

Chapter 21

Socio-economics

21 Socio-economics

This chapter considers the potential impacts of the project on socio-economic issues from the construction and operation of the project.

The Secretary's environmental assessment requirements as they relate to socio-economic issues and where in the environmental impact statement these have been addressed, are in Table 21-1.

The proposed environmental management measures relevant to socio-economics are included in Section 21.6.

Table 21-1 Secretary's environmental assessment requirements – Socio-economics

Secretary's requirement	Where addressed in EIS
Socio-economic, Land Use and Property	
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 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 as a result of the project are presented in Section 21.4 , Section 21.5 and Chapter 27 (Cumulative impacts). Engagement and consultation activities carried out to date and planned future consultation is outlined in Chapter 7 (Stakeholder and community engagement) and Section 21.2.3 .
2. The Proponent must assess impacts from construction and operation on potentially affected properties, businesses, recreational users and land and water users, 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.	Socio economic impacts as a result of the project are present in Section 21.4 and 21.5 . Impacts to properties, including property acquisitions and future land uses during construction and operation is discussed in Chapter 20 (Land use and property) and Chapter 27 (Cumulative impacts). Engagement and consultation activities carried out to date and planned future consultation is outlined in Chapter 7 (Stakeholder and community engagement) and Section 21.2.3 .
3. Where an immersed tube method (IMT) of construction is proposed for use in Sydney Harbour, the Proponent must:	See below.
a. provide details of how reductions to current Harbour depths will be avoided;	The immersed tube tunnel construction methodology is presented in Chapter 6 (Construction works). Details of the alternatives considered for the immersed tube tunnel are detailed in Chapter 4 (Project development alternations). An assessment on navigable water depths is provided in Appendix A of Appendix F (Technical working paper: Traffic and transport).

Secretary's requirement	Where addressed in EIS
b. provide details confirming the level of protection for the IMTs will be similar to or better than that of the existing Sydney Harbour Tunnel;	Chapter 6 (Construction work) provides details confirming the level of detail of protection for the immersed tube tunnels.
c. identify impacts to ship scheduling in consultation and agreement with the Harbour Master;	Chapter 8 (Construction traffic and transport) and Chapter 9 (Construction traffic and transport) outline impacts related to the construction and operation of the immersed tube tunnel respectively. Chapter 8 (Construction traffic and transport) specifies the consultation requirements with the Harbour Master to minimise impacts during construction. Section 21.4, Section 21.5 and Appendix U (Technical working paper: Socio-economic Assessment) discuss impacts to ship scheduling.
d. assess the impact to the Viva supply chain for fuel oils at Gore Cove; and	Chapter 8 (Construction traffic and transport), assesses the impacts related to construction activities in Sydney Harbour.
e. provide details of full mission simulation which takes in account, but is not necessarily limited to: <ul style="list-style-type: none"> i. movement and placement of the IMTs; and ii. identification of weather restrictions and towage requirements for the safe movement of seagoing ships to and from berths in Glebe Island, White Bay, Gore Cove and past proposed Project work areas in Glebe Island and White Bay, and Birchgrove to Waverton. 	Chapter 8 (Traffic and transport) presents the outcomes of the simulation report which shows that movements would be feasible and would be able to be carried out safely.
4. The Proponent must assess potential impacts on utilities (including communications, electricity, gas, fuel and water and sewerage) and the relocation of these utilities.	Chapter 6 (Construction works) and Appendix D (Utilities management strategy).
5. Where the project is predicted to impact on utilities the Proponent must undertake a utilities management strategy, identifying management options, including relocation or adjustment of the utilities.	Appendix D (Utilities management strategy).

Secretary's requirement	Where addressed in EIS
<p>6. A draft Community Consultation Framework must be prepared identifying relevant stakeholders, procedures for distributing information and receiving/responding to feedback and procedures for resolving stakeholder and community complaints during construction and operation. Key issues that must be addressed in the draft Framework include, but are not limited to:</p> <ol style="list-style-type: none"> traffic management (including property access, pedestrian access); landscaping/urban design matters; construction activities including out of hours work; and noise and vibration mitigation and management. 	<p>The content of the Framework is summarised in Chapter 7 (Stakeholder and community engagement). A draft Community consultation framework is provided in Appendix E (Community consultation framework).</p>

21.1 Legislative and policy framework

The socio-economic assessment has been prepared to assess the impacts of the project in accordance with the *Environmental Impact Assessment Practice Note – Social and economic assessment* (EIA-N05) (Practice Note) (Roads and Maritime, 2013b). The Practice Note guides the assessment level and process for socio-economic impact assessments and outlines the requirements for establishing the socio-economic baseline.

Chapter 3 (Strategic justification and project need) provides a description of national and state strategic planning and transport policies which are relevant to the project. Local council policies relevant to socio-economic impacts of the project include:

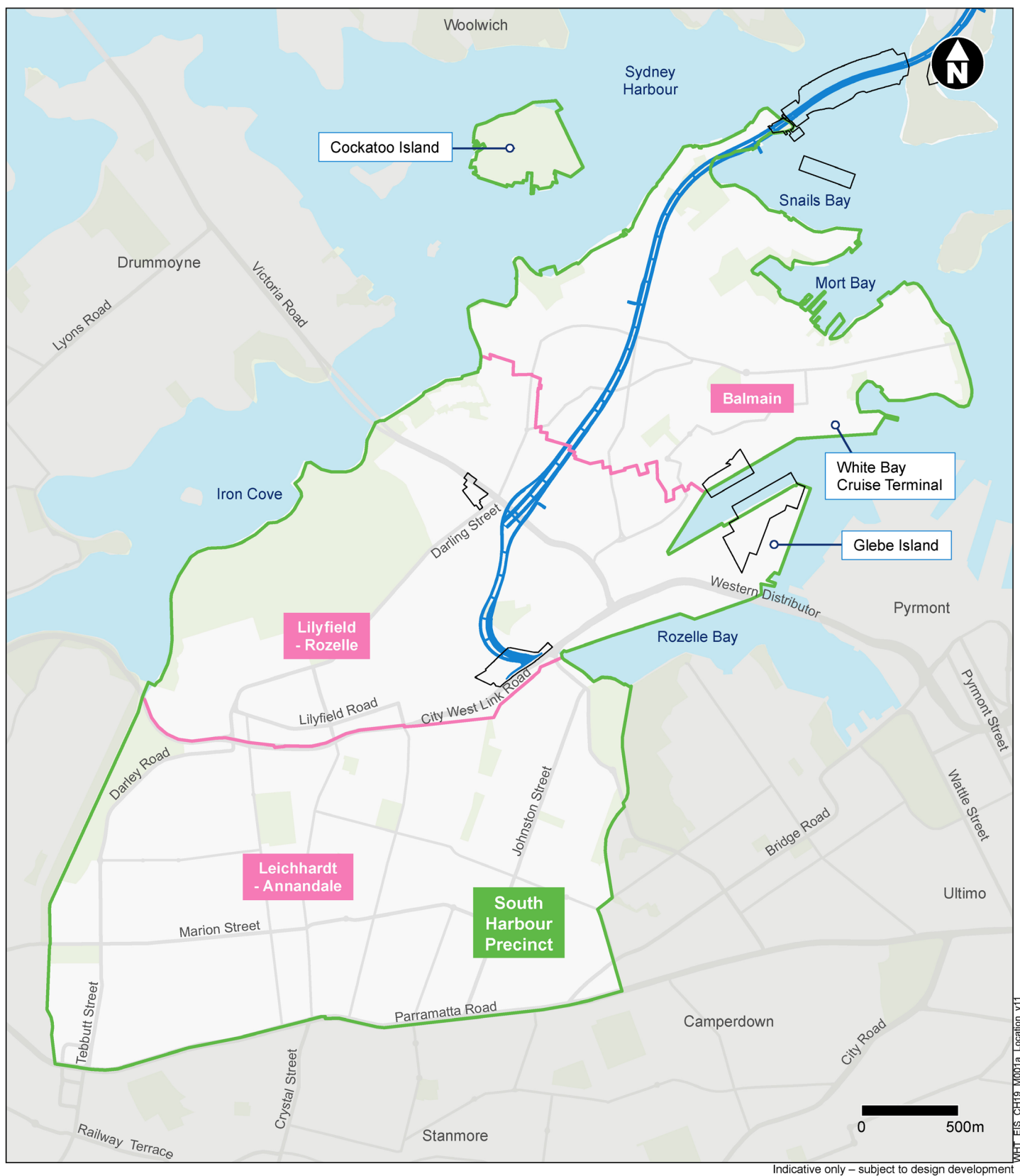
- *Statement of Vision and Priorities* (Inner West Council, 2016)
- *North Sydney Community Strategic Plan 2013-2023* (North Sydney Council, 2013)
- *Willoughby City Strategy* (Willoughby City, 2013)
- *Mosman Council Community Strategic Plan 2013-2023* (Mosman Council, 2013).

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.

21.2 Assessment methodology

21.2.1 Precinct areas

The socio-economic assessment considers precincts, including adjacent waterways and comprises the Australian Bureau of Statistics (ABS) geographic boundaries (referred to as Statistical Area Level 2s) (SA2s). For the purposes of this assessment, two precincts have been identified located to the north and south of Sydney Harbour, referred to as the South Harbour Precinct and North Harbour Precinct. These areas are shown in Figure 21-1 and Figure 21-2. Broader regional impacts were also considered, where relevant.



