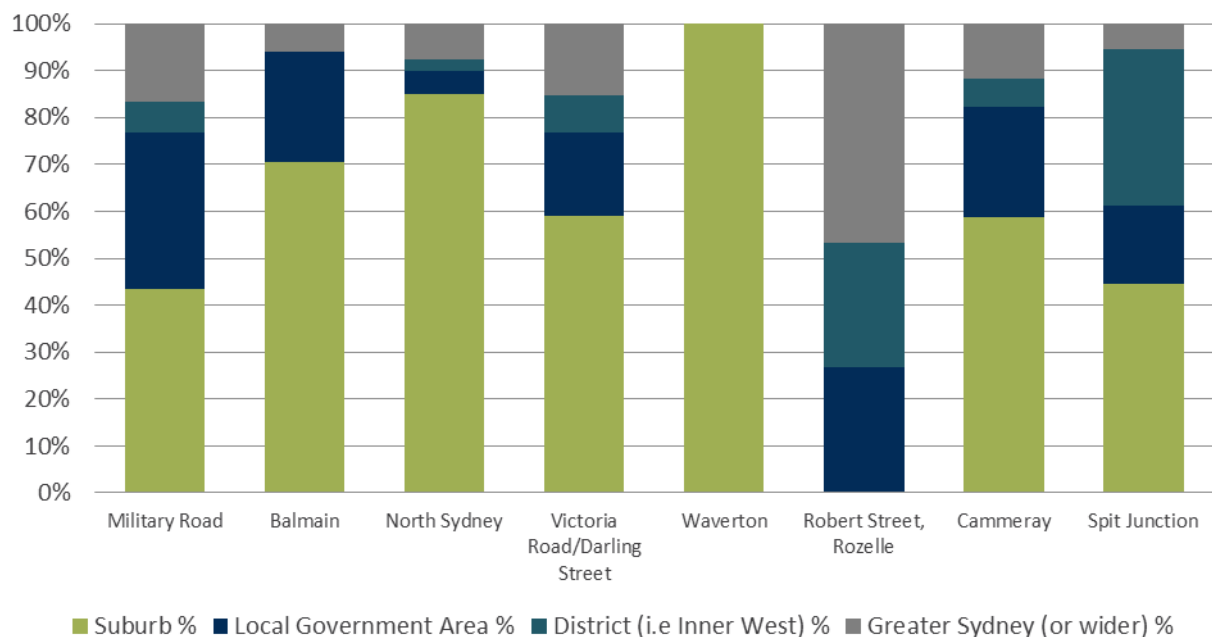


Question 3: Where do the majority of your customers travel from?

This question asked respondents to identify where their customers travelled from (local suburb to Greater Sydney or wider) in order to gauge how far customers travelled to reach the business. The different survey locations provided a variety of responses ranging from businesses in Waverton serving only customers from the local suburb, to Robert Street, Rozelle which served no customers from the local suburb at all. There are many specialised automotive businesses located in the Robert Street area which would typically attract customers from a broader catchment.

A breakdown of where customers travel from for each location can be seen in the figure below.

Figure 9-4: Location of customers



Question 4: Is your business sensitive to any of the following?

Businesses surveyed were asked how sensitive their operations were to a range of factors with the option to indicate a response ranging from 'not at all' to 'majorly'. These are represented in the tables on a scale from 0 (not at all) – 100 (majorly).

The factors businesses were asked to consider were:

- Noise
- Vibration
- Air Quality
- Odours
- Congestion
- Travel Time Delays.

Sensitivity by Location

Sensitivity by business location has been recorded in Table 9-2. Numbers in bold reflect the highest sensitivity for the particular location. When measuring sensitivity from 0 to 100, in most instances business survey responses recorded low to moderate sensitivity. Business locations overall were fairly consistent in their responses with businesses less sensitive to noise and vibration and more sensitive to air quality, odours, congestion and travel time delays. Waverton was the only business location to record major sensitivity to congestion and travel time delays. Balmain and Military Road were the least sensitive locations, where the remainder of locations anticipated moderate sensitivity across most factors.

Table 9-2: Sensitivity by location

| Location | Noise | Vibration | Air Quality | Odours | Congestion | Travel Time Delays |
|--------------------------------------|-------|-----------|-------------|-----------|------------|--------------------|
| Balmain | 14 | 8 | 6 | 2 | 41 | 41 |
| Cammeray | 29 | 37 | 67 | 65 | 65 | 67 |
| Military Road | 32 | 19 | 29 | 6 | 64 | 64 |
| North Sydney | 47 | 49 | 60 | 62 | 56 | 59 |
| Robert Street, Rozelle | 11 | 31 | 62 | 42 | 60 | 73 |
| Spit Junction | 30 | 30 | 56 | 46 | 59 | 69 |
| Victoria Road/Darling Street Rozelle | 44 | 49 | 79 | 78 | 69 | 69 |
| Waverton | 31 | 31 | 31 | 62 | 93 | 93 |
| OVERALL | 34 | 35 | 53 | 47 | 60 | 62 |

Sensitivity by business type

Sensitivity by business type has been recorded in Table 9-3. Numbers in bold reflect the highest sensitivity for the particular business types. When measuring sensitivity from 0 to 100, in most instances business types recorded low to moderate sensitivity. Business types overall were fairly consistent in their responses with businesses less sensitive to noise and vibration and more sensitive to congestion. Construction and manufacturing were the least sensitive business types, whereas accommodation and food services, and personal services were the most sensitive.

Most business types reported moderate sensitivity to congestion, except wholesale trade which reported high levels of sensitivity. Professional services, healthcare and social assistance and personal services were particularly sensitive to travel time delays where all other business types were not sensitive at all or reported moderate sensitivity.

Table 9-3: Sensitivity by business type

| Business type | Noise | Vibration | Air Quality | Odours | Congestion | Travel Time Delays |
|----------------------------------|-------|-----------|-------------|--------|------------|--------------------|
| Accommodation & Food Services | 43 | 42 | 57 | 54 | 53 | 54 |
| Commercial | 25 | 32 | 53 | 39 | 61 | 70 |
| Construction | 0 | 0 | 11 | 0 | 44 | 0 |
| Healthcare and Social Assistance | 37 | 52 | 48 | 33 | 52 | 70 |
| Manufacturing | 0 | 0 | 0 | 0 | 33 | 0 |
| Personal Services | 52 | 52 | 78 | 67 | 74 | 85 |
| Recreational Services/Fitness | 22 | 39 | 39 | 39 | 56 | 0 |
| Retail Trade | 35 | 33 | 55 | 50 | 63 | 61 |
| Wholesale Trade | 0 | 0 | 50 | 50 | 100 | 0 |

Question 5: How dependent is your business on any of the following?

Businesses surveyed were asked how dependent their operations were on a range of factors with the option to indicate a response ranging from 'not at all' to 'majorly'. These are represented in the tables on a scale from 0 (not at all) – 100 (majorly).

The factors businesses were asked to consider were:

- Other businesses in the area
- Recreation and community facilities in the area
- Passing trade (motor vehicles)
- Passing trade (pedestrian and cyclist)
- Pleasant visual amenity
- Convenient customer parking
- Business exposure (visibility)
- Identity and character of business area
- On-street parking
- Loading zones.

Dependency by location

The dependency of a business to factors influencing trade and performance varied across the various business locations. All business locations were the most dependent on passing trade, business exposure (visibility) and on-street parking. There were lower dependencies on nearby recreation and community facilities. Victoria Road/Darling Street at Rozelle was the only anomaly across the locations, recording higher dependencies on recreation and community facilities.

Cammeray and Victoria Road/Darling Street at Rozelle reported the highest dependencies across all factors. Passing trade, convenient customer parking, business exposure, identity and character of business area and on-street parking were all major dependencies for these centres. North Sydney and Robert Street, Rozelle reported higher dependencies on other businesses in the area. Waverton and Balmain were considered to have the least dependencies of the locations, with passing trade the one category that they are more dependent on.

Table 9-4 below identifies the dependencies for each of the locations with the highest dependencies highlighted in bold.

Table 9-4: Dependency by location

| Location | Other businesses in the area | Recreation and community facilities in the area | Passing trade (motor vehicle) | Passing trade (pedestrian and cyclist) | Pleasant visual amenity | Convenient customer parking | Business exposure (visibility) | Identity and character of business area | On-street parking | Loading zones |
|-------------------------------|------------------------------|---|-------------------------------|--|-------------------------|-----------------------------|--------------------------------|---|-------------------|---------------|
| Balmain | 2 | 0 | 71 | 80 | 16 | 25 | 51 | 22 | 47 | 29 |
| Cammeray | 47 | 29 | 65 | 80 | 78 | 82 | 94 | 88 | 84 | 61 |
| Military Road | 26 | 20 | 66 | 72 | 29 | 60 | 76 | 43 | 76 | 31 |
| North Sydney | 62 | 37 | 50 | 83 | 72 | 38 | 87 | 68 | 63 | 48 |
| Robert Street, Rozelle | 62 | 9 | 42 | 36 | 7 | 69 | 51 | 47 | 67 | 64 |
| Spit Junction | 19 | 15 | 50 | 69 | 56 | 94 | 81 | 63 | 93 | 46 |
| Victoria Road/ Darling Street | 44 | 59 | 75 | 91 | 70 | 93 | 93 | 81 | 92 | 48 |
| Waverton | 44 | 33 | 28 | 56 | 44 | 28 | 39 | 44 | 39 | 50 |
| OVERALL | 40 | 30 | 60 | 76 | 52 | 64 | 79 | 61 | 74 | 46 |

Dependency by business type

The dependency of a business to factors influencing trade and performance varied across the various business types. Across the board, business types generally recorded a higher dependency on business exposure (visibility) and on-street parking.

The lowest dependencies were on nearby recreation and community facilities and other businesses in the area.

Manufacturing reported the highest number of dependencies, with major dependencies on convenient customer parking, business exposure, on-street parking and loading zones. Recreation services/fitness businesses also reported high dependencies on customer parking, business exposure and on-street parking. Across the board, retail trade reported higher dependencies on all categories with passing trade, business exposure and on-street parking the most notable factors. Accommodation and food services also reported higher dependencies across all categories particularly around passing trade, pleasant environment, business exposure, identity and character of the area. Construction and wholesale trade were the least dependent on other factors.

Table 9-5 below identifies the dependencies for each of the business types with the highest dependencies highlighted in bold.

Table 9-5: Dependency by business type

| Business type | Other businesses in the area | Recreation and community facilities in the area | Passing trade (motor vehicle) | Passing trade (pedestrian and cyclist) | Pleasant visual amenity | Convenient customer parking | Business exposure (visibility) | Identity and character of business area | On-street parking | Loading zones |
|----------------------------------|------------------------------|---|-------------------------------|--|-------------------------|-----------------------------|--------------------------------|---|-------------------|---------------|
| Accommodation and Food Services | 50 | 38 | 66 | 95 | 68 | 52 | 82 | 72 | 64 | 43 |
| Commercial | 38 | 12 | 46 | 52 | 43 | 71 | 70 | 57 | 78 | 36 |
| Construction | 0 | 0 | 67 | 67 | 0 | 11 | 67 | 11 | 67 | 22 |
| Healthcare and Social Assistance | 22 | 19 | 41 | 52 | 33 | 52 | 59 | 44 | 74 | 26 |
| Manufacturing | 67 | 0 | 67 | 33 | 56 | 100 | 89 | 56 | 100 | 100 |
| Personal Services | 33 | 56 | 44 | 67 | 63 | 81 | 81 | 59 | 78 | 19 |
| Recreational Services/Fitness | 28 | 44 | 50 | 61 | 28 | 83 | 94 | 72 | 100 | 22 |
| Retail Trade | 41 | 33 | 68 | 84 | 53 | 68 | 83 | 62 | 75 | 57 |
| Wholesale | 33 | 33 | 17 | 0 | 0 | 33 | 17 | 50 | 50 | 50 |

Question 6: During the construction phase, what effect would the project have on the following?

Businesses surveyed were asked to indicate how they believed certain aspects of their businesses would be affected during the construction phase of the project.

The aspects businesses were asked to consider were:

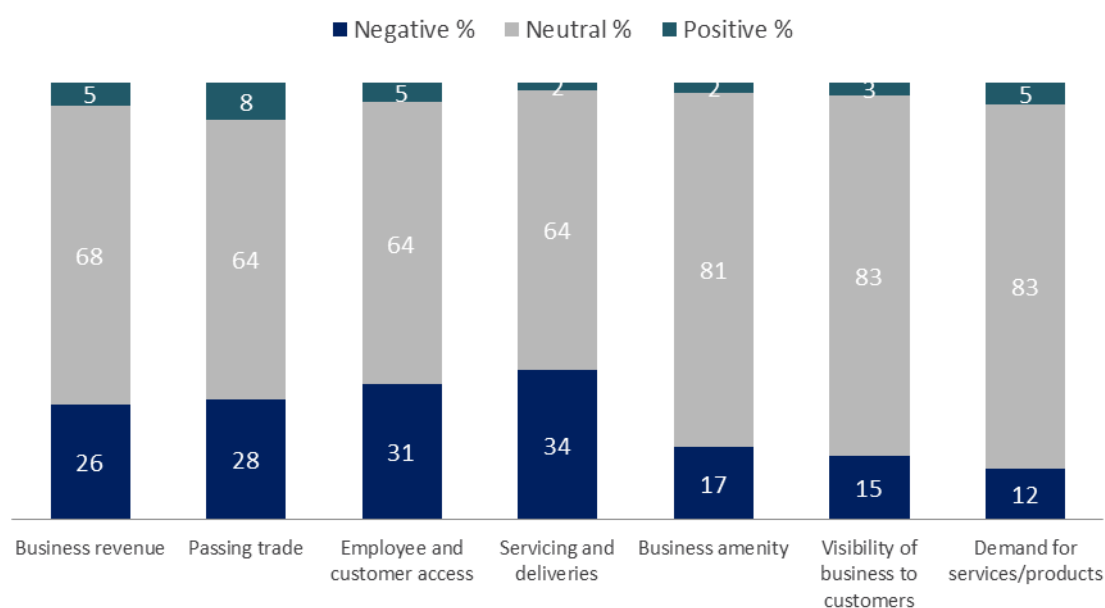
- Business revenue
- Passing trade
- Employee and customer access
- Servicing and deliveries
- Business amenity
- Visibility of business to customers
- Demand for services/products.