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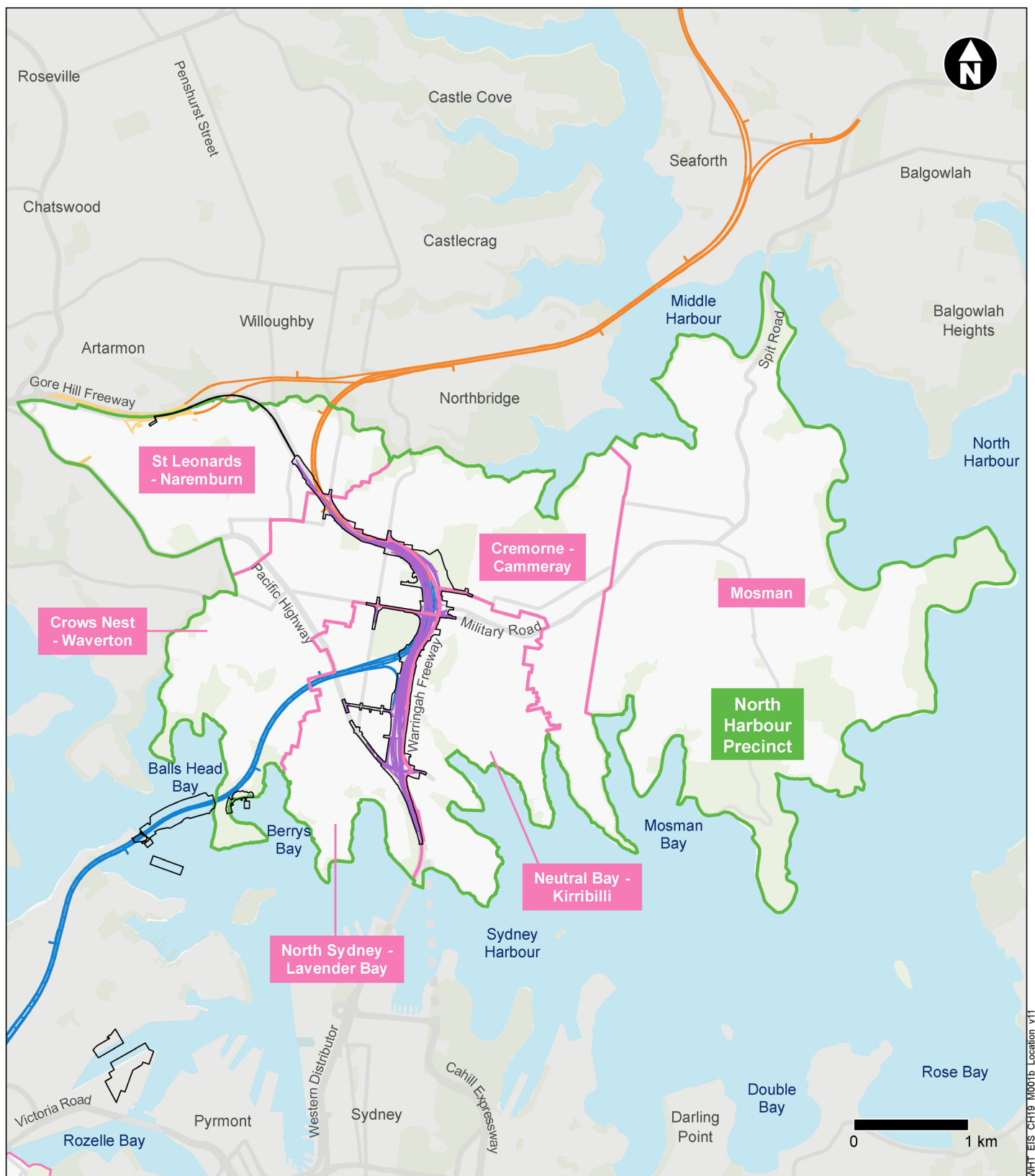
Operational features

- █ Western Harbour Tunnel
- Construction footprint

South Harbour precinct

- Precinct boundary
- █ Statistical area boundary

Figure 21-1 South Harbour Precinct



Indicative only – subject to design development

Legend

Operational features

- Western Harbour Tunnel
- Warringah Freeway Upgrade
- Construction footprint

Connecting projects

- Beaches Link
- Gore Hill Freeway Connection

North Harbour precinct

- Precinct boundary
- Statistical area boundary

Figure 21-2 North Harbour Precinct

21.2.2 Business surveys

A business impact survey was used to inform the business impact assessment to gain a better understanding of the main issues, perceptions and concerns of businesses in regard to the project during construction and operation. The business surveys were conducted in business centres that may be more susceptible to direct or indirect effects of construction and/or operation. All information gathered as part of the business surveys was collated into a database, analysed and summarised in a survey report. Further details are provided in the business impact assessment in Appendix U (Technical working paper: Socio-economic assessment). Further engagement with business stakeholders will be carried out during the environmental impact assessment exhibition period.

21.2.3 Stakeholder consultation

Community and stakeholder engagement, including consultation with relevant landowners (such as the Ports Authority of NSW and those landowners whose property is being acquired), local communities, businesses and government agencies, has informed the project's development. The socio-economic assessment has been informed by the outcomes of this engagement, including the identification of existing features and values important to the communities considered, and assessment of potential benefits and impacts of the project.

Further details regarding consultation carried out for the project (up to exhibition of the environmental impact statement) are provided in Chapter 7 (Stakeholder and community engagement).

21.2.4 Assessment approach

The socio-economic impact assessment involved identifying, assessing and evaluating changes to or impacts on communities, businesses and industry that are likely to occur as a result of the project. The assessment involved:

- Scoping the likely range of potential socio-economic impacts and identifying businesses and communities likely to be affected by the project
- Describing existing socio-economic and business characteristics, values and conditions in the study area. The description of existing socio-economic conditions principally draws on information from the ABS Census of Population and Housing 2016, supplemented with information and data from other publicly available sources and project specialist investigations
- 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. Positive and negative social and economic impacts are discussed, however the methodology used 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 receiver and the magnitude of the proposed works. An evaluation matrix was used to identify the level of significance of the negative impact. Further information on the evaluation matrix is provided in Section 21.2.5. Positive impacts are qualitatively discussed but have not been assigned a level of significance using the evaluation matrix. 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
- Identifying measures to avoid, minimise or mitigate impacts on communities and community infrastructure and business and industry arising from the project.

21.2.5 Evaluation of significance

Potential negative impacts during project construction and operation have been considered (see Table 21-2). The level of significance was determined with consideration of the sensitivity of the existing environment and magnitude of impact compared to the baseline condition. For the methodology adopted, a level of significance has only been assigned to potential negative impacts. Appendix U (Technical working paper: Socio-economic assessment) outlines what qualities contribute to the level of sensitivity for a receiver. The magnitude of an impact is dependent on its scale, intensity, spatial extent, duration and scope of works. When 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.

Table 21-2 Assessing the level of significance

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

21.3 Existing environment

This section provides an overview of the socio-economic characteristics of the two precinct areas assessed with regards to demographic profiles and housing, social infrastructure, community values, employment centres, and access and connectivity.

The existing environment with regard to traffic and transport, noise and vibration, air quality, human health, land use and property, and urban design and visual amenity are outlined in 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) and Chapter 22 (Urban design and visual amenity).

21.3.1 Demographic profile

Table 21-3 provides a summary of the demographic profile of the precinct areas. This information has been sourced from the ABS Census 2016.

Table 21-3 Demographic information for precincts

Characteristics	South Harbour Precinct	North Harbour Precinct
Population by age	<ul style="list-style-type: none"> Population of about 59,540 in 2016 Annual average growth of 1.4 per cent (2011-2016) Lower proportion of residents 65 years and older (about 12 per cent) when compared to Greater Sydney (about 14 per cent) A higher proportion of residents within the young working family of 15-64 years (about 70 per cent) when compared to Greater Sydney (about 67 per cent) Equal proportion of residents under the age of 14 years when compared to Greater Sydney – both about 18 per cent. 	<ul style="list-style-type: none"> Population of about 111,217 in 2016 Annual average growth of 1.3 per cent (2011-2016) Higher proportion of residents 65 years and older (about 15 per cent) when compared to Greater Sydney (about 14 per cent) A higher proportion of residents within the young working family of 15-64 years (about 70 per cent) when compared to Greater Sydney (about 67 per cent) A lower proportion of residents under the age of 14 years (about 14 per cent) when compared to Greater Sydney (about 18 per cent).
Cultural diversity	<ul style="list-style-type: none"> About 28 per cent of precinct residents were born overseas and 15.3 per cent of people spoke a language other than English Greater Sydney recorded a higher proportion of people born overseas (about 36.8 per cent) and a higher proportion of people who spoke a language other than English (about 35.8 per cent). 	<ul style="list-style-type: none"> About 37.1 per cent of precinct residents were born overseas and 21.1 per cent of people spoke a language other than English Greater Sydney recorded a lower proportion of people born overseas (about 36.8 per cent) and a higher proportion of people who spoke a language other than English (about 35.8 per cent).
Vulnerability/need for assistance	In 2016, 3.4 per cent of residents needed assistance, compared to about 5 per cent for Greater Sydney.	In 2016, 2.4 per cent of residents needed assistance, compared to about 5 per cent for Greater Sydney.
Dwellings	<ul style="list-style-type: none"> In 2016, there were about 23,630 private dwellings, 25.5 per cent of which were apartment-style dwellings, which was similar to the Greater Sydney average (25.9 per cent) Semi-detached houses were the primary form of housing, contributing 48.8 per cent compared to Greater Sydney's 12.9 per cent. 	<ul style="list-style-type: none"> In 2016, there were about 50,178 private dwellings, 60.2 per cent of which were apartment-style dwellings, which was higher than the Greater Sydney average (25.9 per cent) Apartment style dwellings were the primary form of housing.

Characteristics	South Harbour Precinct	North Harbour Precinct
Vehicle ownership	<p>Of occupied private dwellings:</p> <ul style="list-style-type: none"> About 13.2 per cent did not own a vehicle About 49.5 per cent owned one vehicle About 34.5 per cent owned two or more vehicles. 	<p>Of occupied private dwellings:</p> <ul style="list-style-type: none"> About 15.6 per cent did not own a vehicle About 51.9 per cent owned one vehicle About 30.3 per cent owned two or more vehicles.
Income	Higher personal (\$1278 per week) and household median (\$2525 per week) incomes compared to Greater Sydney (\$719 per week and \$1750 per week respectively).	Higher personal (\$1368 per week) and household median (\$2400 per week) incomes compared to Greater Sydney (\$719 per week and \$1750 per week respectively).
Employment	<ul style="list-style-type: none"> Lower rate of unemployment (3.9 per cent) compared to Greater Sydney (6.0 per cent) In 2016, the top four employment industries were: <ul style="list-style-type: none"> Professional, scientific and technical services Health care and social assistance Financial and insurance services Information media and telecommunications. 	<ul style="list-style-type: none"> Lower rate of unemployment (3.7 per cent) compared to Greater Sydney (6.0 per cent) In 2016, the top four employment industries were: <ul style="list-style-type: none"> Professional, scientific and technical services Health care and social assistance Financial and insurance services Information media and telecommunications.
Travel to work	<p>For employed residents within the precinct:</p> <ul style="list-style-type: none"> About 41.4 per cent drove to work in a car as either driver or passenger About 20.5 per cent used public transport to get to work (via rail or bus) About 8.4 per cent used active transport (walked and/or cycled). 	<p>For employed residents within the precinct:</p> <ul style="list-style-type: none"> About 35.1 per cent drove to work in a car as either driver or passenger About 30 per cent used public transport to get to work (via rail or bus) About 10.4 per cent used active transport (walked and/or cycled).