The majority of businesses predicted there would be neither a positive nor negative impact on their business during the construction phase. There were instances where businesses thought that construction would negatively affect operations. Servicing, deliveries and access for employees and customers were anticipated to be most affected by construction.

There were limited perceived positive aspects of construction with passing trade viewed as the greatest benefit.

A breakdown of responses to question six can be seen in Figures B-5 to B-12.

Figure 9-5: Perceived construction effects on business elements across all locations

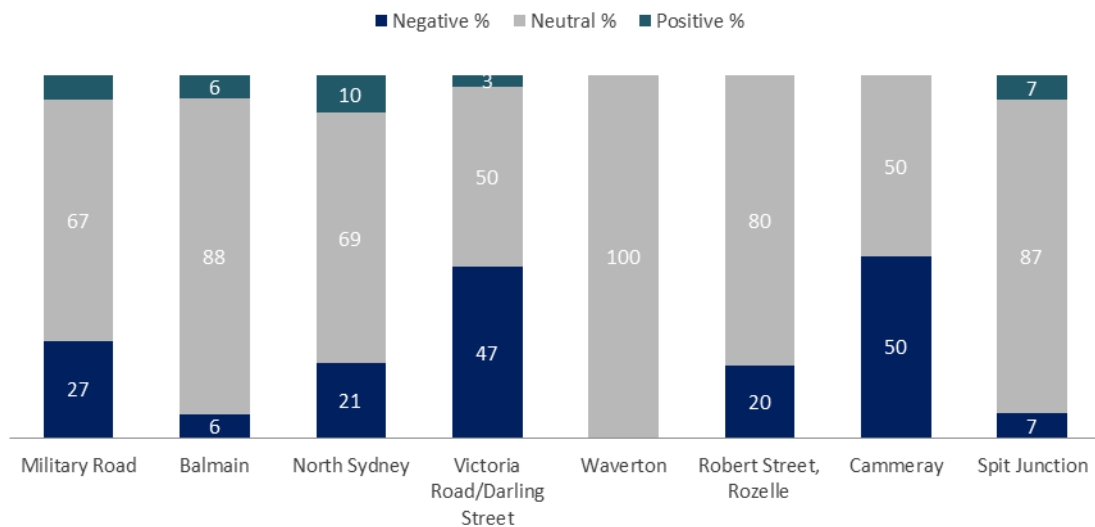


Notwithstanding, when each issue is viewed in isolation, some trends do appear.

Business revenue

Although most responses were neutral, businesses in Victoria Road/Darling Street, Rozelle and Cammeray responded differently to other locations to the issue of business revenue. Half or just under half of all businesses believed they would be affected negatively during construction.

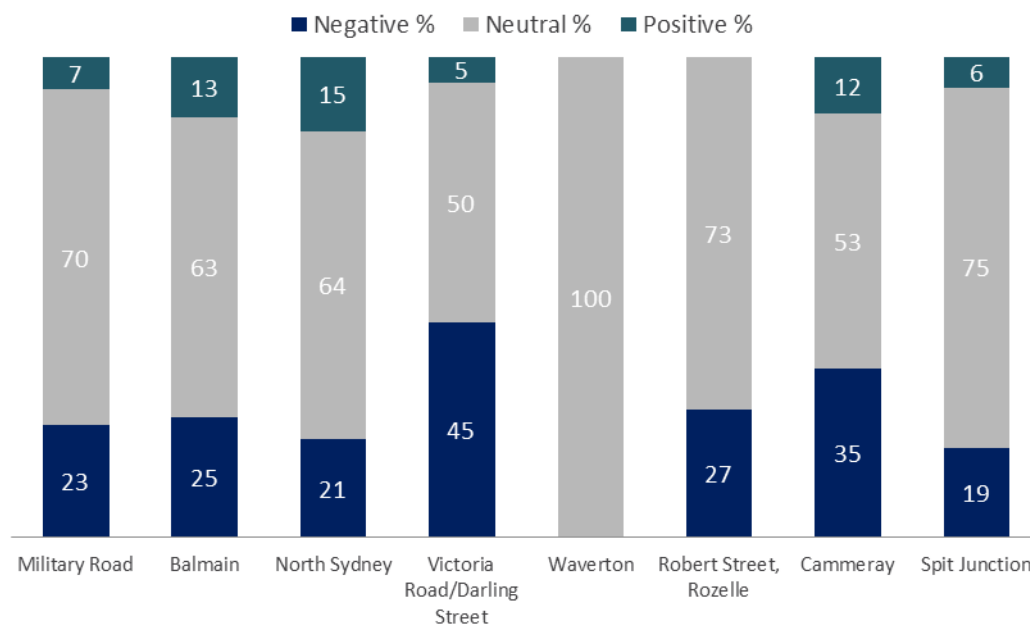
Figure 9-6: Anticipated construction effect on business revenue by location



Passing trade

The majority of responses were neutral. Almost half of all businesses located on Victoria Road/Darling Street (45 per cent) responded that passing trade would be affected negatively during construction. This question also elicited more positive responses than any other category. Many businesses believed their business would benefit from an increase in trade from tradespeople employed on the project.

Figure 9-7: Anticipated construction effect on passing trade across locations

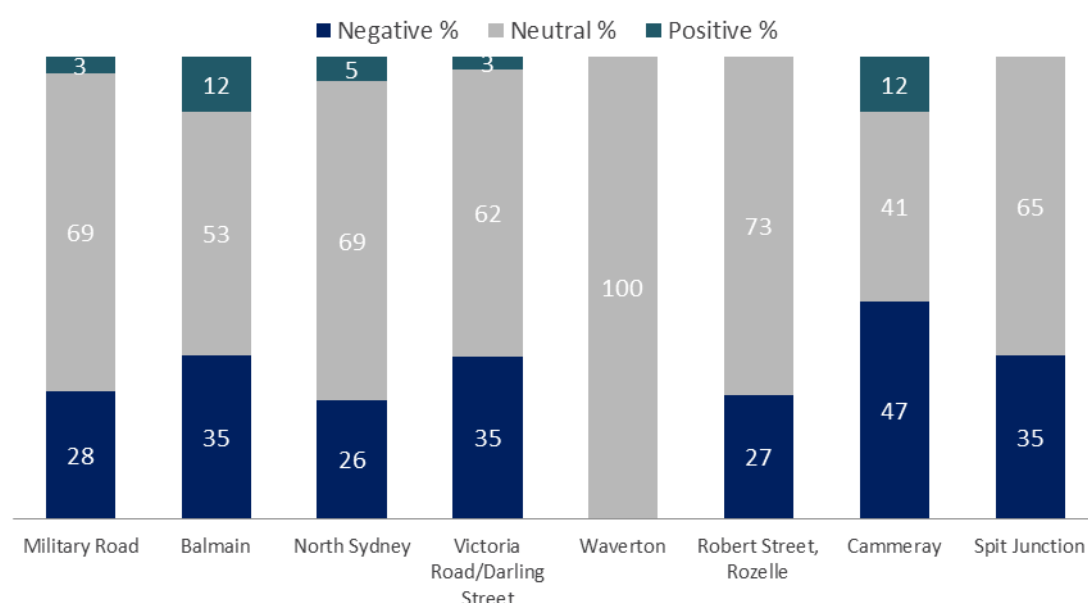


Employee and customer access

Although the majority of responses were neutral, businesses in all locations indicated notable negative responses to this question with the exception of Waverton, which returned a 100 per cent neutral response. Between 26 and 47 per cent of businesses in the remaining locations indicated

employee and customer access would be affected negatively during construction. Many businesses mentioned worries that traffic congestion would increase.

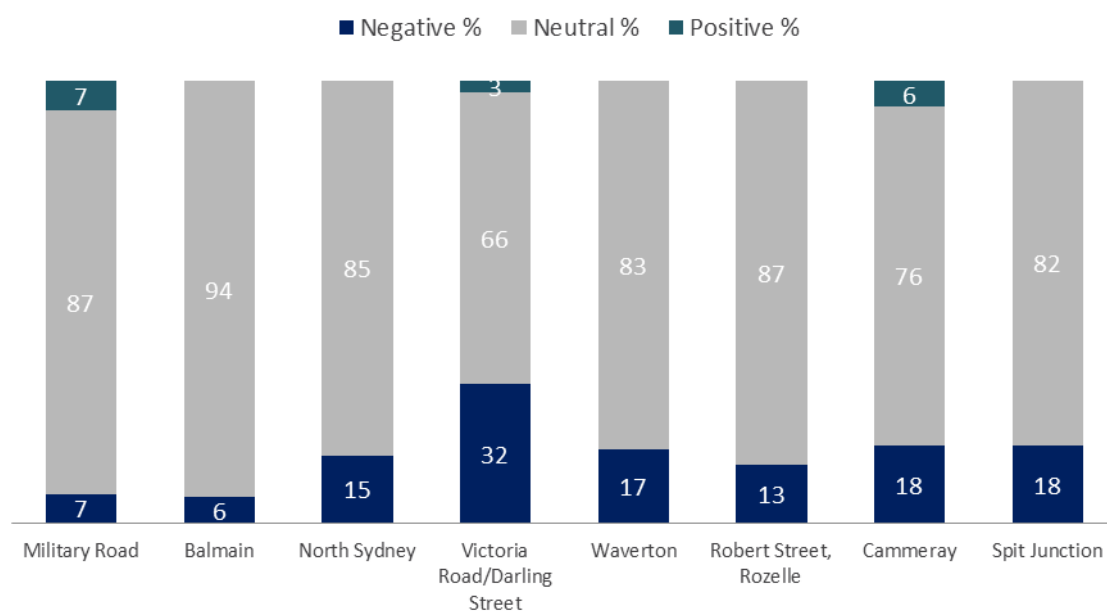
Figure 9-8: Anticipated construction effect on employee and customer access across locations



Business amenity

Although the majority of responses were neutral, some level of responses in all locations was negative. Businesses which were located far from proposed construction support sites commented that altered traffic conditions could affect the amenity of their business.

Figure 9-9: Perceived construction effect on business amenity across locations

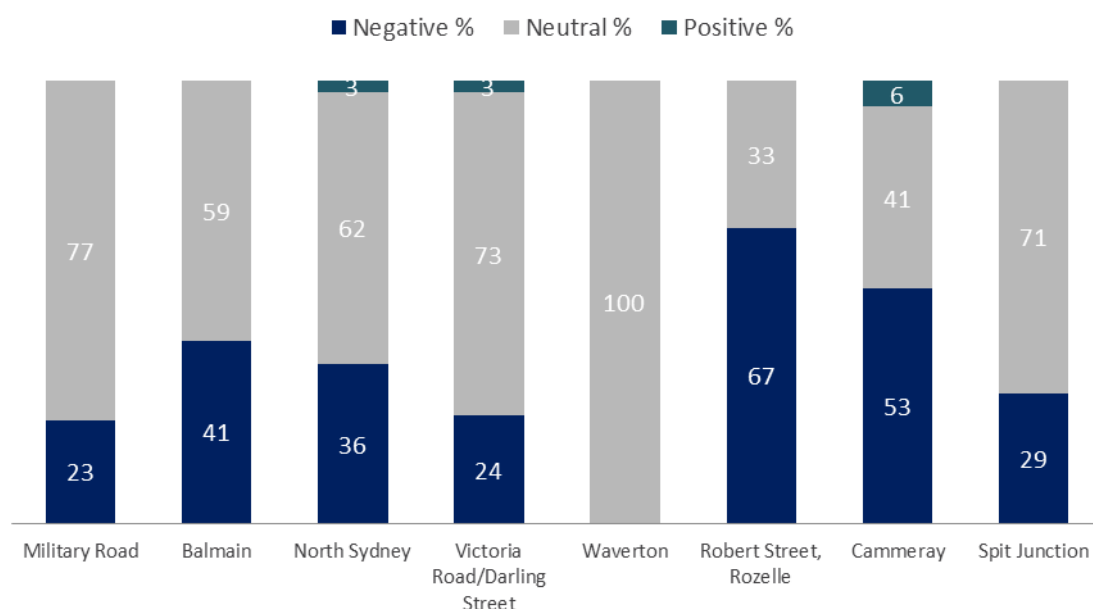


Servicing and deliveries

This issue was the subject of the most negative responses, although the majority of answers were again neutral. This is most likely as a result of a perceived increase in traffic congestion affecting servicing and deliveries. Most notably, the majority of businesses in Robert Street at Rozelle indicated

that servicing and deliveries would be affected negatively. This is likely due to the higher level of wholesale and manufacturing businesses located there.

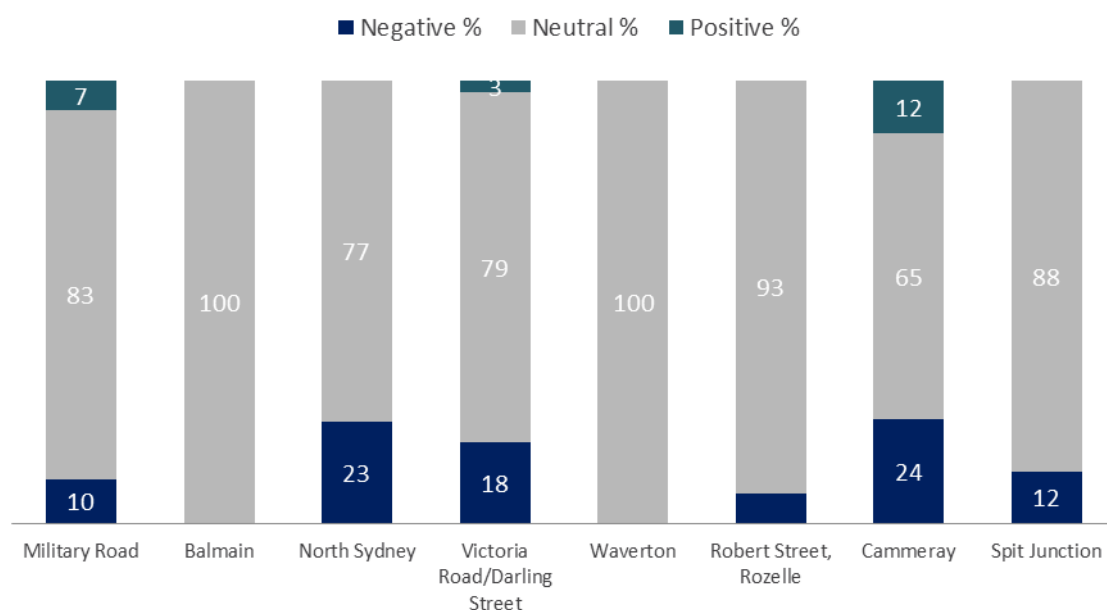
Figure 9-10: Anticipated construction effect on servicing and deliveries across locations



Visibility of business to customers

Although the majority of responses were neutral, businesses in many locations did not state that the visibility of their business would be negatively affected during construction, as most construction work would take place underground on tunnelling works. North Sydney, Victoria Road/Darling Street and Cammeray gave notable negative responses to this question. Some businesses at Cammeray, Military Road and Victoria Road/Darling Street suggested visibility could improve.

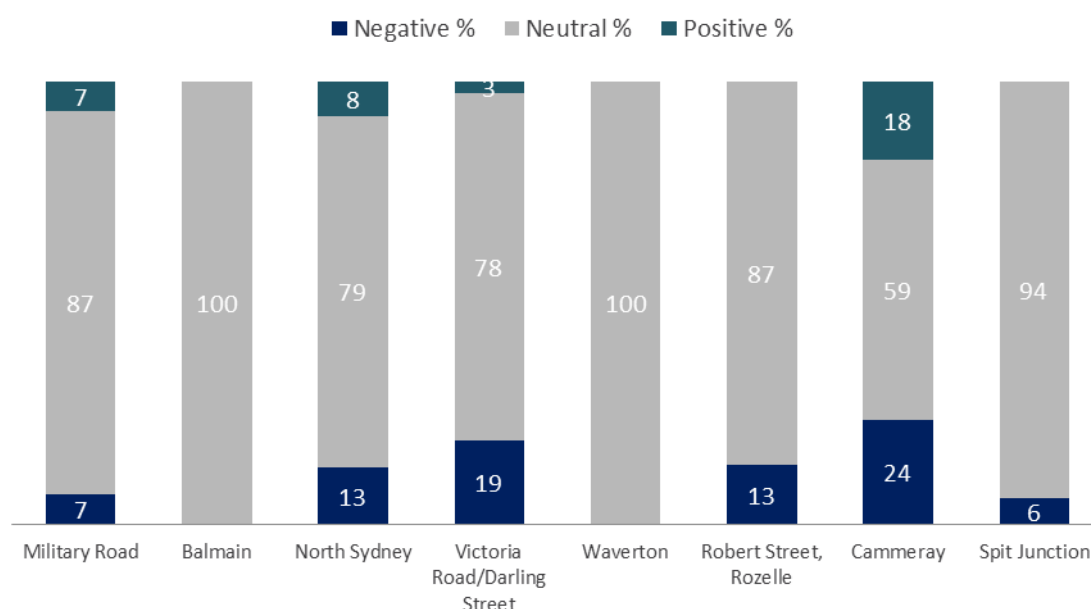
Figure 9-11: Anticipated construction effect on business visibility across locations



Demand for services/products

There were mixed views on this topic with some notable positive and negative responses. Some businesses commented that they would suffer from customers avoiding the area due to these construction support sites while others stated they would benefit from increased trade from construction workers in the area. Overall the responses were predominantly neutral.

Figure 9-12: Anticipated construction effect on demand for services/products across locations



Question 7: During the operation phase, what effect would the project have on the following?

Businesses surveyed were asked to indicate how they believed certain aspects of their businesses would be affected during the operation phase of the project.

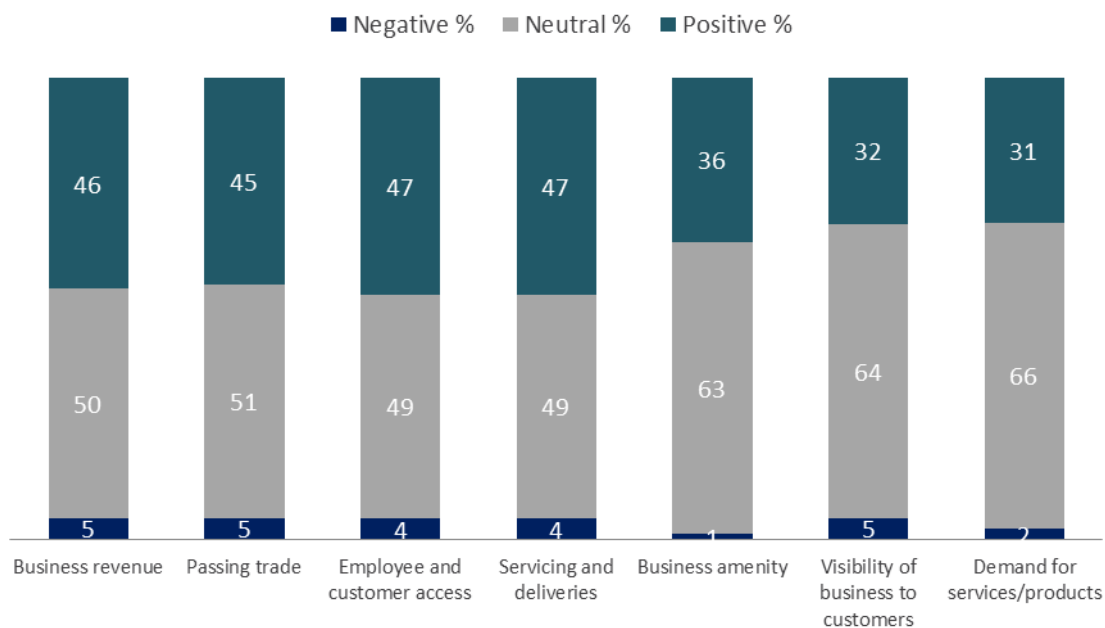
The elements businesses were asked to consider were:

- Business revenue
- Passing trade
- Employee and customer access
- Servicing and deliveries
- Business amenity
- Visibility of business to customers
- Demand for services/products.

All locations indicated a prediction that businesses would experience either neutral or positive effects from the project, once in operation. Very few businesses indicated a perceived negative impact of the project during the operation phase.

A breakdown of responses to question seven can be seen in Figures B-13 to B-20.

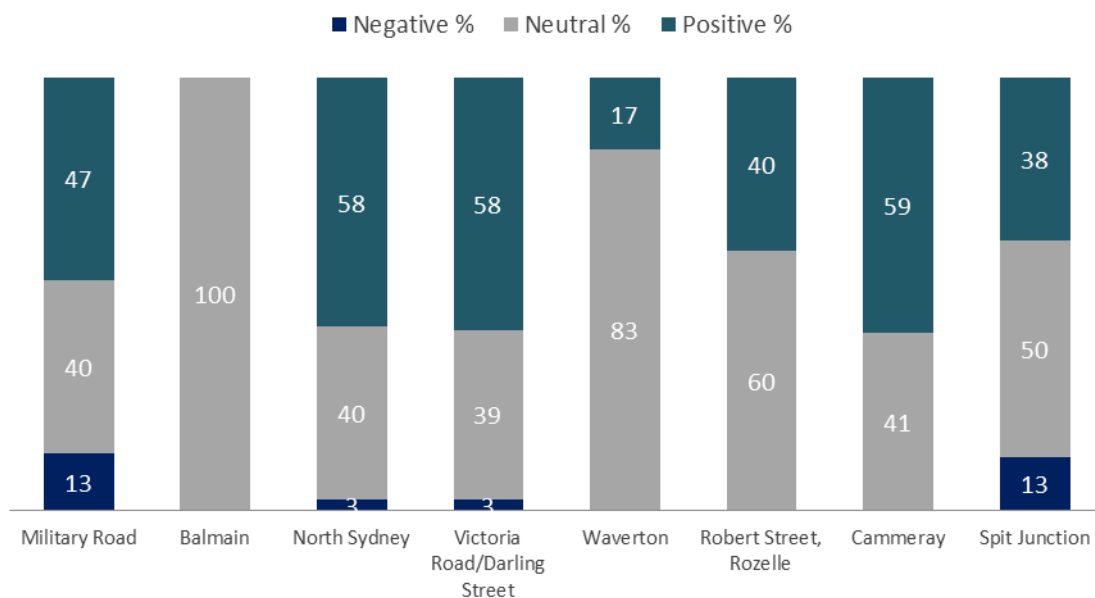
Figure 9-13: Anticipated operation effect on business elements across all locations



Business revenue

A large number of businesses located in Military Road, North Sydney, Victoria Road/Darling Street, Robert Street, Rozelle, Cammeray and Spit Junction answered that the project would be positive for business revenue. All businesses in Balmain responded neutrally.

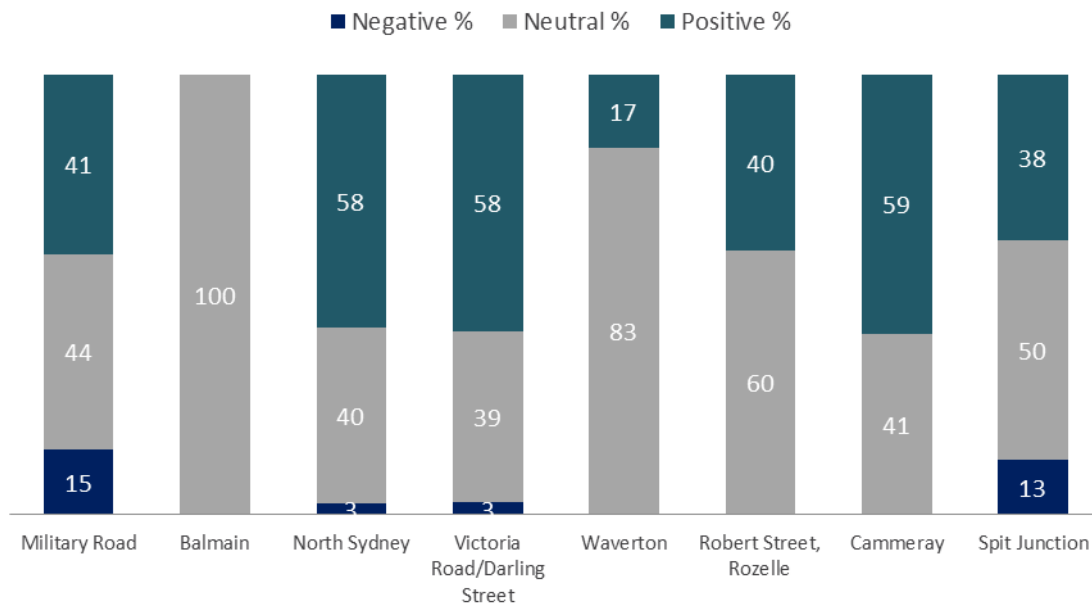
Figure 9-14: Anticipated operation effect on business revenue by location



Passing trade

A large number of businesses located in Military Road, North Sydney, Victoria Road/Darling Street, Robert Street, Rozelle, Cammeray and Spit Junction answered that the project would be positive for passing trade. All businesses in Balmain responded neutrally.

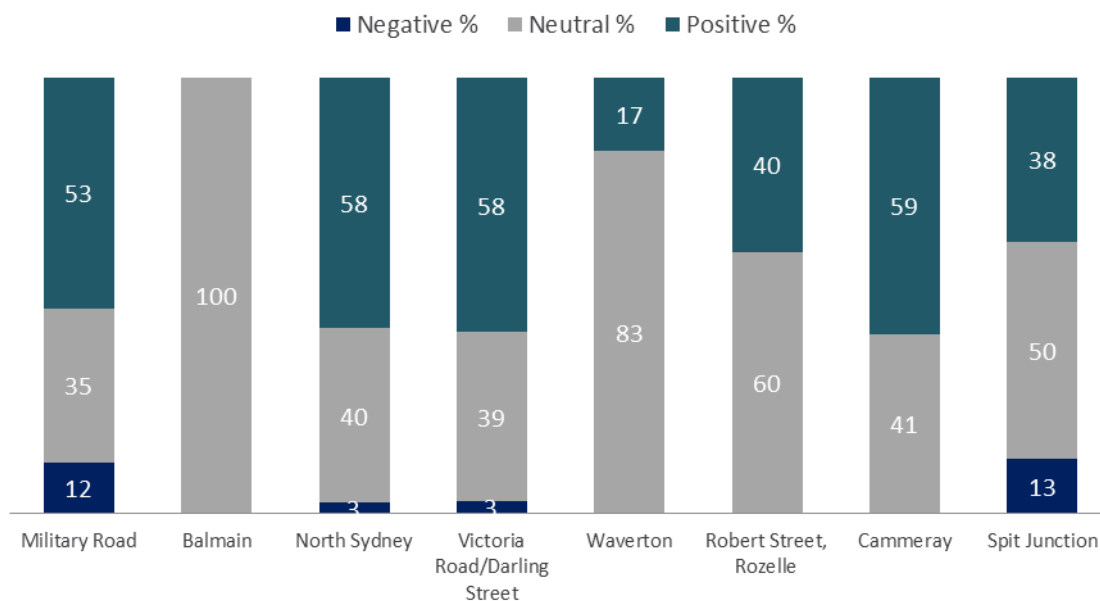
Figure 9-15: Anticipated operation effect on passing trade by location



Employee and customer access

Many businesses located in Military Road, North Sydney, Victoria Road/Darling Street, Robert Street, Rozelle, Cammeray and Spit Junction answered that the project would improve employee and customer access. All businesses in Balmain responded neutrally.