21.3.2 Social infrastructure

Social infrastructure in the precinct areas

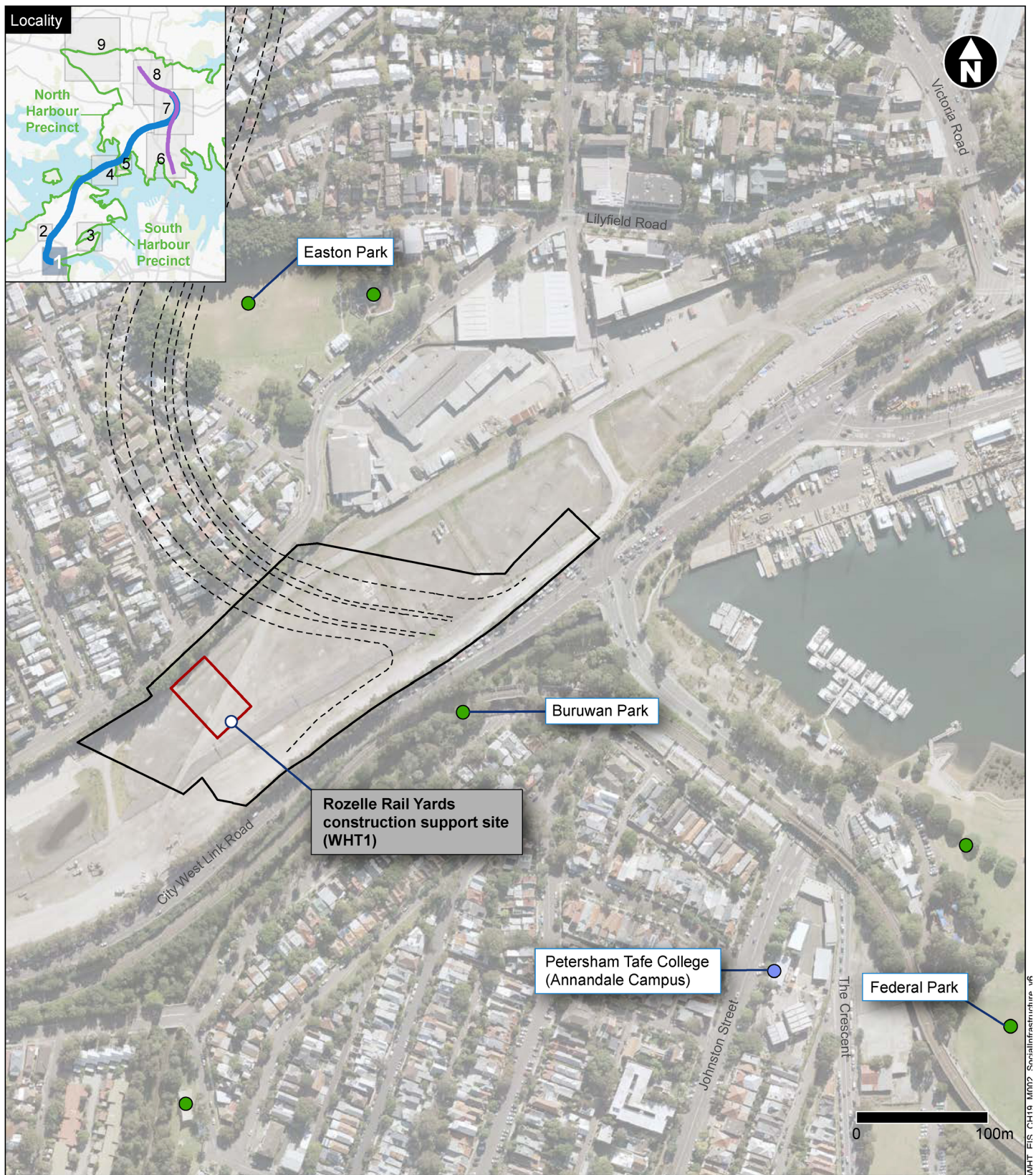
The precinct areas accommodate a wide range of community services and facilities of local and regional importance including education facilities; health, medical and emergency services; sport, recreation and leisure facilities; and community and cultural facilities. Consideration has also been made to social infrastructure within local government areas where required. These include, but are not limited to:

- Major hospitals such as the Balmain Hospital, Mater Hospital at North Sydney, and Royal North Shore and North Shore Private hospitals at St Leonards

- Tertiary education facilities, including the University of Tasmania Sydney Campus at Rozelle, University of Sydney – Sydney College of the Arts, multiple TAFE NSW campuses and the Australian Catholic University North Sydney Campus
- Local and regional sport and recreation facilities, such as Callan Park, St Leonards Park, Balls Head Reserve, Birchgrove Park, Yurulbin Park and Waverton Park
- Major retail, commercial uses, cultural and community support facilities located within the Inner West, North Sydney, Mosman and Willoughby local government areas.

Social infrastructure near the project

Social infrastructure located near surface works and construction activities is shown in Figure 21-3 to Figure 21-11.



Legend

Construction features

- Tunnel section
- ▭ Construction footprint
- ▭ Construction support site

Social infrastructure

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

Figure 21-3 Social infrastructure near the project (map 1)



Legend

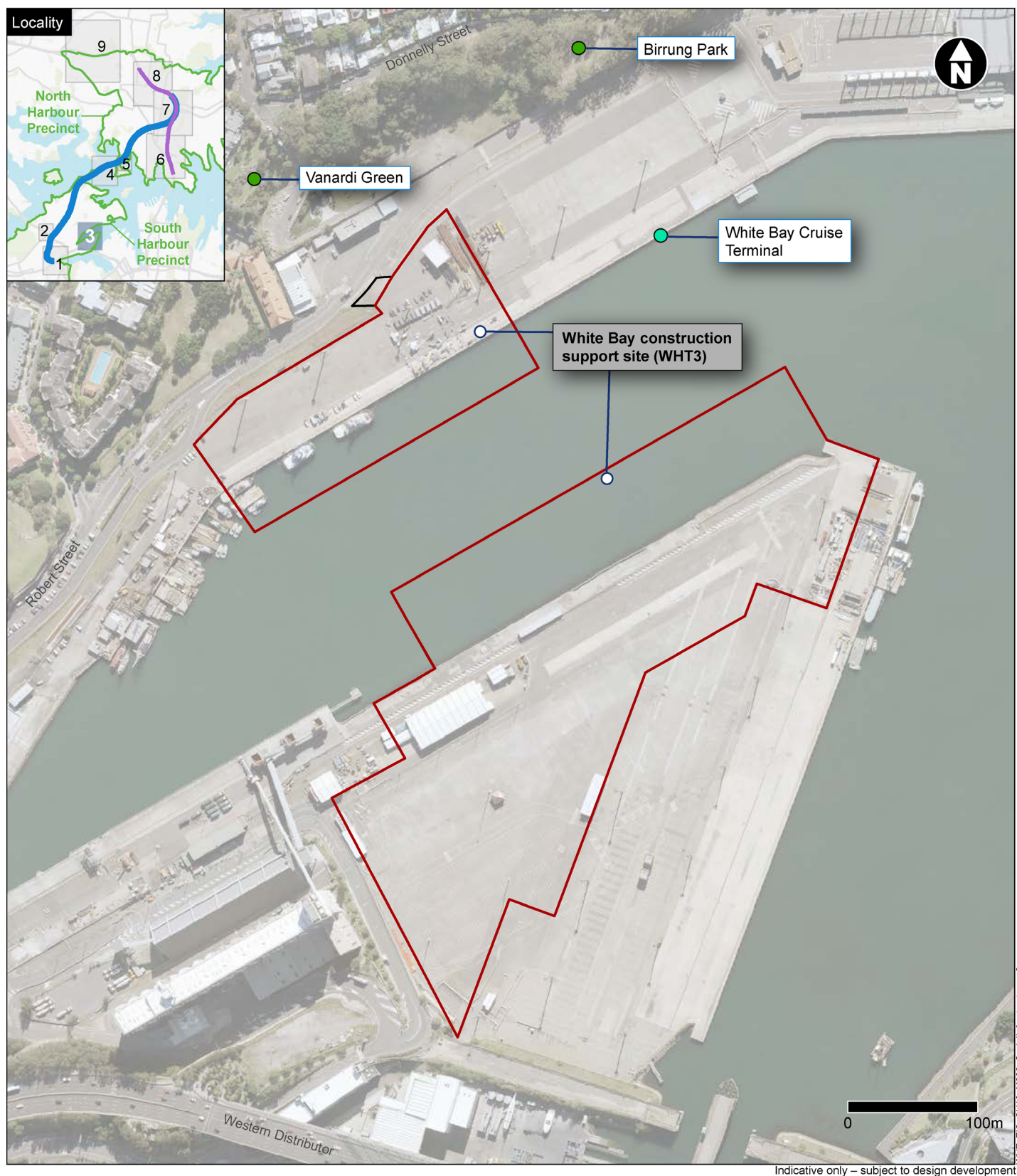
Construction features

- Tunnel section
- Construction footprint
- Construction support site

Social infrastructure

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

Figure 21-4 Social infrastructure near the project (map 2)