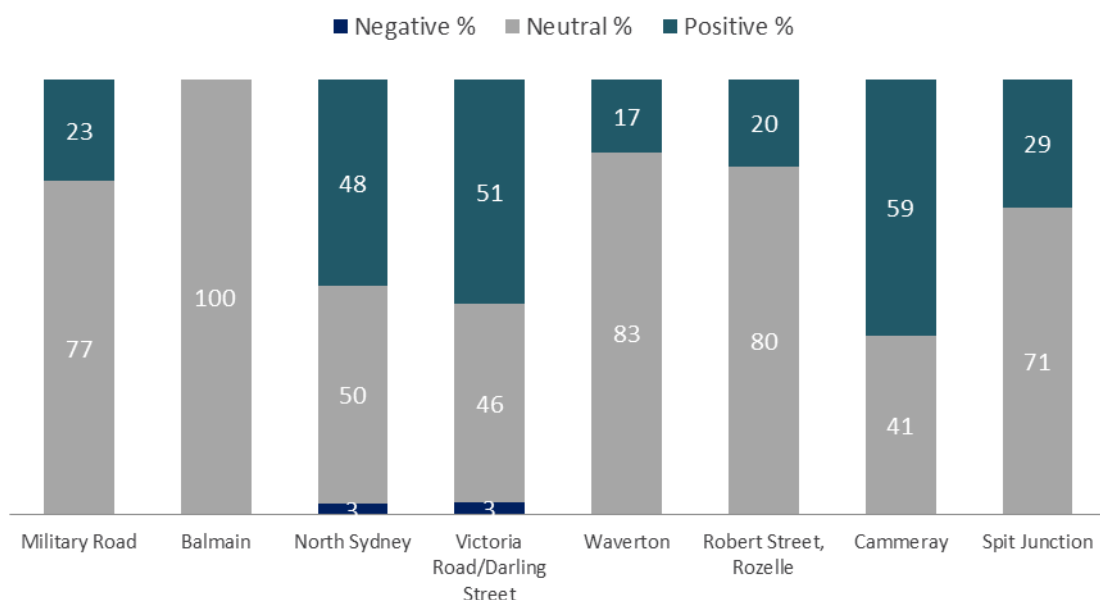
Figure 9-16: Anticipated operation effect on employee and customer access by location



Business amenity

A notable number of businesses located in Military Road, North Sydney, Victoria Road/Darling Street, Robert Street, Rozelle, Cammeray and Spit Junction answered that the project would be positive for business amenity. Very few businesses across all survey locations responded negatively with three per cent in North Sydney and Victoria Road/Darling Street respectively thinking business amenity would be affected negatively.

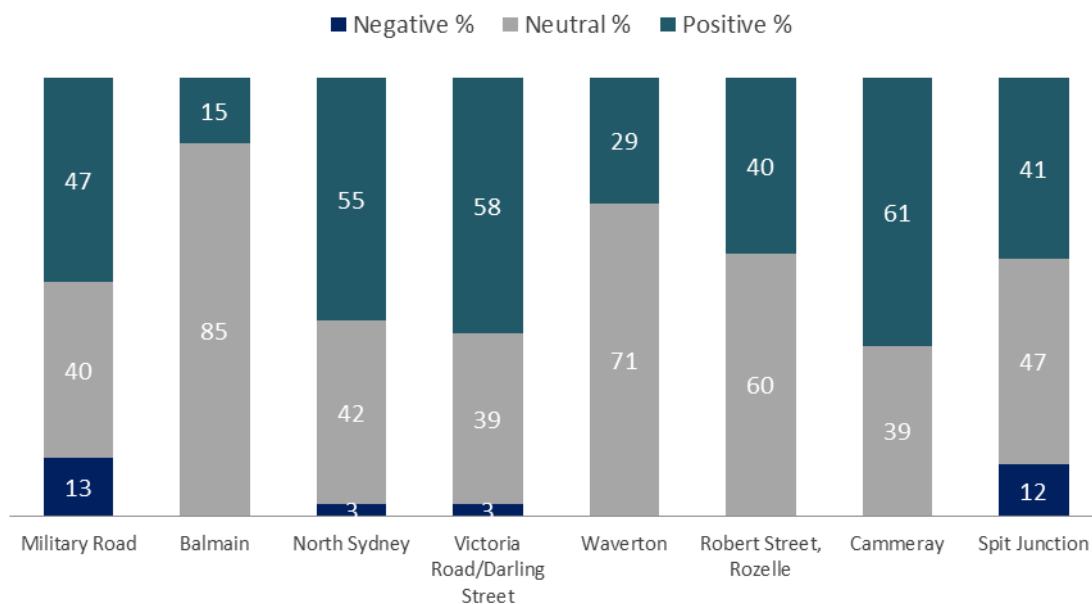
Figure 9-17: Anticipated operation effect on business amenity by location



Servicing and deliveries

A degree of businesses in all locations stated that servicing and deliveries would be affected positively by the project. Many stated that this was due to improved traffic flow when the project is in operation meaning deliveries and services requiring roads would be more reliable.

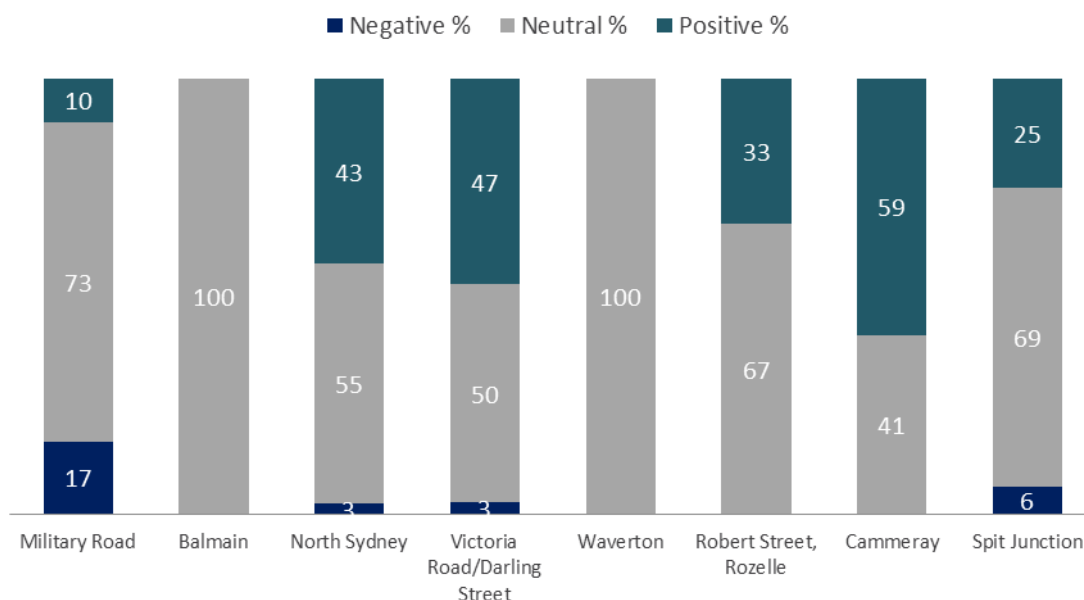
Figure 9-18: Anticipated operation effect on servicing and deliveries by location



Visibility of business to customers

A large number of businesses located in North Sydney, Victoria Road/Darling Street, Robert Street, Rozelle, Cammeray and Spit Junction answered that the project would positively impact the visibility of the business to customers. Many comments from businesses mentioned less traffic meaning travel times and availability of parking would be improved. Businesses in these areas also indicated high levels of sensitivity to congestion and travel time delays.

Figure 9-19: Anticipated operational effect on business visibility to customers by location

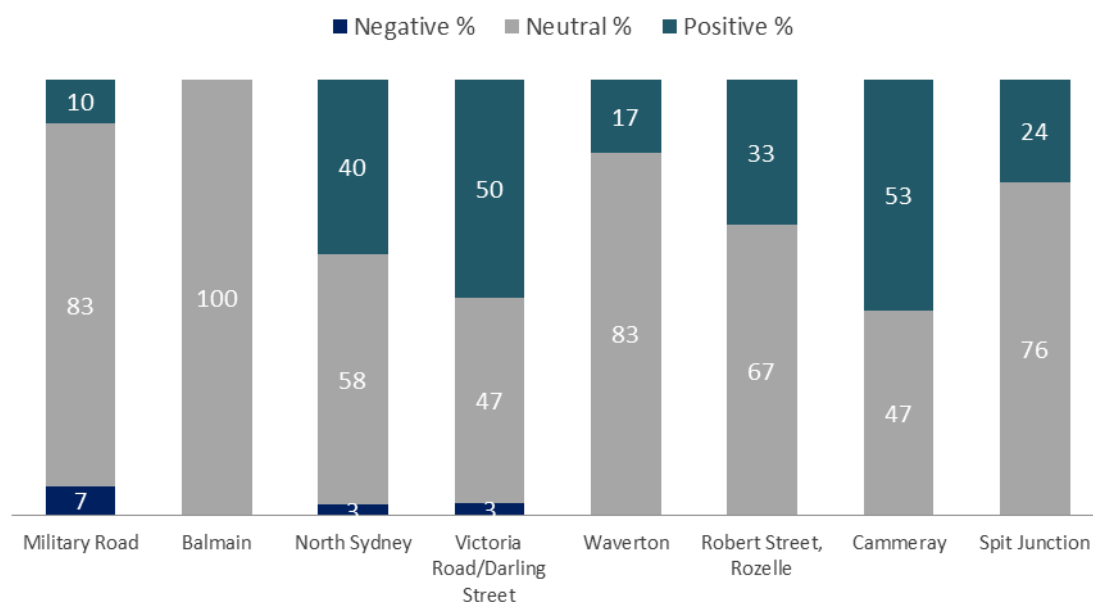


Demand for services/products

A large number of businesses located in North Sydney, Victoria Road/Darling Street, Robert Street, Rozelle, Cammeray and Spit Junction answered that the project would positively impact demand for products and services. These locations are on major thoroughfares and rely on customers that travel

from outside the local area. Many businesses stated that customers would be more likely to visit the store if travel times and congestion were reduced.

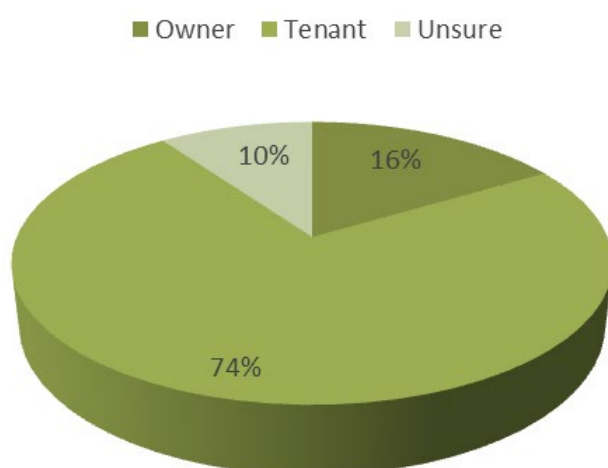
Figure 9-20: Anticipated operational effect on demand for services/products by location



Question 8: Are you an owner-occupier or tenant?

As can be seen in the figure below, 74 per cent of the businesses surveyed, leased their premises while 16 per cent were owner-occupiers. Ten per cent of respondents were unsure whether the business owned the premises or leased.

Figure 9-21: Owning or leasing premises

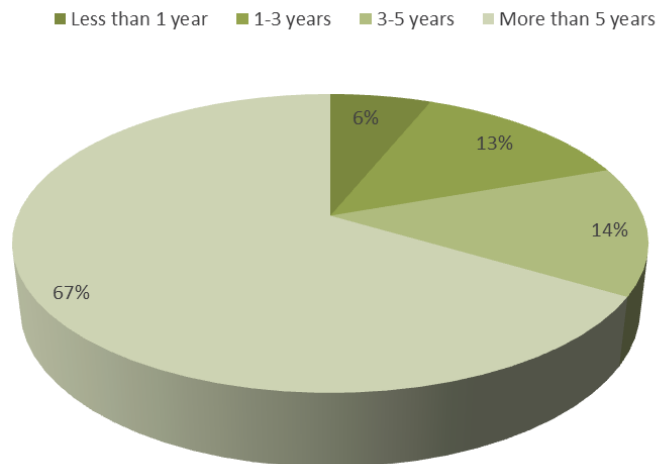


Question 9: How long have you been operating in the area?

From the businesses surveyed, 67 per cent have been in operation for more than five years, 14 per cent between three and five years, and six per cent between one and three years. Finally, six per cent of businesses had been in operation for less than a year.

A breakdown can be seen in the figure below.

Figure 9-22: Years in operation

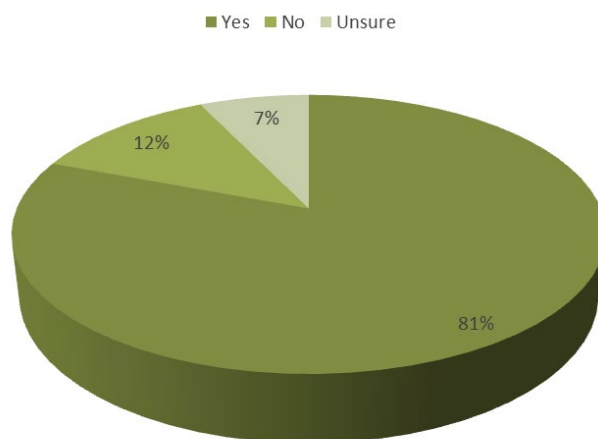


Question 10: Do you plan to be here in five years?

The vast majority of businesses surveyed (81 per cent) planned to be at the same premises in five years' time. Of the remainder of businesses surveyed, 12 per cent did not intend to be at the same premises in five years and seven per cent were unsure.

A breakdown can be seen in the figure below.

Figure 9-23: Intention to stay in same location

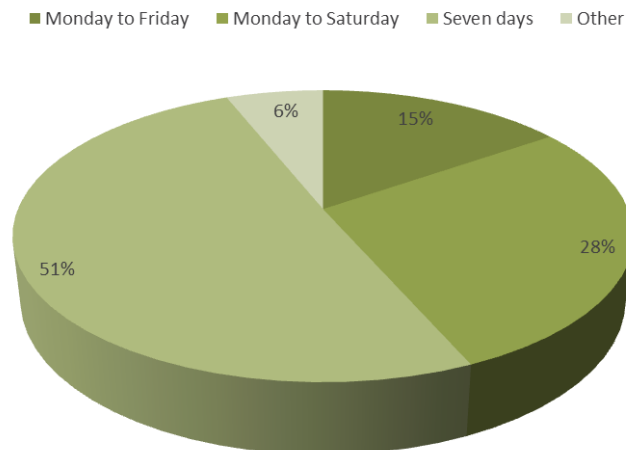


Question 11: What are your main trading days?

Just over half of the businesses surveyed (51 per cent) were open seven days a week followed by 28 per cent of businesses being open six days a week from Monday to Saturday. Businesses which operated Monday to Friday made up 15 per cent of those surveyed and six per cent responded with other operating days. The majority of businesses which responded with 'other' were restaurants and bars which were open Tuesday to Saturday or Tuesday to Sunday.

A breakdown of trading days can be seen in the figure below.

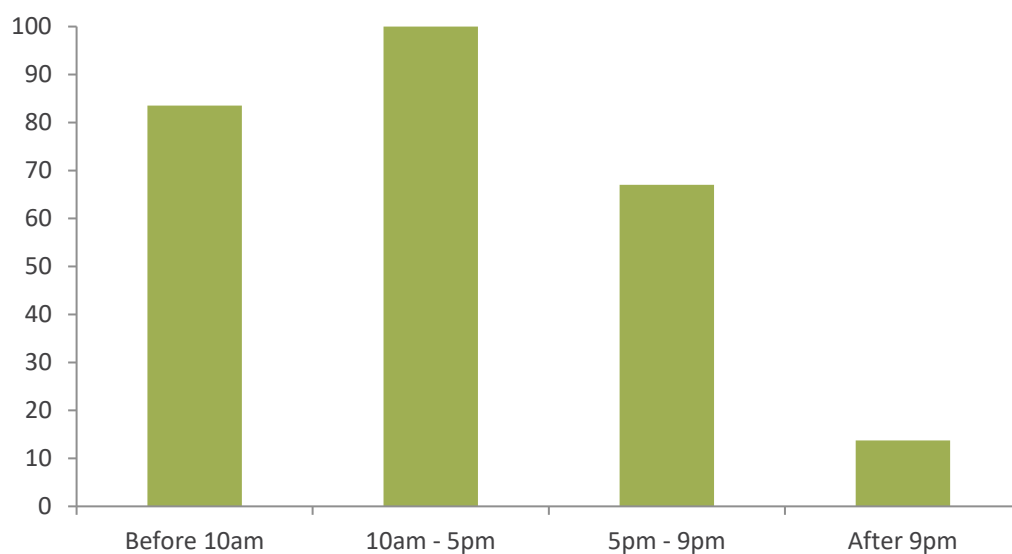
Figure 9-24: Main trading days



Question 12: When are you open?

As can be seen in the figure below, 84 per cent of the businesses surveyed were open before 10.00am and all reported being open between 10.00am-5.00pm. The number of businesses open dropped in the evening with 67 per cent open between 5.00pm and 9.00pm and 14 per cent open after 9.00pm.

Figure 9-25: Hours of operation

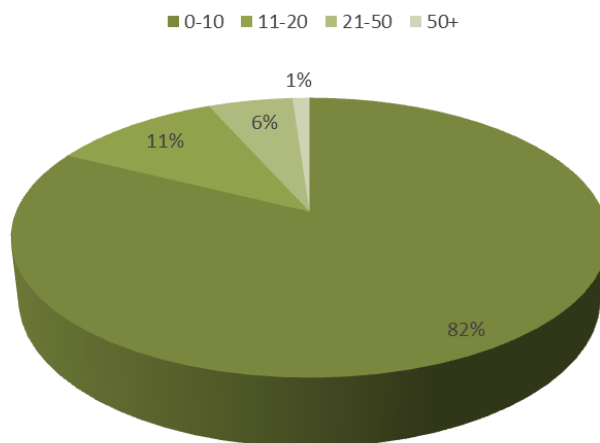


Question 13: Number of staff?

The vast majority of businesses (82 per cent) employed ten members of staff or less with 11 per cent employing between 11 and 20. Making up a small number of businesses surveyed were businesses employing between 21 and 50 members of staff (six per cent) and one per cent employing more than 50.

A breakdown of staff numbers can be seen in the figure below.

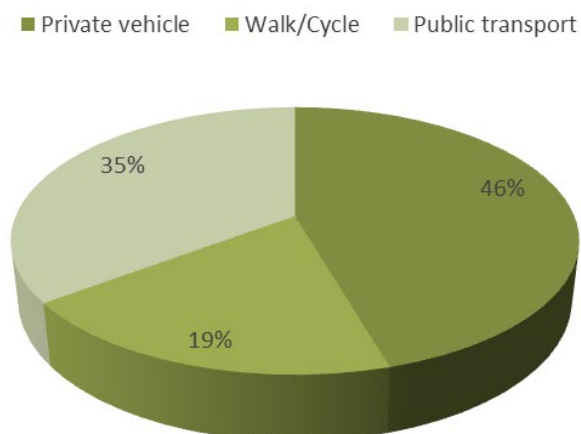
Figure 9-26: Number of staff employed



Question 14: How do your staff usually travel to your business?

As can be seen in the figure below, the most popular method of transport for staff commuting to and from work was by private vehicle at 46 per cent followed by public transport at 35 per cent. The least common method of transportation was walking and cycling at 19 per cent.

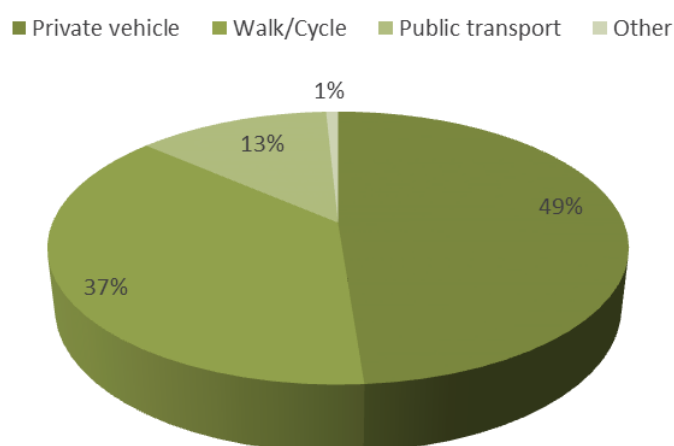
Figure 9-27: Employee travel to work method



Question 15: How do your clients/customers usually travel to your business?

As can be seen in the figure below, just under half of all businesses (49 per cent), reported that most of their customers travelled to the business by private vehicle. This was followed by walking and cycling at 37 per cent and public transport at 13 per cent.

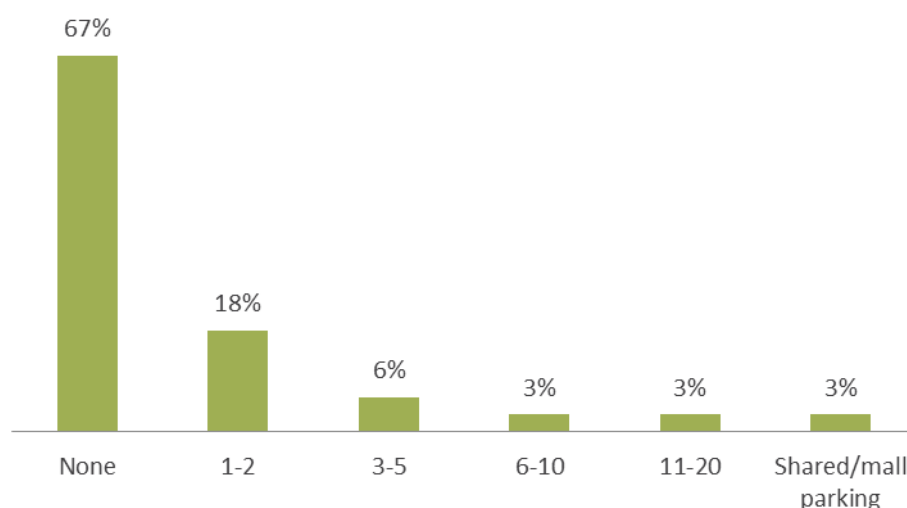
Figure 9-28: Client/customer travel method



Question 16: Do you have parking? If so, how many spaces?

As can be seen in the figure below, the majority of businesses surveyed (67 per cent) do not have any parking. This was followed by businesses which have one or two spaces at 18 per cent, with six per cent having between three and five spaces. Businesses which have between six and ten spaces made up three per cent of respondents, as did businesses which had between 11 and 20 spaces and those which make use of a large, shared parking area such as in a shopping mall.

Figure 9-29: Parking configuration

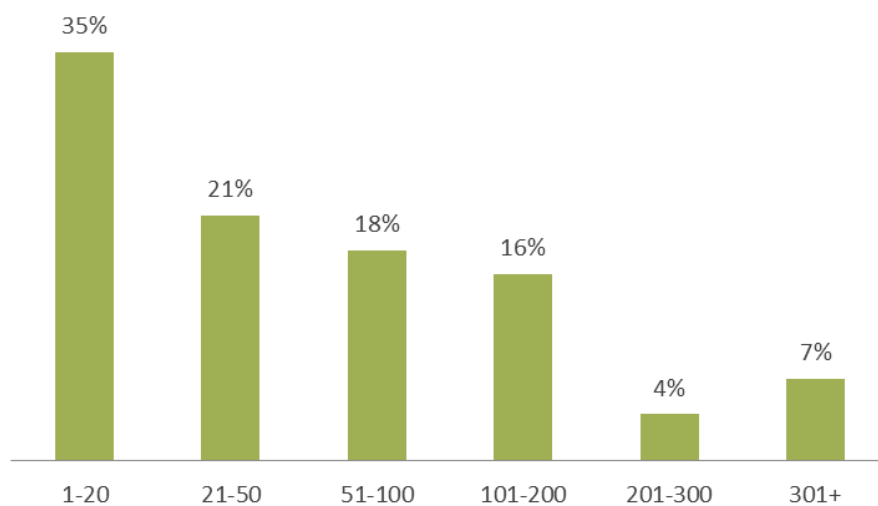


Question 17: Approximate number of customers per day?

Of the businesses surveyed 35 per cent have between one and twenty customers per day and 21 per cent have between 21 and 50 customers per day. These businesses made up the majority of responses, followed by businesses which have between 51 and 100 customers per day at 17 per cent and those with between 101 and 200 customers per day at 16 per cent. A small minority of businesses have large numbers of customers per day, with four per cent of businesses having between 201 and 300 and seven per cent having 301 customers per day or more.

A breakdown of customer numbers can be found in the figure below.

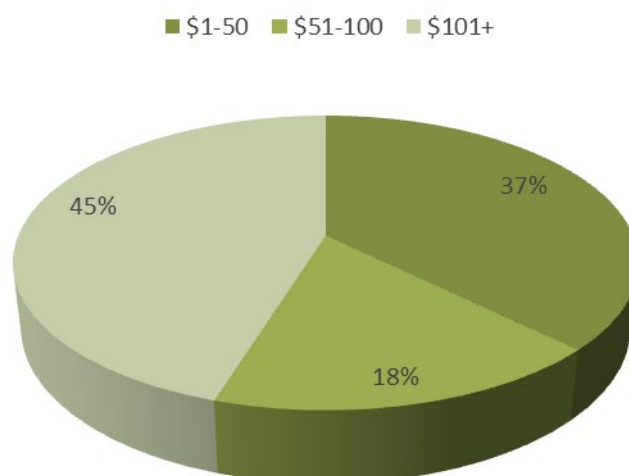
Figure 9-30: Number of customers per day



Question 18: Average dollar spend per customer?

As can be seen in the figure below, 45 per cent of the businesses surveyed, indicated that on average, their customers spend more than 101 dollars. The second largest category was businesses whose customers spend between one and 50 dollars at 37 per cent. Businesses whose customers spend between 51 and 100 dollars made up 18 per cent of those surveyed.