Legend

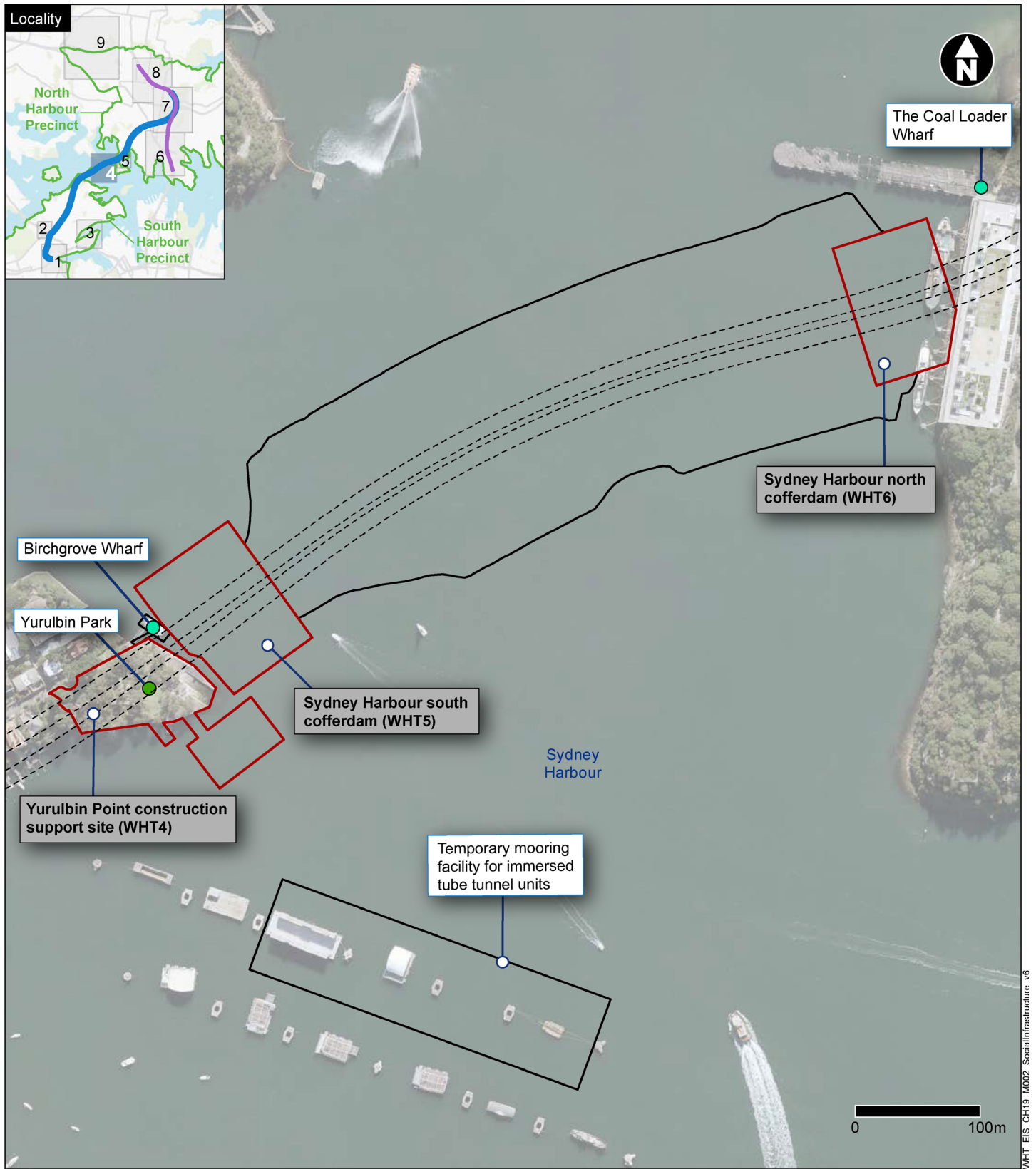
Construction features

- Tunnel section
- Construction footprint
- Construction support site

Social infrastructure

- Sport, recreation and leisure facilities
- Wharf

Figure 21-5 Social infrastructure near the project (map 3)



Indicative only – subject to design development

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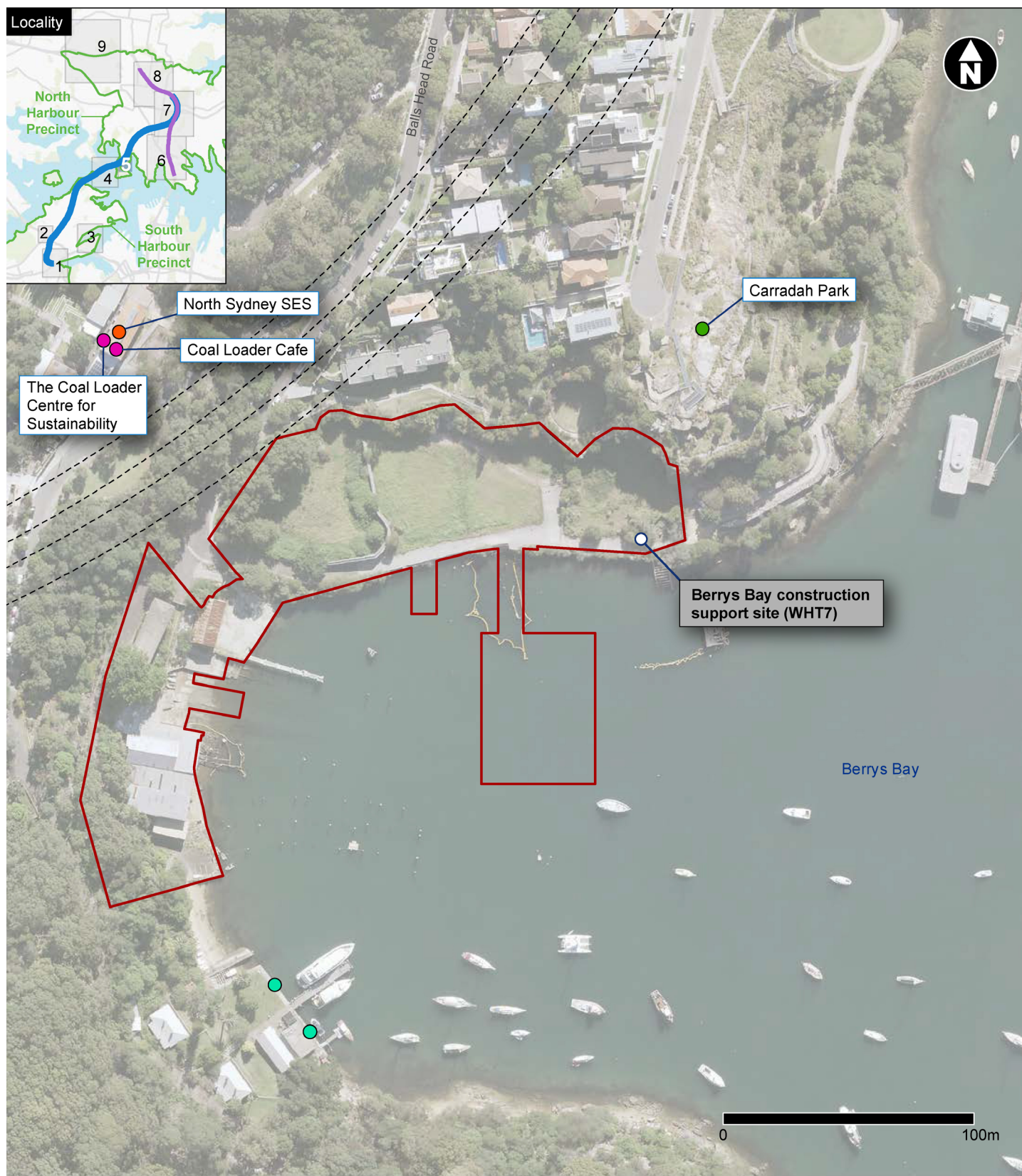
Construction features

- Tunnel section
- Construction footprint
- Construction support site

Social infrastructure

- Sport, recreation and leisure facilities
- Wharf

Figure 21-6 Social infrastructure near the project (map 4)



Legend

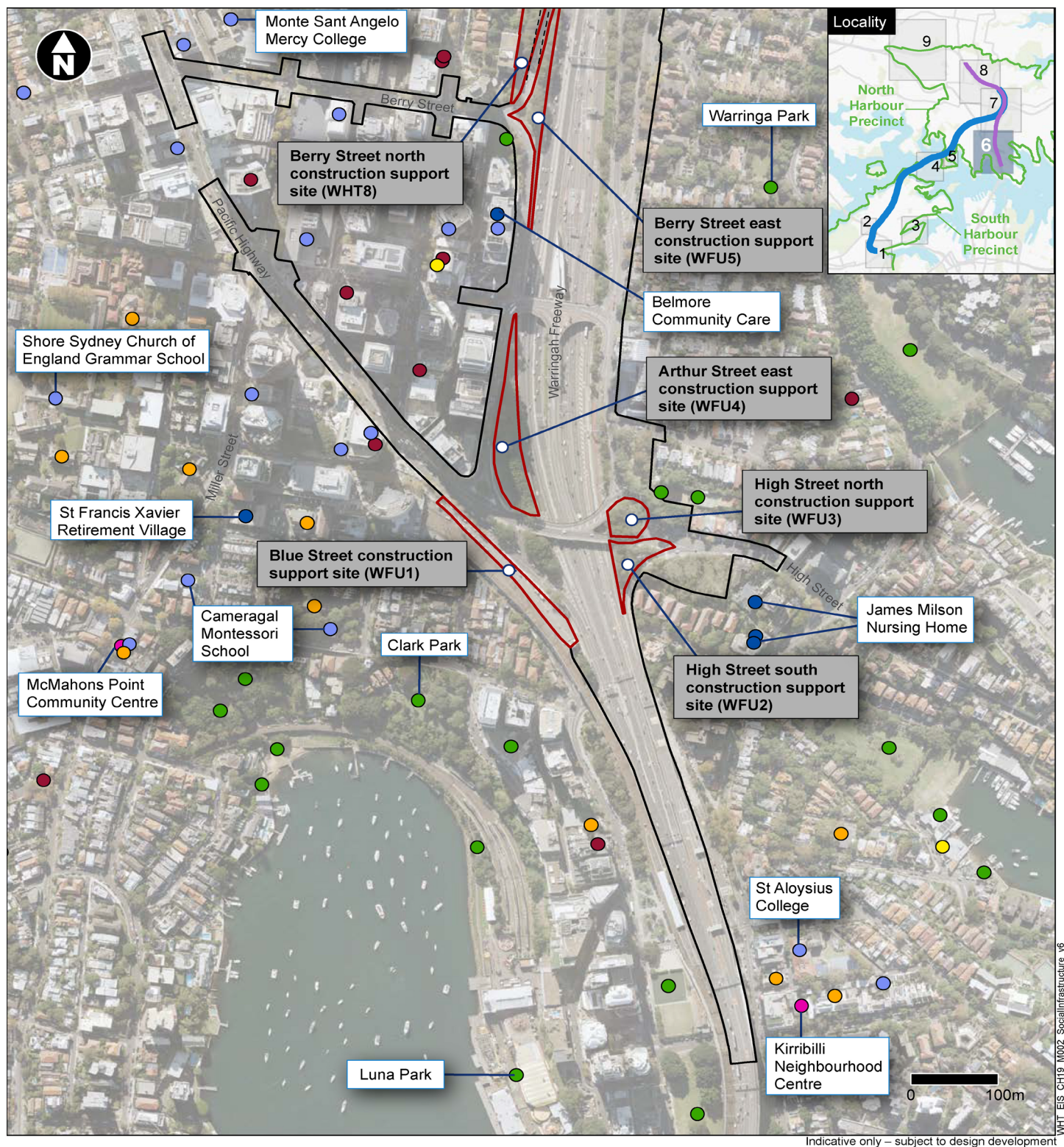
Construction features

- Tunnel section
- Construction footprint
- Construction support site

Social infrastructure

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

Figure 21-7 Social infrastructure near the project (map 5)



Legend

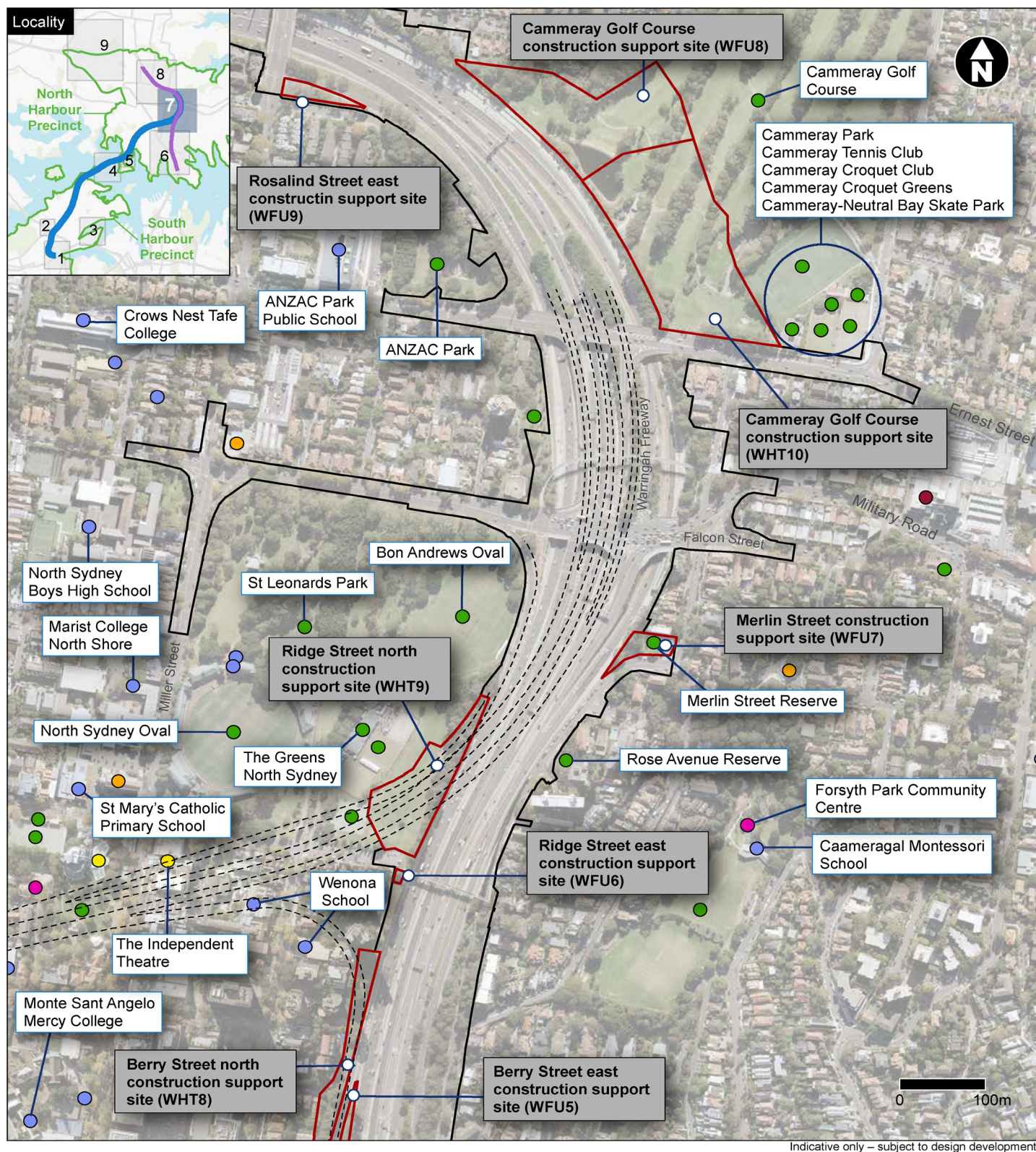
Construction features

- Construction footprint
- Construction support site

Social infrastructure

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

Figure 21-8 Social infrastructure near the project (map 6)



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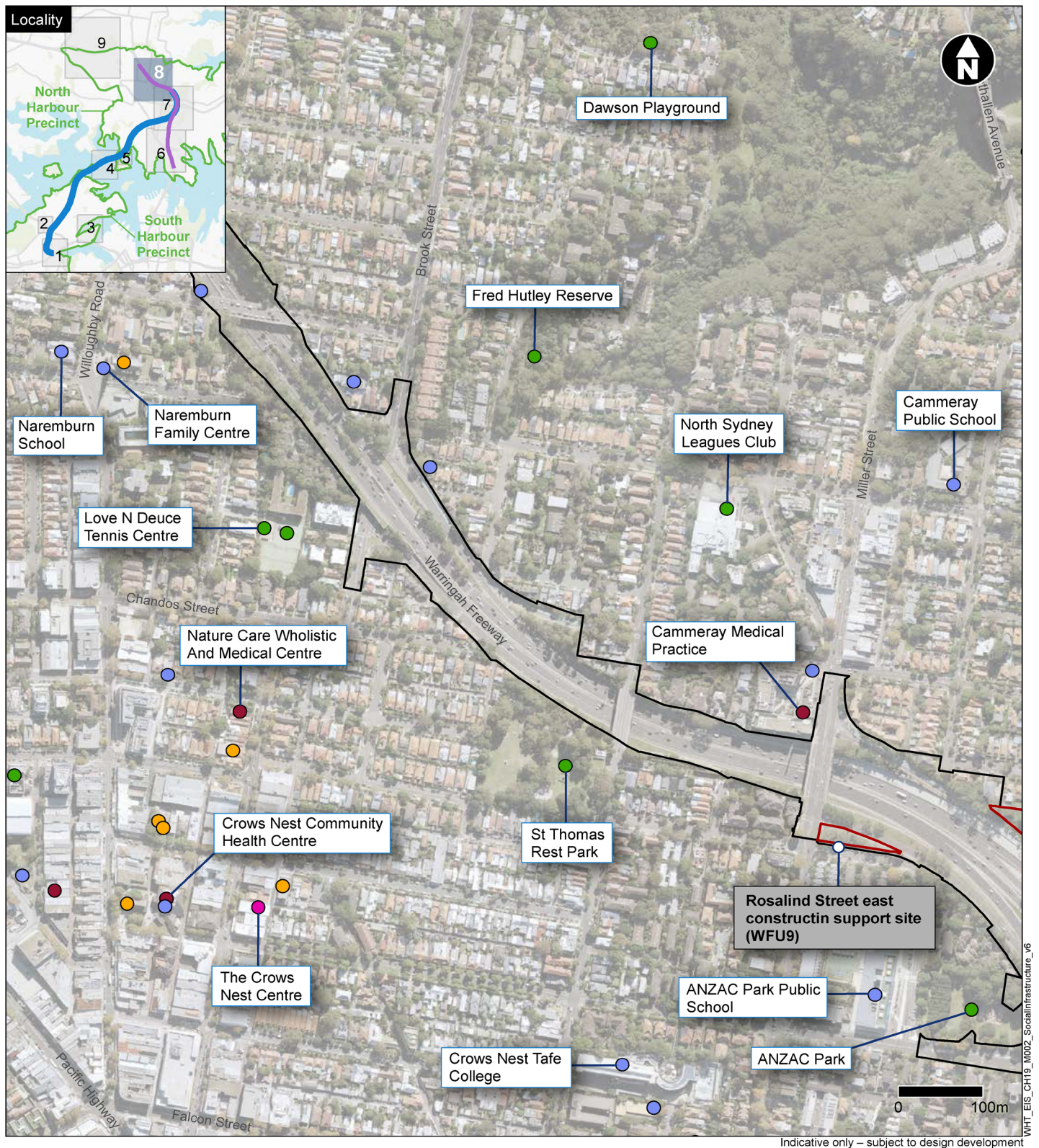
Construction features

- 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 21-9 Social infrastructure near the project (map 7)