Figure 9-31: Average dollar spend





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Appendix B. Demographic information

Table B-1 Population growth, 2006 to 2016

| Locality | 2006 | 2011 | 2016 | Population change (average annual growth) (%) | |
|---------------------------|-----------|-----------|-----------|---|-----------|
| | | | | 2011-2016 | 2006-2016 |
| Balmain | 14,888 | 15,743 | 16,650 | 1.1 | 1.1 |
| Leichhardt-Annandale | 23,588 | 25,992 | 27,957 | 1.5 | 1.7 |
| Lilyfield-Rozelle | 12,767 | 13,907 | 14,933 | 1.4 | 1.6 |
| South Harbour Precinct | 51,243 | 55,642 | 59,540 | 1.4 | 1.5 |
| Cremorne-Cammeray | 17,815 | 19,283 | 20,281 | 1.0 | 1.3 |
| Crows Nest-Waverton | 16,494 | 17,754 | 19,125 | 1.5 | 1.5 |
| Mosman | 27,570 | 29,351 | 30,215 | 0.6 | 0.9 |
| Neutral Bay-Kirribilli | 16,977 | 17,996 | 19,052 | 1.1 | 1.2 |
| North Sydney-Lavender Bay | 9050 | 10,249 | 11,479 | 2.3 | 2.4 |
| St Leonards-Naremburn | 8849 | 9807 | 11,065 | 2.4 | 2.3 |
| North Harbour Precinct | 96,755 | 104,440 | 111,217 | 1.3 | 1.4 |
| Study area | 147,998 | 160,082 | 170,757 | 1.3 | 1.4 |
| Greater Sydney | 4,256,161 | 4,608,949 | 5,029,768 | 1.8 | 1.7 |

Source: Based on 2016 ABS Regional Population Growth, Australia. Cat. 3218.0.

Table B-2 Age profile, 2016

| Locality | 0-14 years (%) | 15-24 years (%) | 25-44 years (%) | 45-64 years (%) | + 65 years (%) |
|---------------------------|----------------|-----------------|-----------------|-----------------|----------------|
| Balmain | 17.4 | 7.6 | 31.8 | 28.9 | 14.2 |
| Leichhardt-Annandale | 18.8 | 9.6 | 36.3 | 24.1 | 11.3 |
| Lilyfield-Rozelle | 18.4 | 7.6 | 36.2 | 26.7 | 11.2 |
| South Harbour Precinct | 18.3 | 8.5 | 35.0 | 26.1 | 12.1 |
| Cremorne-Cammeray | 16.0 | 7.2 | 36.5 | 24.6 | 15.8 |
| Crows Nest-Waverton | 13.0 | 7.7 | 45.3 | 21.8 | 12.3 |
| Mosman | 17.6 | 10.0 | 26.3 | 26.9 | 19.1 |
| Neutral Bay-Kirribilli | 10.8 | 7.6 | 43.1 | 22.1 | 16.5 |
| North Sydney-Lavender Bay | 9.9 | 9.2 | 42.9 | 23.8 | 14.1 |
| St Leonards-Naremburn | 15.2 | 8.0 | 47.2 | 20.3 | 9.3 |
| North Harbour Precinct | 14.3 | 8.4 | 38.1 | 23.8 | 15.4 |
| Study area | 15.7 | 8.4 | 37.0 | 24.6 | 14.2 |
| Greater Sydney | 18.7 | 13.0 | 30.5 | 23.9 | 13.9 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-3 Cultural diversity, 2016

| Locality | Indigenous (%) | Born overseas (%) | Speaks a language other than English (%) |
|---------------------------|----------------|-------------------|--|
| Balmain | 0.7 | 28.8 | 11.3 |
| Leichhardt-Annandale | 1.2 | 27.2 | 17.7 |
| Lilyfield-Rozelle | 1.0 | 28.5 | 15.4 |
| South Harbour Precinct | 1.0 | 28.0 | 15.3 |
| Cremorne-Cammeray | 0.2 | 34.7 | 18.1 |
| Crows Nest-Waverton | 0.3 | 38.0 | 23.8 |
| Mosman | 0.2 | 33.4 | 15.1 |
| Neutral Bay-Kirribilli | 0.3 | 36.6 | 20.1 |
| North Sydney-Lavender Bay | 0.4 | 42.7 | 26.7 |
| St Leonards-Naremburn | 0.2 | 44.7 | 33.9 |
| North Harbour Precinct | 0.3 | 37.1 | 21.1 |
| Study area | 0.5 | 33.9 | 19.1 |
| Greater Sydney | 1.5 | 36.8 | 35.8 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-4 English proficiency, 2016

| Locality | Speaks English only (%) | Speaks English not well or not at all (%) |
|---------------------------|-------------------------|---|
| Balmain | 80.3 | 1.2 |
| Leichhardt-Annandale | 75.1 | 2.2 |
| Lilyfield-Rozelle | 77.2 | 2.0 |
| South Harbour Precinct | 77.1 | 1.9 |
| Cremorne-Cammeray | 75.4 | 1.8 |
| Crows Nest-Waverton | 69.8 | 2.6 |
| Mosman | 77.9 | 1.4 |
| Neutral Bay-Kirribilli | 71.2 | 1.9 |
| North Sydney-Lavender Bay | 63.8 | 2.6 |
| St Leonards-Naremburn | 59.3 | 4.4 |
| North Harbour Precinct | 71.6 | 2.2 |
| Study area | 73.5 | 2.1 |
| Greater Sydney | 58.4 | 6.5 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-5 Core activity need for assistance, 2016

| Locality | Has need for assistance (%) |
|---------------------------|-----------------------------|
| Balmain | 2.4 |
| Leichhardt-Annandale | 3.9 |
| Lilyfield-Rozelle | 3.6 |
| South Harbour Precinct | 3.4 |
| Cremorne-Cammeray | 1.9 |
| Crows Nest-Waverton | 1.8 |
| Mosman | 3.1 |
| Neutral Bay-Kirribilli | 3.0 |
| North Sydney-Lavender Bay | 1.6 |
| St Leonards-Naremburn | 1.9 |
| North Harbour Precinct | 2.4 |
| Study area | 2.7 |
| Greater Sydney | 4.9 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-6 Household composition, 2016

| Locality | Family household (%) | Lone person household (%) | Group household (%) | Number of households |
|---------------------------|----------------------|---------------------------|---------------------|----------------------|
| Balmain | 64.3 | 30.9 | 4.8 | 6231 |
| Leichhardt-Annandale | 65.0 | 27.2 | 7.8 | 9862 |
| Lilyfield-Rozelle | 66.3 | 27.6 | 6.1 | 5420 |
| South Harbour Precinct | 65.1 | 28.4 | 6.5 | 21,513 |
| Cremorne-Cammeray | 61.2 | 33.8 | 5.0 | 8185 |
| Crows Nest-Waverton | 59.6 | 32.7 | 7.7 | 7988 |
| Mosman | 67.7 | 29.4 | 2.9 | 11,022 |
| Neutral Bay-Kirribilli | 53.5 | 38.9 | 7.4 | 8167 |
| North Sydney-Lavender Bay | 57.5 | 36.3 | 6.2 | 4791 |
| St Leonards-Naremburn | 63.7 | 29.6 | 6.7 | 4367 |
| North Harbour Precinct | 60.9 | 33.3 | 5.7 | 44,520 |
| Study area | 62.3 | 31.7 | 6.0 | 66,033 |
| Greater Sydney | 73.6 | 21.6 | 4.7 | 1,623,872 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-7 Dwelling structure, 2016

| Locality | Separate house (%) | Semi-detached house (%) | Flat, unit or apartment (%) | Total dwellings | Occupancy rate (%) |
|----------|--------------------|-------------------------|-----------------------------|-----------------|--------------------|
| Balmain | 6.5 | 53.8 | 29.5 | 6889 | 90.4 |

| Locality | Separate house (%) | Semi-detached house (%) | Flat, unit or apartment (%) | Total dwellings | Occupancy rate (%) |
|---------------------------|--------------------|-------------------------|-----------------------------|-----------------|--------------------|
| Leichhardt-Annandale | 19.9 | 48.7 | 20.8 | 10,792 | 91.4 |
| Lilyfield-Rozelle | 16.9 | 43.3 | 29.5 | 5949 | 91.1 |
| South Harbour Precinct | 15.2 | 48.8 | 25.5 | 23,630 | 91.0 |
| Cremorne-Cammeray | 18.6 | 11.1 | 61.2 | 8977 | 91.2 |
| Crows Nest-Waverton | 8.4 | 19.4 | 62.7 | 8774 | 91.0 |
| Mosman | 31.5 | 10.8 | 46.0 | 12,398 | 88.9 |
| Neutral Bay-Kirribilli | 6.7 | 8.9 | 71.4 | 9328 | 87.6 |
| North Sydney-Lavender Bay | 4.7 | 11.8 | 65.1 | 5837 | 82.1 |
| St Leonards-Naremburn | 17.7 | 9.4 | 62.2 | 4864 | 89.8 |
| North Harbour Precinct | 16.1 | 12.0 | 60.2 | 50,178 | 88.7 |
| Study area | 15.8 | 23.8 | 49.1 | 73,808 | 89.5 |
| Greater Sydney | 52.5 | 12.9 | 25.9 | 1,759,927 | 92.3 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-8 Tenure type, 2016

| Locality | Owned outright (%) | Owned with a mortgage (%) | Rented (%) |
|---------------------------|--------------------|---------------------------|------------|
| Balmain | 29.8 | 28.4 | 39.4 |
| Leichhardt-Annandale | 24.0 | 33.0 | 40.4 |
| Lilyfield-Rozelle | 25.1 | 33.4 | 39.0 |
| South Harbour Precinct | 26.0 | 31.8 | 39.8 |
| Cremorne-Cammeray | 29.5 | 24.8 | 43.3 |
| Crows Nest-Waverton | 24.5 | 23.6 | 49.8 |
| Mosman | 36.3 | 26.5 | 34.3 |
| Neutral Bay-Kirribilli | 23.5 | 18.4 | 54.9 |
| North Sydney-Lavender Bay | 23.6 | 17.1 | 56.4 |
| St Leonards-Naremburn | 20.6 | 26.5 | 50.6 |
| North Harbour Precinct | 27.7 | 23.2 | 46.5 |
| Study area | 27.1 | 26.0 | 44.3 |
| Greater Sydney | 29.1 | 33.2 | 34.1 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-9 Vehicle ownership, 2016

| Locality | Households with no vehicle (%) | Households with one vehicle (%) | Households with two or more vehicles (%) |
|----------------------|--------------------------------|---------------------------------|--|
| Balmain | 13.8 | 50.7 | 32.9 |
| Leichhardt-Annandale | 13.9 | 48.4 | 35.0 |

| Locality | Households with no vehicle (%) | Households with one vehicle (%) | Households with two or more vehicles (%) |
|---------------------------|--------------------------------|---------------------------------|--|
| Lilyfield-Rozelle | 11.5 | 50.1 | 35.5 |
| South Harbour Precinct | 13.2 | 49.5 | 34.5 |
| Cremorne-Cammeray | 10.5 | 53.3 | 34.1 |
| Crows Nest-Waverton | 15.4 | 57.6 | 25.0 |
| Mosman | 10.1 | 45.8 | 42.0 |
| Neutral Bay-Kirribilli | 20.7 | 52.6 | 24.2 |
| North Sydney-Lavender Bay | 23.4 | 53.5 | 20.3 |
| St Leonards-Naremburn | 21.5 | 50.7 | 25.7 |
| North Harbour Precinct | 15.6 | 51.9 | 30.3 |
| Study area | 14.8 | 51.1 | 31.7 |
| Greater Sydney | 11.1 | 37.1 | 48.5 |

Source: 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-10 Household income, 2016

| Locality | Median total income (\$ / week) | | Weekly household income (%) | |
|---------------------------|---------------------------------|------------------|-----------------------------|----------------|
| | Personal income | Household income | <\$650 / week | >\$2000 / week |
| Balmain | \$1376 | \$2673 | 3.6 | 80.6 |
| Leichhardt-Annandale | \$1126 | \$2301 | 4.4 | 73.7 |
| Lilyfield-Rozelle | \$1332 | \$2601 | 4.1 | 78.6 |
| South Harbour Precinct | \$1278 | \$2525 | 4.1 | 76.9 |
| Cremorne-Cammeray | \$1357 | \$2385 | 3.7 | 77.9 |
| Crows Nest-Waverton | \$1370 | \$2364 | 3.4 | 77.7 |
| Mosman | \$1295 | \$2522 | 3.6 | 79.8 |
| Neutral Bay-Kirribilli | \$1366 | \$2265 | 4.2 | 78.4 |
| North Sydney-Lavender Bay | \$1477 | \$2466 | 2.9 | 80.6 |
| St Leonards-Naremburn | \$1345 | \$2399 | 5.3 | 76.3 |
| North Harbour Precinct | \$1368 | \$2400 | 3.8 | 78.6 |
| Study area* | \$1338 | \$2442 | 3.9 | 78.0 |
| Greater Sydney | \$719 | \$1750 | 8.9 | 54.9 |