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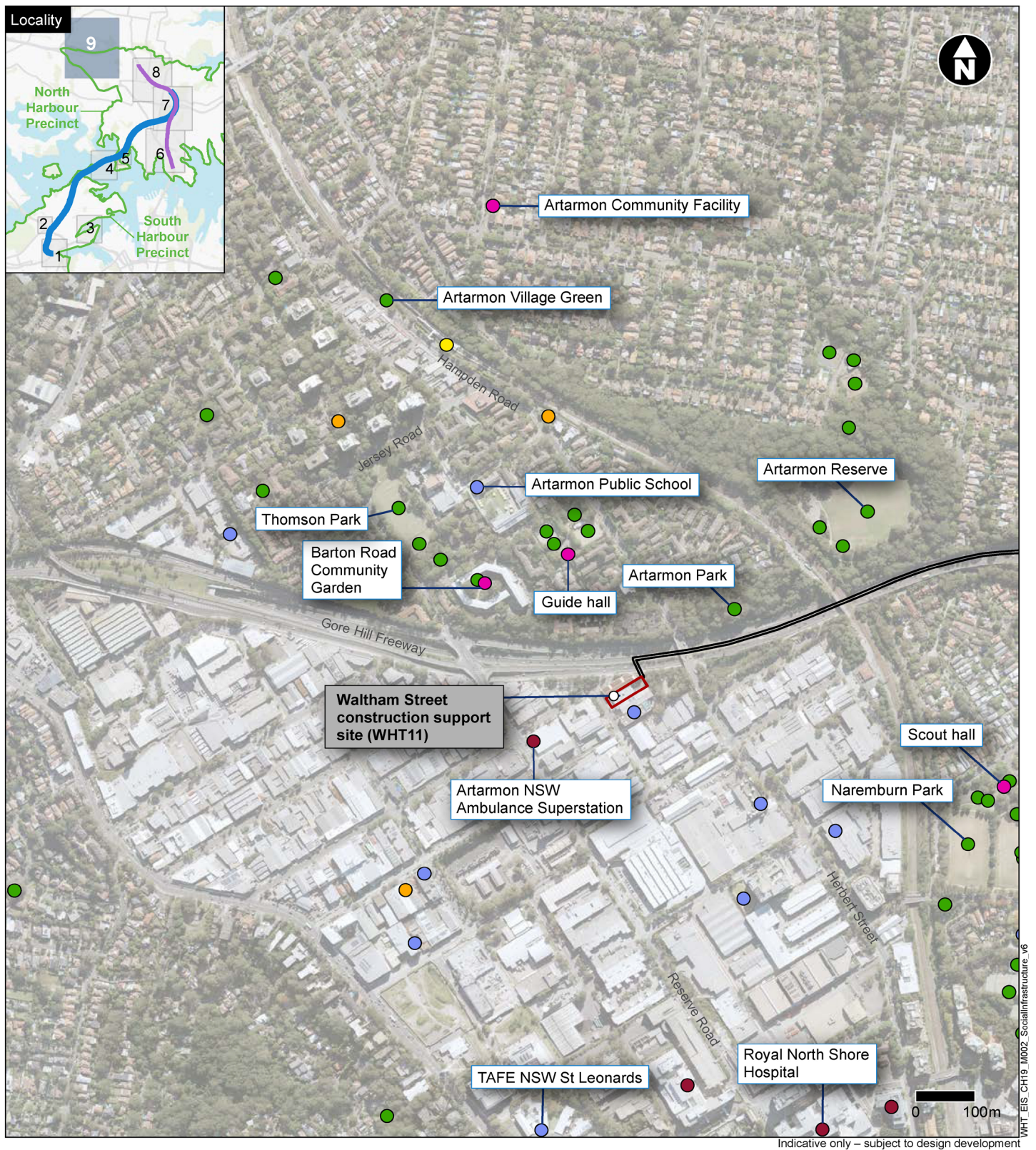
Construction features

- 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 21-10 Social infrastructure near the project (map 8)



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 21-11 Social infrastructure near the project (map 9)

21.3.3 Community values

This section provides an overview of those values or features within the precinct areas that are likely to be important to local and regional communities within Greater Sydney. This has been informed by the review of existing literature (including 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 precinct areas.

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 (such as existing noise levels and air quality), and heritage and cultural features.

Local amenity and character in the precinct areas are generally characterised by a diversity of land and water-based uses including:

- Predominantly residential neighbourhoods within the South Harbour Precinct, such as at Lilyfield, Balmain, Rozelle and Birchgrove
- Industrial and maritime uses at Rozelle Bay and White Bay. Port facilities, such as the White Bay Cruise Terminal and Glebe Island, are also located within this area
- 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
- Major social infrastructure such as hospitals (including 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)
- Parks and recreational facilities, such as Cammeray Golf Course and St Leonards Park
- Open space areas, reserves and parks that are valued by local and regional communities for their landscape amenity, heritage and recreational values. These include Sydney Harbour National Park, Yurulbin Park, Birchgrove Park, Callan Park, St Leonards Park, ANZAC Park, Balls Head Reserve, and Waverton Park
- Water based recreational activities and sporting clubs based on Sydney Harbour
- Major events on Sydney Harbour, including the Sydney New Years' Eve fireworks, Australia Day celebrations, Sydney to Hobart yacht race, Chinese New Year celebrations and Vivid Sydney
- Tourist attractions, such as Luna Park.

Community cohesion

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

Community cohesion is also encouraged by connectivity or discouraged by barriers to movement. The existing scale of the Warringah Freeway creates a barrier between adjoining areas, reducing east-west connectivity for pedestrians and traffic as described in Chapter 20 (Land use and property).

Community and social networks are associated with social infrastructure such as schools, places of worship, 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 precinct areas host a variety of local events, including festivals, exhibitions and markets. These provide opportunities to involve local communities and for residents to connect with and participate in community life, helping to foster a sense of community and local identity. These include:

- Local 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
- New Year's Eve, Chinese New Year and Australia Day celebrations
- Community volunteering programs, for example opportunity for community volunteering at the former coal loader and opportunities with the Balls Head Reserve Bushcare Group
- Weekly and monthly farmer's markets and arts markets, including at Rozelle, Crows Nest, Kirribilli, and North Sydney.

Community health and wellbeing

Maintaining a high level of community safety and ensuring people feel safe in public places is likely to be important to communities in the precinct areas, with concerns regarding 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. Air quality during the operation of the project and potential impacts for local communities, schools and park users near to tunnel portals and ventilation outlets have been raised by the community. In particular, concerns were related to the location of the tunnel portals and ventilation outlets and potential air quality impacts for school students and users of open space areas.

21.3.4 Business profile

Business centre profiles

A hierarchy of centres has been applied to the area based largely on work in the *Greater Sydney Region Plan* by the Greater Sydney Commission. North Sydney forms part of the Harbour CBD metropolitan area and St Leonards is a strategic centre. There are several local centres within the precincts. These are generally clustered on the main transport routes (such as rail corridors or bus routes) and provide either a specialist service to the broader area or a convenience service for the local community. Some business centres are within the precinct areas for the Beaches Link and Gore Hill Freeway project. A summary of businesses within business centres within each precinct is provided in Table 21-4. Businesses that operate outside of business and industrial zones have not been overviewed in the existing environment, however, have been considered in the assessment of impacts (refer to section 21.4.7 and 21.5.6).

Table 21-4 Summary of businesses within business centres

Centre	General description
South Harbour Precinct	
Catherine Street Centre, Lilyfield	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, Rozelle	Businesses on Victoria Road comprise a variety of retail and personal medical services. Businesses on 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, Rozelle	The Robert Street Industrial Centre comprises industrial businesses including a number of automotive, construction-related retail and storage businesses. A number of 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, as these businesses are destination services.
James Craig Road Working Waterfront, Rozelle	<p>This waterfront cluster is comprised of a number of maritime related businesses, including dry storage, slipways, harbour cruises, government agency (Transport for NSW), public marina berths as well as supportive food services such as cafes.</p> <p>White Bay Cruise terminal is at this centre. The Terminal is also utilised 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 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 businesses 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 a number of maritime businesses, including yacht charter companies and boat repair and storage

Centre	General description
	facilities. Businesses located in the cluster are a specialist business and do not rely on passing trade.
Miller Street Centre, Cammeray	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 service a neighbourhood catchment as well as those visiting for work.
Kirribilli Centre	Kirribilli Centre contains a school, church, convenience retail stores, various food and drink retailers and neighbourhood shops, including a florist, convenience store and post office. The cluster caters primarily to a neighbourhood catchment.
Bay Road Centre, Waverton	This centre contains a church and a small number of neighbourhood businesses (for example, convenience store, chemist, butcher, restaurants and a cafe). 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 has 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 Centre, Cremorne	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) and 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.

Maritime businesses

Businesses reliant on Sydney Harbour for operation include:

- 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, tow 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.

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. Cruise ship movements in 2018 were in excess of 230 for the Overseas Passenger Terminal at Circular Quay and 120 for the White Bay Cruise Terminal at Balmain. A number of moorings are also available for commercial use throughout Sydney Harbour.

Businesses assessed

Businesses within the precinct areas are generally clustered on the main transport routes and provide either a specialist service to the broader area or a convenience service for the local community. The location of the business centres in proximity to the project are shown on Figure 21-12. The location of construction support sites are also shown as businesses within close proximity who may experience impacts. The precinct areas also contain a wide variety of businesses located outside of a business centre. The top three industries of employment are professional, scientific and technical services; health care and social assistance; and financial and insurance services.

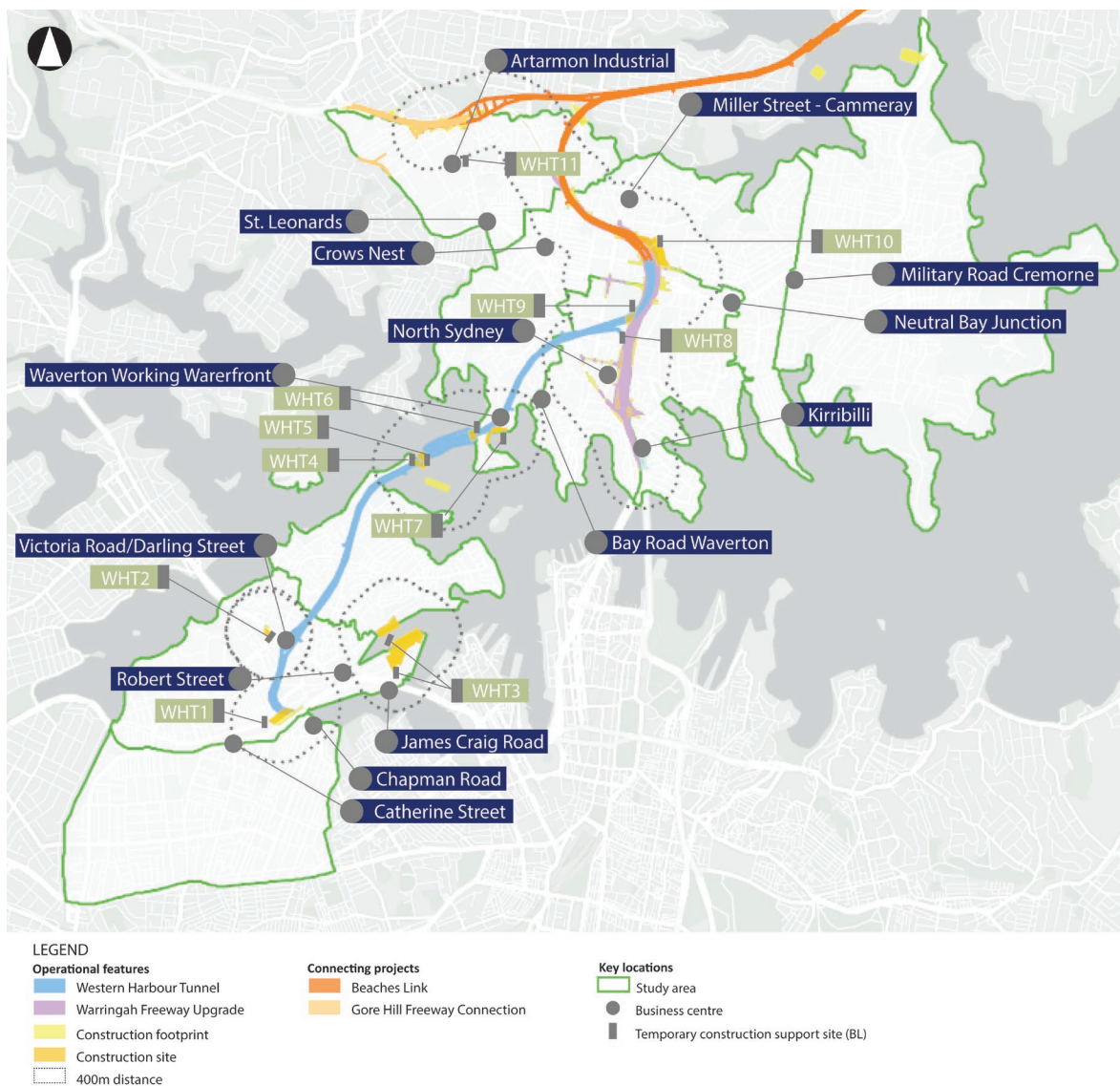


Figure 21-12 Business centres

Business surveys results

Business survey results revealed that businesses in the area have varying degrees of sensitivity and dependency to project construction and operational aspects. Generally, there was a high dependency (75 per cent) on vehicular passing trade, with 43 per cent of businesses surveyed majorly dependent. Eighty-four per cent of surveyed businesses perceived a dependency on pedestrian and cyclist passing trade, with 66 per cent 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. Permanent or long-term changes in access to a centre, for example through changes in travel times (increases or decreases), may result in long-term changes to consumer and worker behaviour. The business survey found that 80 per cent of businesses perceived that they were sensitive to travel time delays, with 45 per cent of the respondents perceived to be majorly sensitive.

The majority of customers and employees use private vehicles as their primary transport mode. During construction, 64 per cent of businesses surveyed perceived construction of the project would have no discernible positive or negative effects on travel time and access, however upon operation half of business respondents perceived that the project would be positive for employee and customer access. Convenient customer parking was considered a dependency for 74 per cent 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 businesses recording major dependencies. For deliveries and loading arrangements, the impact was considered by businesses to be neutral or positive with 64 per cent of businesses perceiving 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.

There is potential for reduced exposure due to changes in pedestrian or vehicle routes and traffic volumes. Ninety one per cent of businesses indicated that they were dependent on business exposure and visibility with 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 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 perceived 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.

21.3.5 Access and connectivity

A detailed description of the existing traffic and transport environment surrounding the project is provided in Chapter 8 (Construction Traffic and transport).

Road network

A number of major roads are located near the project that provide access for communities to employment and infrastructure within the precinct areas as well as for communities in the Greater Sydney region. Major roads near the project include:

- City West Link, which passes through 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 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 North Sydney, Crows Nest, St Leonards, and on to other centres in the northern suburbs of Sydney
- Falcon Street/A8 Military Road, which connects Crows Nest, Mosman and the Northern Beaches.

At the 2016 Census, car travel was the predominant mode of travel to work for residents in the precinct areas, with about 38 per cent of people aged 15 years or over using a car for all or part of their journey to work.

Public transport

Public transport modes across the precinct areas include rail, bus and ferry services:

- The northern precinct area is serviced by railway stations located near the project footprint at Milsons Point, North Sydney, Waverton, Wollstonecraft and St Leonards
- The southern precinct area is serviced by the Dulwich Hill Light Rail
- There are multiple bus corridors within the precinct areas that use major roads such as Warringah Freeway, Military Road, Pacific Highway, Miller Street and Victoria Road and ANZAC Bridge
- Ferry route F3 Parramatta River line operates between Circular Quay and Parramatta, and route F8 Cockatoo Island operates between Circular Quay and Cockatoo Island. Balmain East wharf is also serviced by the F4 Cross Harbour line.

At the 2016 Census bus transportation was the second preferred mode of transport across the precinct areas after travel by car, carrying about 17 per cent of residents, followed by rail with about 10 per cent. At the 2016 Census, about 2622 people living in the precinct areas 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.

Further details for public transport services in the precinct areas are included in Chapter 8 (Construction traffic and transport).

Active transport

In 2016, walking and cycling were both common forms of active transport for commuters across the precinct areas, with about 10 per cent of residents walking or cycling to work. A number of shared user paths are located in the precinct areas, including separated off-road dedicated cycleways and dedicated on-road cycling lanes.

The pedestrian network in the Warringah Freeway and North Sydney area is well-developed with footpaths provided alongside the vast majority of roads and controlled crossings provided at most signalised intersections. Pedestrians are prohibited from walking along the Warringah Freeway. Significant pedestrian activity associated with retail and commercial land uses occurs within North Sydney CBD, and also in the vicinity of the numerous schools located west of the Pacific Highway and along Miller Street. Balls Head Reserve is also a significant generator of pedestrian activity associated with people carrying out exercise activities. The Warringah Freeway presents a barrier to east-west movements for pedestrians and cyclists, with crossings available at select locations including:

- 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 pedestrian network in the Rozelle area is also well-developed with footpaths provided alongside the vast majority of roads and controlled crossings provided at most signalised intersections. Significant pedestrian activity associated with the Rozelle and Balmain local town centre occurs along Victoria Road and Darling Street. 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.

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

- Victoria Road between The Crescent 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.

Maritime transport

Maritime transport within Sydney Harbour includes cruise and tanker traffic, commercial fishing, water taxis, charter companies and boat storage facilities, government maritime traffic (including ferries and the Royal Australian Navy maritime traffic). Further detail on maritime transport as well as navigation restrictions in Sydney Harbour are discussed in Chapter 8 (Construction traffic and transport).

21.4 Assessment of potential construction impacts

Construction of the project would have the potential to affect the social and economic environment of the precinct areas. These potential impacts are assessed in this section.

21.4.1 Property impacts and acquisition

The project has been designed to minimise the need for surface property acquisition. This has been done by locating road infrastructure in tunnels and, where possible, using government-owned land for construction and operation of the project. Nonetheless, some property acquisition would be required to facilitate construction of the project.

Property acquisition and temporary leases

The project would require the acquisition or temporary use of 28 properties. Temporary leases of land would also be required for construction support sites and other construction works. The nature of direct property impacts, including details of property acquisitions and temporary occupation of land, is discussed further in Chapter 20 (Land use and property).

Some residents and communities near the project may experience a level of stress and anxiety due to uncertainty about potential property impacts, property acquisition and proposed changes that may be associated with the project. These concerns were raised by community members during consultation for the project.

Sixteen residential properties would be wholly acquired for the project, requiring affected households to relocate prior to construction. 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.

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

The sensitivity of affected individuals and households are considered to be high. However, 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.

Other property impacts

The main tunnels would pass beneath a large number of properties, including residential, commercial and industrial uses and social infrastructure properties. Potential impacts of tunnels on the use of properties and future development potential was raised during community consultation for the project. Under the (NSW) *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 occurs 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 along the alignment. 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. 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.

Concerns were raised during community and stakeholder engagement about potential for property damage, including to basement car parks, unit developments and pools, due to vibration from tunnelling activities. During construction, some properties located 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 would generally be below levels that may cause potential risk to buildings or structures, including minor cracking. However, there is potential for cosmetic damage risks to a small number of properties closest to vibration intensive construction activities. Further discussion about potential vibration impacts on buildings and structures is provided in Chapter 10 (Construction noise and vibration).

The excavation of tunnels also has potential to result in settlement at the ground surface, potentially impacting properties above or near the project. Some properties near the project may experience very slight to slight cosmetic damage due to settlement, although this is not expected to impact on the serviceability or stability of buildings which is discussed in Chapter 16 (Geology, soils and groundwater). 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.

21.4.2 Equity

Equity refers to a fair distribution of the resources that allow residents full participation in their community. Equity requires that the well-being of people with fewer resources is protected. Changes to conditions which may affect equity in the precinct areas include impacts to amenity, liveability, access and connectivity.

During construction, it is anticipated that impacts to equity would be more acutely experienced by those communities closest to surface works, construction support sites, or occupants of properties above the tunnel alignment. Potential equity impacts would mainly relate to construction noise, dust and vibration affecting the amenity and liveability of the area, as well as changes in local access and connectivity. These impacts would be relatively short-term and localised to discrete locations as construction activities at each construction support site would be comparatively less than the overall construction program. 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.

21.4.3 Population and demography

The construction workforce would generally be sourced from across the Greater Sydney region and would not change population and demography in the precinct areas.

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.

Further information on property acquisition as a result of the project is provided in Chapter 20 (Land use and property) and discussed in Section 21.4.1.

21.4.4 Social infrastructure

During construction, potential impacts on social infrastructure in the precinct areas may result from:

- Loss of open space, parks and recreational facilities, due to use for construction support sites and permanent project facilities
- Reduced visual amenity and increased air-borne construction noise, dust and traffic, impacting on amenity for users of some social infrastructure
- Ground-borne noise and vibration from construction of the 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 to proposed works.