*Average of median incomes for SA2s in the study area

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-11 Labour force, 2016

| Locality | Labour force | Labour force participation (%) | Unemployment (%) |
|----------------------|--------------|--------------------------------|------------------|
| Balmain | 8722 | 67.3 | 4.0 |
| Leichhardt-Annandale | 15,094 | 70.4 | 4.1 |

| Locality | Labour force | Labour force participation (%) | Unemployment (%) |
|---------------------------|--------------|--------------------------------|------------------|
| Lilyfield-Rozelle | 8007 | 70.2 | 3.6 |
| South Harbour Precinct | 31,823 | 69.5 | 3.9 |
| Cremorne-Cammeray | 11,273 | 70.3 | 3.8 |
| Crows Nest-Waverton | 11,533 | 73.5 | 3.4 |
| Mosman | 14,575 | 62.1 | 3.9 |
| Neutral Bay-Kirribilli | 11,067 | 69.5 | 3.8 |
| North Sydney-Lavender Bay | 6679 | 69.3 | 3.8 |
| St Leonards-Naremburn | 6586 | 74.0 | 3.9 |
| North Harbour Precinct | 61,713 | 68.8 | 3.8 |
| Study area | 93,536 | 69.1 | 3.8 |
| Greater Sydney | 2,418,899 | 61.6 | 6.0 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Table B-12 Travel to work, 2016

| Locality | One method | | | | | | | | Two methods | | | | | Three methods | | | Worked at home | Did not go to work | Method of travel not stated |
|---------------------------|------------|----------|------------------------|-----------------------------------|------------------|-------|-------------------|------------------|--|--|--------------------------------------|--|-------------------|-----------------------------|--|---------------------|----------------|--------------------|-----------------------------|
| | Train only | Bus only | Other public transport | Car only (as driver or passenger) | Walked or cycled | Truck | Motorbike/scooter | Other one method | Train and car (as driver or passenger) | Train and one other method (excluding car) | Bus and car (as driver or passenger) | Bus and one other method (excluding car) | Other two methods | Train and two other methods | Bus and two other methods (excl train) | Other three methods | | | |
| Balmain | 0.5 | 18.3 | 8.7 | 38.6 | 7.7 | 0.2 | 1.3 | 0.8 | 0.1 | 3.7 | 0.4 | 1.7 | 0.9 | 0.7 | 0.3 | 0.0 | 8.0 | 7.3 | 0.6 |
| Leichhardt-Annandale | 3.7 | 16.6 | 4.5 | 42.1 | 8.8 | 0.3 | 1.6 | 0.7 | 0.7 | 3.7 | 0.5 | 0.7 | 0.8 | 0.6 | 0.1 | 0.1 | 5.8 | 8.0 | 0.7 |
| Lilyfield-Rozelle | 0.8 | 22.0 | 2.7 | 43.2 | 8.4 | 0.4 | 1.5 | 0.6 | 0.1 | 3.7 | 0.6 | 0.7 | 0.8 | 0.4 | 0.2 | 0.1 | 6.0 | 7.0 | 0.8 |
| South Harbour Precinct | 2.1 | 18.4 | 5.2 | 41.4 | 8.4 | 0.3 | 1.5 | 0.7 | 0.4 | 3.6 | 0.5 | 1.0 | 0.8 | 0.6 | 0.2 | 0.1 | 6.5 | 7.6 | 0.7 |
| Cremorne-Cammeray | 0.9 | 25.4 | 2.2 | 40.9 | 7.2 | 0.1 | 1.2 | 0.6 | 0.2 | 4.0 | 0.5 | 0.8 | 0.6 | 0.9 | 0.1 | 0.1 | 6.6 | 7.2 | 0.5 |
| Crows Nest-Waverton | 24.4 | 12.0 | 0.4 | 30.6 | 13.0 | 0.1 | 0.9 | 0.6 | 0.5 | 3.7 | 0.2 | 0.2 | 0.4 | 0.5 | 0.0 | 0.0 | 5.6 | 6.3 | 0.5 |
| Mosman | 0.5 | 21.0 | 3.7 | 43.3 | 5.4 | 0.1 | 1.0 | 0.7 | 0.2 | 2.7 | 0.6 | 1.7 | 0.9 | 0.9 | 0.3 | 0.1 | 8.8 | 7.5 | 0.7 |
| Neutral Bay-Kirribilli | 14.0 | 15.8 | 4.2 | 32.4 | 12.2 | 0.1 | 0.9 | 0.6 | 0.4 | 4.6 | 0.3 | 0.5 | 0.4 | 0.9 | 0.1 | 0.1 | 5.6 | 6.2 | 0.8 |
| North Sydney-Lavender Bay | 29.5 | 7.0 | 1.5 | 24.4 | 17.6 | 0.1 | 0.8 | 1.0 | 0.5 | 3.7 | 0.0 | 0.3 | 0.3 | 0.7 | 0.0 | 0.0 | 6.5 | 5.6 | 0.5 |
| St Leonards-Naremburn | 27.9 | 10.3 | 0.5 | 29.9 | 12.0 | 0.1 | 0.9 | 0.6 | 0.6 | 2.9 | 0.5 | 0.2 | 0.5 | 0.4 | 0.0 | 0.0 | 4.8 | 7.1 | 0.6 |
| North Harbour Precinct | 13.5 | 16.5 | 2.3 | 35.1 | 10.4 | 0.1 | 0.9 | 0.6 | 0.4 | 3.6 | 0.4 | 0.7 | 0.6 | 0.8 | 0.1 | 0.0 | 6.6 | 6.7 | 0.6 |
| Study area | 9.6 | 17.2 | 3.3 | 37.2 | 9.7 | 0.2 | 1.1 | 0.7 | 0.4 | 3.6 | 0.4 | 0.8 | 0.6 | 0.7 | 0.1 | 0.1 | 6.5 | 7.0 | 0.6 |
| Greater Sydney | 10.9 | 5.5 | 0.7 | 56.6 | 4.8 | 0.9 | 0.7 | 0.5 | 1.8 | 2.9 | 0.4 | 0.1 | 0.6 | 0.6 | 0.0 | 0.0 | 4.4 | 7.8 | 0.9 |

Source: Based on 2016 Census of Population and Housing, Australian Bureau of Statistics.

Appendix C. Social infrastructure near the project

| Type of facility | Facility | Location | Description |
|---|---|---|---|
| South Harbour Precinct | | | |
| Places of worship and cultural facilities | St Thomas' Anglican Church | Darling Street, Rozelle | The church holds two Sunday services at 10am and 5pm. |
| | Chapel Hill Rozelle Presbyterian Church | Darling Street, Rozelle | The church holds a Sunday service at 10.30am, including Kids Church for children up to Year 6. |
| | The Christian Community in Australia | Montague Street, Balmain | The church provides regular services on weekday mornings and on Sunday morning, with evening events also held at various times. |
| | St John the Evangelist, Balmain | Corner of Birchgrove Road and Spring Street, Birchgrove | The church provides regular services on weekday mornings and on Sunday morning, including Sunday schools on the first and third Sunday of each month, and is also used for other activities during daytime and evenings. |
| | C3 Church Rozelle | Robert Street, Rozelle | The church has regular Sunday morning services and is also used for other regular activities |
| | Balmain Library | Darling Street, Balmain | The library is open Monday to Thursday (9.30am to 8pm), Friday (9.30am to 5.00pm), and Saturday and Sunday (10am to 4pm). |
| Education facilities | Rozelle Public School | Darling Street, Rozelle | Public primary school offering primary education for students in Kindergarten to Year 6. In 2016, the school had an enrolment of 612 students (My School, 2017a). The Rozelle Public School Pre-School, located within the school, provides school education for about 40 students in two classes. The preschool operates Monday to Friday during the school term, between 9am and 3pm (Rozelle Public School, 2017). An out-of-school-hours care service operates on the school site providing before-school care (7.15am to 9am), after-school care (3pm to 6pm) and vacation care (7am to 6pm) for children in Kindergarten to Year 6. |
| | Birchgrove Public School | Birchgrove Road, Balmain | The school offers primary education for students in Kindergarten to Year 6. In 2017, the school had an enrolment of 356 students (My School, 2017h). |
| | Petersham TAFE College (Annandale Campus) | Johnston Street, Annandale | Petersham TAFE College offers vocational training and tertiary education. |
| Childcare facilities | The Jimmy Little Community Centre | Cecily Street, Lilyfield | Community hall which is used for playgroup, music classes, tai chi, Pilates, yoga, and other regular activities, meetings and events. |
| | St Thomas' Rozelle Child Care Centre | Darling Street, Rozelle | The centre offers long day child care for children aged between two and five years. The centre is open Monday to Fridays from 7.30am to 5.30pm. |

| Type of facility | Facility | Location | Description |
|--|--|--|--|
| | KU Phoenix Preschool | Evans Street, Balmain | The preschool provides early childhood education for about 35 children. Operating hours are Monday to Friday between 8am and 3.30pm. |
| | Balmain-Rozelle Occasional Care Centre | Darling Street, Balmain | The child care centre caters for children up to five years Monday to Friday, between 8.30am and 1.30pm (Monday and Wednesday) or 3.30pm (Tuesday, Thursday and Friday). |
| Health, medical and emergency services | Rozelle Medical Centre | Darling Street, Rozelle | The medical centre is open Monday to Friday (8am to 7pm) and Saturdays and Sundays (9am to 1pm). Bulk billing is available at the medical centre. |
| | Doctors on Darling | Montague Street, Balmain | The surgery is open Monday; Wednesday to Friday (7.30am to 6pm), Tuesday (7.30am to 6.30pm), and Saturday (9am to 12pm). |
| | Balmain Police Station | Darling Street, Balmain | The police station forms part of the Leichhardt Local Area Command and is open 24 hours a day, seven days a week. |
| Aged care | St Basil's Annandale | Johnston Street, Annandale | The facility provides 83 beds for residential aged care, respite care, palliative care and secure dementia care (Aged Care Guide, undated). |
| Sport, recreation and leisure facilities | Buruwan Park | Corner of Railway Parade and Bayview Crescent, Annandale | Open space located between the corner of Railway Parade and Bayview Crescent and the rail corridor. |
| | Birrung Park | Donnelly Street, Balmain | A long area of open space that hugs White Bay offering fantastic views. The park has only native vegetation both established and newly planted to improve native habitat and biodiversity in the area. A designated area of the park is available for leash-free dog exercise (Inner West Council, 2019) |
| | Federal Park | Chapman Road, Rozelle | Federal Park forms part of the Glebe Foreshore Parks. The park provides opportunities for formal and informal recreation activities and an off-leash area for dogs. |
| | Easton Park | Denison Street, Rozelle | The park is used for cricket, soccer and football. The park includes a children's playground, picnic tables, change rooms and off-leash areas for dogs. Commercial fitness training is also permitted at the park. |
| | O'Connor Reserve | Prince Street, Rozelle | A local park which provides open space, children's play equipment and off-leash dog areas. |
| | Stimson Reserve | Corner of Brent Street and MacKenzie Street, Rozelle | A local park which provides open space and children's play equipment. |
| | Ann Cashman Reserve | Corner of Beattie Street and Elliott Street, Balmain | The park provides information recreation opportunities, as well as a fenced playground and picnic tables. The park also provides off-leash areas for dogs. |

| Type of facility | Facility | Location | Description |
|---|---|--------------------------------|--|
| | Balmain Sailing Club | Water Street, Birchgrove | The sailing club fronts the Parramatta River and provides sailing school, and racing and other events for the local and regional community. |
| | Birchgrove Park | The Terrace, Birchgrove | The park provides informal and formal recreation opportunities and includes tennis courts and a sports oval. |
| | Yurulbin Park | Louisa Road, Birchgrove | Yurulbin Park is a waterfront park, providing views of Sydney Harbour. The park is surrounded by residential properties located along Louisa Road. The park provides opportunities for informal recreational activities. The park is also used for wedding ceremonies, fishing and off-leash dog areas. Yurulbin Park is a vantage point for the New Years' Eve fireworks at Sydney Harbour, providing free entry with a capacity of about 400 people. Birchgrove Wharf is located to the north of Yurulbin Park. |
| | Balmain Police Citizens Youth Club (PCYC) | Darling Street, Balmain | Balmain PCYC is a youth organisation which provides regular activities (such as rugby league and boxing) and other events. The Balmain PCYC was established on 1938 (PCYC NSW, undated). |
| Community support services | Rozelle Neighbourhood Centre | Darling Street, Rozelle | The centre provides group and individual services for people with a disability and their families and the elderly, as well as drop in sessions. The centre also provides community and cultural development services. |
| | Balmain Town Hall | Darling Street, Balmain | The heritage listed building includes a main hall and meeting room for hire by the public. The hall hosts events such as performance, concerts, workshops, conferences and rehearsals. |
| North Harbour Precinct | | | |
| Places of worship and cultural facilities | Church by the Bridge | Broughton Street, Kirribilli | The church provides regular services on Sunday morning, with other events also held at various times. |
| | Spirit of Life Unitarian Fellowship | Fitzroy Street, Kirribilli | The church provides regular services on Sunday morning, with other events also held at various times. |
| | Chinese Christian Church Sydney | Alfred Street, Milsons Point | The church provides regular services on Sunday, including services in English, Mandarin and Cantonese. |
| | St Francis Xavier Catholic Church | Mackenzie Street, Lavender Bay | The church provides regular services during the weeks and on weekends. |
| | Mary Mackillop Place | Mount Street, North Sydney | Mary Mackillop Place includes a chapel, museum, facilities for meetings and events, and accommodation. |
| | International Society for Krishna Consciousness (ISKCON) Sydney | Falcon Street, North Sydney | ISKCON Sydney (also known as Hare Krishna) provides a number of regular temple services, weekly classes and Sunday school. |
| | Sydney Life Church | Yeo Street, Neutral Bay | The church provides regular services on Sunday morning, with other events also held at various times. |

| Type of facility | Facility | Location | Description |
|----------------------|------------------------------------|--|---|
| | Naremburn Cammeray Anglican Church | Willoughby Road, Naremburn | The church provides regular services on Sunday morning, with other events also held at various times. The church is currently being refurbished. |
| | St Leonards Catholic Church | Donnelly Road and Willoughby Road, Naremburn | The church provides weekday and weekend services. |
| | St Mary's Catholic Church | Miller Street, North Sydney | The church provides weekday and weekend services. |
| | St Thomas' Anglican Church | McLaren Street and Church Street, North Sydney | The church provides regular services on Sunday mornings and evenings, with other events also held at various times. |
| | Richard Bailey Library | Walker Street, North Sydney | The library forms part of the Australian Society for Anaesthetics and is open Monday to Friday (9am to 5pm), by appointment only. |
| | The Independent Theatre | Miller Street, North Sydney | Provides a theatre venue for musical and other performances. |
| | Naremburn Library | Central Street, Naremburn | The library is open Monday and Thursday (2.30pm to 5pm) and Saturdays (9.30am to 12pm). |
| | North Sydney Stanton Library | Miller Street, North Sydney | The library is open Monday to Thursday (9am to 9pm), Fridays (9am to 6pm) and Saturdays and Sundays (10am to 5pm). |
| Education facilities | St Aloysius College Junior School | Burton Street, Milsons Point | Provides primary and secondary school education for students in Year 3 to Year 12. In 2016, the school had an enrolment of 1246 students (My School, 2017b). |
| | Monte Sant Angelo Mercy College | Miller Street, North Sydney | Provides secondary school education for students (girls) in Year 7 to Year 12. In 2016, the school had an enrolment of 1164 students (My School, 2017c). |
| | ANZAC Park Public School | Corner of Ernest Street and ANZAC Avenue, Cammeray | Provides primary school education to students in Kindergarten to Year 6. The school opened in January 2016 and had an enrolment of 77 students in 2016 (My School, 2017d). The school's capacity is 1000 students and it is expected the school will grow rapidly in the next few years (ANZAC Park Public School, undated). |
| | Naremburn School | Willoughby Road, Naremburn | The school provides secondary education for students in Year 7 to Year 12. The school caters for up to 35 students. In 2016, the school had an enrolment of 26 students (My School, 2017i). |
| | Wenona School | Walker Street, North Sydney | The private girls school offers primary and secondary education to students in Kindergarten to Year 12. In 2016, the school had an enrolment of 1081 students. The school also provides accommodation for up to 50 boarders (My School, 2017e). The school also offers an after school care service for students in Kindergarten to Year 6, which operates from 2.50pm to 6pm on school days. |

| Type of facility | Facility | Location | Description |
|----------------------|--|---|--|
| | St Thomas North Sydney Preschool | McLaren Street, North Sydney | Provides preschool education for students aged three to five years. |
| | North Sydney Boys High School | Falcon Street, Crows Nest | The school provides secondary education for students in Year 7 to Year 12. In 2016, the school had an enrolment of 923 students (My School, 2017f). |
| | North Sydney Public School | Bay Road, Waverton | The school provides primary education for students in Kindergarten to Year 6. In 2016, the school had an enrolment of 816 students (My School, 2017j). |
| | Marist College North Shore | Miller Street, North Sydney | The school provides secondary education for students in Year 7 to Year 12. In 2016, the school had an enrolment of 844 students (My School, 2017g). |
| | The Coal Loader Centre for Sustainability | Balls Head Drive, Waverton | The Coal Loader Centre for Sustainability is a “regional learning hub for sustainable living, showcasing innovation and best practice on sustainability” (North Sydney Council, undated). The centre includes a community garden and nursery, Aboriginal bush foods garden and rock engraving, historic coal loading tunnel, and a foreshore park and walks. |
| Childcare facilities | CareAdore | Bligh Street, Kirribilli | Provides day care services. |
| | KU Greenwood Children’s Centre | Pacific Highway, North Sydney | Provides child care facilities for babies, toddlers and pre-schoolers, generally between 7.30am and 6pm Monday to Friday. |
| | KU Tree Tops Child Care Centre | Miller Street, North Sydney | Provides child care facilities for babies, toddlers and pre-schoolers, generally between 7.30am and 6pm Monday to Friday. |
| | KU Dem School Kids Care | Corner Pacific Highway and Bay Road, North Sydney | Provides after-school-hours care for primary aged children after school, generally between 3pm and 6pm and on pupil free days. |
| | Toybox Early Learning | Miller Street, North Sydney | The day care centre caters for up to 38 children aged between six weeks and six years. The centre is open from 7.30am to 6pm Monday to Friday. |
| | Royal North Shore Hospital Child Care Centre | Pacific Highway, North Sydney | The day care centre provides long day care and is open from 6.45am to 6pm Monday to Friday. |
| | Guardian Early Learning (Walker Street) | Walker Street, North Sydney | The centre includes nursery, toddler, kindergarten and preschool programs and is open 8am to 6pm Monday to Friday. |
| | Guardian Early Learning (Arthur Street) | Arthur Street, North Sydney | The centre includes nursery, toddler, kindergarten and preschool programs and is open 8am to 6pm Monday to Friday. |
| | Only About Children North Sydney Campus | Berry Street, North Sydney | The centre is open 7am to 6pm Monday to Friday. |
| | Good Start Early Learning North Sydney | Berry Street, North Sydney | The centre provides child care services for up to 89 children, including nursery, toddlers, preschool and vacation care. |

| Type of facility | Facility | Location | Description |
|--|--|--|---|
| | Blue Camp North Sydney | Miller Street, North Sydney | Provides care for school students (Kindergarten to Year 9) during school holiday periods. |
| | KU Grandstand Kids Care | Fig Tree Lane, North Sydney | The centre provides after-school care Monday to Friday 3pm to 6pm. |
| | KU Cammeray Preschool | Warwick Avenue, Cammeray | The centre caters for pre-schoolers and is open 8am to 3.30pm Monday to Friday. |
| | Only About Children Cammeray Campus | Miller Street, Cammeray | The centre is open from 7am to 6pm Monday to Friday. |
| | Happy Kids Family Day Care Cammeray | Massey Street, Cammeray | The centre provides day care services and is open Monday to Thursday 8am to 6pm. |
| | Naremburn Early Learning Centre | Donnelly Road, Naremburn | The centre provides day care services for children aged from six weeks to five years. |
| | White Rabbit Child Care Centre | Merrenburn Avenue, Naremburn | The centre provides long day care services and is open Monday to Friday 7.30am to 6pm. |
| | Willoughby Community Preschool | Central Street, Naremburn | The preschool provides long day care and is open Monday to Friday from 8am to 4pm. |
| | KU Dem School Kids Care | Pacific Highway and Bay Road, North Sydney | The centre is located at the North Sydney Demonstration School and provides before and after-school care Monday to Friday 7.30am to 9am and 3pm to 6pm. |
| | SND Northern Suburbs Children's Education and Care | Rodborough Avenue, Crows Nest | The centre provides day care services for up to 75 children aged between six weeks to six years. |
| | Alouette Child Care Centre | Rodborough Avenue, Crows Nest | Provides early learning services for children aged five years and under. |
| | Butterflies Early Learning Childcare Centre | Waltham Street, Artarmon | Provides early childhood and school readiness programs. The centre includes outdoor play spaces. The centre is open from 7am to 6pm, Monday to Friday. |
| Health, medical and emergency services | North Shore Medical Group | Alfred Street, Milsons Point | Provides vein, heart, weight loss and homecare medical services. The facility also provides psychology and counselling services. |
| | Greenwood Medical Centre | Pacific Highway, North Sydney | General medical practice which is open Monday to Wednesday and Fridays (8am to 6pm) and Thursdays (8am to 9pm). |
| | North Sydney Medical Centre | Walker Street, North Sydney | General medical practice, skin cancer clinic and cosmetic medicine centre which is open Monday to Friday. |
| | North Sydney Plaza Medical Centre | Mount Street, North Sydney | General medical practice which is open Monday to Friday (8am to 6pm). |
| | Walker Street Doctors | Walker Street, North Sydney | General medical practice. |
| | Miller Street Medical Practices | Walker Street, North Sydney | General medical practice. |
| | Harbour Radiology | Walker Street, North Sydney | Medical practice specialising in radiology, women's health imaging and other sub-specialty examinations. |

| Type of facility | Facility | Location | Description |
|--|---|---|---|
| | Cammeray Medical Practice | Miller Street, Cammeray | General medical practice open Monday to Friday (8:00am to 5:30pm) and Saturdays (8:00am to 12:30pm). |
| | North Sydney State Emergency Service | Balls Head Drive, Waverton | Volunteer emergency and rescue service. |
| | Artarmon Ambulance Superstation | Reserve Road, Artarmon | The Superstation supports the Artarmon Paramedic Response Network cluster and is where paramedics start and end their shifts. The facility includes parking for 20 ambulances, administration facilities, logistics and storage areas, and staff facilities. |
| Aged care | James Milson Village | Clark Road, North Sydney | The village provides retirement living and residential care, including 97 apartments in two buildings and 132 places for residential care. The village includes a library, chapel, hairdresser, function area and gym. |
| Sport, recreation and leisure facilities | Bradfield Park | Alfred Street, Milsons Point | Provides open space and informal recreation activities, as well as children's play equipment, and seats and picnic tables. The park is located near Luna Park and North Sydney Olympic Pool. |
| | Little Alfred Tennis/ Kirribilli Tennis Centre | Little Alfred Street, Milsons Point | Provides three tennis courts available for public use. |
| | Park/open space at Kirribilli | Alfred Street | Provides an area of open space. |
| | Doris Fitton Park | Little Walker Street, North Sydney | Provides an area of open space. |
| | Merlin Street Reserve | Merlin Street, North Sydney | A small area of open space next to residential properties. |
| | Rose Avenue Reserve | Rose Avenue, North Sydney | A small area of open space near residential properties. |
| | North Sydney Bowling Club | Ridge Street, North Sydney | Provides social and club bowls for the local community, the venue also hosts functions and other social events. |
| | St Leonards Park (including North Sydney Oval and Bon Andrews Oval) | Corner of Falcon Street and Miller Street, North Sydney | St Leonards Park provides informal and formal recreation opportunities, including a children's playground. North Sydney Oval is located within the park, which provides sports facilities, such as netball courts, cricket nets and wicket, and Bon Andrews Oval. The North Sydney Oval also contains a function centre and childcare facility. The North Sydney War Memorial is located at St Leonards Park. |
| | Forsyth Park | Montpelier Street, Neutral Bay | Provides for informal and formal recreational opportunities. The park includes a sports field which is used for cricket, soccer, hockey, football and school sports carnivals. The park also includes a community garden and community centre. Bush regeneration is carried out in the park by the Forsyth Park Bushcare Group. |
| | Jeaffreson Jackson Reserve | Moodie Lane, Cammeray | Provides an area of open space. |

| Type of facility | Facility | Location | Description |
|------------------|---------------------------------|--|--|
| | ANZAC Park | Corner of Ernest Street and ANZAC Avenue, Cammeray | The park consists of open space and provides for informal recreational opportunities. In September 2017, North Sydney Council carried out consultation with the local community regarding the potential use of the park as a community garden. |
| | ANZAC Avenue Reserve | Cammeray Avenue, Cammeray | Area of open space providing informal recreational opportunities. |
| | Cammeray Golf Course | Corner of Ernest Street and Park Avenue, Neutral Bay | The golf course is a private nine-hole golf course. The facility also includes a function room which caters for corporate activities, conferences, weddings and other private events. |
| | Cammeray Tennis Club | Corner of Ernest Street and Park Avenue, Cammeray | The club includes four tennis courts and hosts club tennis, competitions, coaching and other social activities. |
| | Cammeray-Neutral Bay Skate Park | Ernest Street, Neutral Bay | Provides skate park facilities for the local community. |
| | Cammeray Croquet Club | Corner of Ernest Street and Park Avenue, Cammeray | Provides croquet facilities, including a number of playing sessions on the weekend and during the week. Friday morning hosts handicap croquet games. |
| | Cammeray Park | Park Avenue, Cammeray | The park provides for formal recreational opportunities, including synthetic turf for soccer and football. |
| | Green Park | Cammeray Road, Cammeray | The park includes an area of open space and two tennis courts. |
| | St Thomas Rest Park | West Street, Crows Nest | The park has social and historical significance and is the site of the first European cemetery on the North Shore (North Sydney Council, 2014). |
| | Love'N Deuce | Talus Street, St Leonards | The tennis club provides eight tennis courts which are available for public use. The club provides coaching, competitions, and holiday camps. |
| | Park | Miller Street | Provides an area of open space with seats and picnic tables. |
| | Waverton North Sydney Club | Woolcott Street, Waverton | The club provides lawn bowls facilities, as well as caters for private functions. The club is located within Waverton Park. |
| | Waverton Park | Woolcott Street, Waverton | Waverton Park is located on the foreshore of Sydney Harbour. The park includes an area of open space, seats and picnic tables, and a children's playground. |
| | Carradah Park | Larkin Street, Waverton | The park is located next to Waverton Park on the foreshore of Sydney Harbour. The park contains lookout platforms and walking tracks. The park has Aboriginal and non-Aboriginal heritage significance. |
| | Sugar Works Reserve | Ross Street, Waverton | The reserve fronts Balls Head Bay and provides open space for informal recreational activities. |

| Type of facility | Facility | Location | Description |
|----------------------------|---------------------------------------|-------------------------------------|---|
| | David Earle Reserve | Commodore Crescent, McMahon's Point | Provides an area of open space. |
| | Balls Head Reserve | Balls Head Drive, Waverton | The reserve provides the local and regional community with bush walking tracks, barbeques, picnic tables and seats. Bush reservation at the reserve is carried out by the Balls Head Bushcare Group (North Sydney Council, 2016). |
| | Greenwich Sailing Club | Manns Place, Greenwich | The sailing club is located on the foreshore of Sydney Harbour and provides sailing coaching and classes, as well as a function room for hire. |
| | Green Park Scout Hall | Cammeray Road, Cammeray | Provides a venue for scouts. |
| | North Sydney PCYC | Falcon Street, North Sydney | North Sydney PCYC is a youth organisation which provides regular sports activities (such as boxing, martial arts, gymnastics, dancing and indoor soccer) and other events. |
| Community support services | The Kirribilli Centre | Fitzroy Street, Kirribilli | Provides services such as play group, counselling, legal advice and alcoholic anonymous support services for the local community. The centre also provides rooms which can be hired by members of the community. |
| | Naremburn Community Centre | Central Street, Naremburn | The centre provides rooms which can be hired by members of the community. |
| | North Sydney Community Centre | Miller Street, North Sydney | Provides a venue for play group, after-school care, produce markets and other community events. |
| | Catholic Care Naremburn Family Centre | Merrenburn Avenue, Naremburn | Community support service. |