Directly impacted social infrastructure

Social infrastructure would be directly impacted through the use of land for construction support sites and project infrastructure. In particular, impacts would include:

- Temporary use of parks and open space areas for construction support sites, resulting in the temporary loss of access to, and use of, land within the construction footprint
- Permanent loss of some open space at Cammeray Golf Course
- Reduced amenity due to location of construction works and construction support sites, detracting from the use and enjoyment for people using the remaining parts of the social infrastructure.

Table 21-5 provides a summary of potential impacts on social infrastructure directly impacted by the construction of the project.

Table 21-5 Direct impacts on social infrastructure

Social infrastructure	Summary of potential impacts
Yurulbin Park and Birchgrove Wharf	<p>The use of the park as a construction support site (Yurulbin Point - WHT3) would result in the temporary loss of access to, and use of, land within the construction footprint, which is assessed as of high-moderate significance. 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. Construction 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. Impacts to Birchgrove Wharf would be temporary for the duration of construction at Yurulbin Point construction support site (WHT3). Yurulbin Park is also a popular vantage point for New Year's Eve celebrations on Sydney Harbour. Alternative informal recreation facilities are located at Birchgrove Park, Elkington Park, Ballast Point Park and Mort Bay Park.</p> <p>The project would require the clearing of some established trees within the park for construction, however, 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. This impact is likely to diminish over time as new landscaping planted as part of the site rehabilitation becomes established. There would also be an increase in the amount of built form visible and a perceptible decrease in vegetation at the end of the Birchgrove peninsula, with high temporary visual impacts expected for users of Yurulbin Park. The park would be rehabilitated in line with the design vision provided by the original landscape architect, Bruce Mackenzie AM.</p> <p>Heritage, biodiversity and visual impacts on Yurulbin Park are discussed in Chapter 14 (Non-Aboriginal heritage), Chapter 19 (Biodiversity) and Chapter 22 (Urban design and visual amenity) respectively.</p>
St Leonards Park	<p>There would be temporary loss of access to, and use of, a portion of land within St Leonards Park associated with the Ridge Street north construction support site (WHT9) which has been assessed as of high-moderate significance. 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. Previous consultation has identified open space, trees and greenery and quietness to be important values of St Leonards Park to the local</p>

Social infrastructure	Summary of potential impacts
	<p>community. 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 and Bon Andrews Oval due to their proximity to construction works. Increased construction traffic and the presence of construction works may also impact on perceptions of safety for park users.</p>
Rose Avenue Reserve	<p>During construction, increased noise, dust and construction traffic may impact on the amenity of the reserve for some users. This reserve has very limited recreational values 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.</p>
Merlin Street Reserve, Neutral Bay	<p>Merlin Street Reserve would be used as a construction support site (WFU7) to support the Warringah Freeway Upgrade. Construction of the project would require the temporary closure of the reserve which has been assessed as of low significance, with the sensitivity of the reserve to impacts and the magnitude of the impact considered low. 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. Following construction, the reserve would be rehabilitated and reinstated and would be available for ongoing informal recreation uses.</p>
Camberay Golf Course	<p>Impact on land within Cammeray Golf Course would result from the establishment of a construction support site (WHT10/WFU8) and infrastructure required for the project and has been assessed as of moderate-high significance. 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. The impacted section of the golf course adjoins the Warringah Freeway corridor and Ernest Street. Construction and longer term operation of the motorway facilities and other project support infrastructure 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 amenity and use of the golf course for some members.</p> <p>During construction, increased noise, dust and construction traffic may potentially impact on the amenity of the golf course. The implementation of safeguards and management measures would assist in managing potential impacts.</p> <p>After construction, areas of the golf course not required for permanent project infrastructure would be reinstated and rehabilitated, including replacement trees and landscaping. Refer to Chapter 22 (Urban design</p>

Social infrastructure	Summary of potential impacts
	and visual amenity) for an assessment of landscape and visual amenity impacts on Cammeray Golf Course.
Jeaffreson Jackson Reserve	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. 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 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.
ANZAC Park, Cammeray	<p>Construction of the project would require the temporary lease of land within ANZAC Park. The affected area would include grassed areas and vegetation and has been assessed as of moderate-low significance, given the sensitivity of the park to impacts is expected to be moderate and the magnitude of the impact is considered low. Construction would result in the temporary loss of access to and use of land within the construction footprint, temporarily disrupting the use of the affected land for informal recreation. Access would be maintained to other areas within the park for these activities. Following construction, land would be reinstated and is not expected to impact on the long-term use of ANZAC Park.</p> <p>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 of park users and discourage some people from accessing the park. Consideration of community events, such as ANZAC Day services at the memorial statue, in the planning of major construction activities would 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 desire to retain all trees in the park identified through community consultation for the project. Refer to Chapter 22 (Urban design and visual amenity) for an assessment of landscape and visual amenity impacts on ANZAC Park.</p>
ANZAC Avenue Reserve, Cammeray	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.

Indirectly impacted social infrastructure

During construction, impacts on amenity may be experienced by some users of social infrastructure near the project due to the presence of construction infrastructure, increased traffic, (including increased heavy vehicle movements) and construction noise and dust. Changes in amenity can affect how users interact with or enjoy an environment or their ability to participate and concentrate. A reduction in the enjoyment or convenience of social infrastructure access may also deter users and potentially impact on community participation levels, which would have an impact on community values.

A number of schools and childcare facilities would be located near the project (refer Figure 21-3, Figure 21-4 and Figure 21-8 to Figure 21-11). Students, teachers and visitors at the schools may experience temporary amenity impacts due to increased noise and dust from construction activities at construction support sites and surface road upgrades.

Construction activities at the Victoria Road construction support site (WHT2) at Rozelle would have the potential to impact on the amenity of nearby social infrastructure such as Rozelle Public School. During construction there is potential to affect the use of outdoor areas along Victoria Road. Impacts to Wenona School at North Sydney may also occur during the most noise intensive construction activities associated with Ridge Street east construction support site (WFU6) for the widening of Warringah Freeway and Ridge Street pedestrian bridge. Potential noise impacts for attendees of ANZAC Park Public School and North Sydney Boys are generally expected to be low due to the distance between the main construction works and the school buildings.

Construction works at Ridge Street north construction support site (WHT9) and for the widening of Warringah Freeway are also expected to have noise impacts on two child care centres at Berry Street. Noise impacts are also expected at the Independent Theatre at Miller Street during out of hours works. 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.

Construction activities for the Warringah Freeway Upgrade would also be located near to the James Milson Village (nursing home and retirement village) at Clark Road, North Sydney. Temporary impacts may be experienced by residents of the nursing home and retirement village due to noise, vibration and dust from construction activities and increased construction traffic, particularly at night when most of the Warringah Freeway upgrade activities would take place. Some residents of these facilities may be more sensitive to effects of construction noise, 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.

Short-term impacts on amenity may also be experienced for users of some social infrastructure located above or near to the tunnel alignment due to short-term vibration and ground-borne noise impacts from tunnelling. 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 Court House, The Coal Loader Centre for Sustainability at Waverton, North Sydney Stanton Library
- Educational uses such as North Sydney Public School, and Wenona School.

Some users may notice ground-borne noise and vibration for a short period as works occur beneath or near to the property. Potential impacts would be managed through ongoing consultation with managers and users of these facilities. Further information about potential noise and vibration impacts are discussed in Chapter 10 (Construction noise and vibration). 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.

Temporary changes to local access and connectivity for motorists, pedestrians, cyclists and public transport users may impact on access to social infrastructure near to the project. A number of schools and child care centres are located near to surface works and construction support sites at Rozelle, North Sydney, Cammeray and Artarmon. Increased construction traffic may impact on perceptions for safety for children and students (refer to Section 21.4.5). The implementation of safeguards and management measures would assist in managing potential impacts.

21.4.5 Community values

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

- Temporary adverse changes in local amenity for residents, businesses, facilities and natural areas near construction support sites and surface works due to noise and dust 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.

Local amenity and character

Noise, dust, vibration, traffic, and visual impacts from construction activities may temporarily impact on the amenity for some residents and social infrastructure closest to surface works. Impacts on night-time amenity due to construction noise and vibration and light spill may also be experienced should works need to be carried out outside of standard day-time hours. This may impact on night-time amenity or sleeping patterns for some residents. These impacts would be short-term and may potentially impact on the use and enjoyment of some homes, businesses, facilities and natural areas, particularly of outdoor areas.

Sydney Harbour provides a range of formal and informal recreational opportunities to both local and regional communities (including tourists). Sydney Harbour would experience visual and noise impacts during construction activities at locations near to the construction of the cofferdams. Visual and noise impacts during construction may disrupt or reduce the use and enjoyment of areas of the harbour and harbour front for some people in areas near to construction activities. This includes formal and informal recreational users.

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.

Community cohesion

The project construction phase has the potential to result in impacts on community cohesion within the precinct areas by temporarily restricting access to some social infrastructure and meeting places, such as Yurulbin Park, and impacting on amenity, such as Cammeray Golf Course. This

may reduce opportunities for social and community interaction, temporarily impacting on community cohesion. Increased construction noise, dust and traffic may impact on the amenity of the golf course for some users and may deter some people from using the golf course during the construction phase. This has potential to disrupt some social networks associated with the golf club. 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.

Community health and wellbeing

Some areas near construction support sites and along the Warringah Freeway are expected to 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 result in sleep disturbance for some residents and occupants of buildings nearest to these works, potentially impacting health and wellbeing for some individuals. Underwater noise from some construction activities within Sydney Harbour has potential to cause sound pressure levels that may potentially affect people diving or swimming (refer to Chapter 13 (Human health)).

The potential for construction dust to impact on health and wellbeing of some sections of the community who may be more sensitive to changes in air quality (such as children or elderly people who suffer asthma or similar conditions), is likely to be of concern for some community members near to construction activities, for example for residents of the James Milson Village (nursing home and retirement village).

Increased construction traffic and heavy vehicles using Ernest Street and Ridge Street could impact upon the perceptions of safety. For example, 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 could also impact upon the perceptions for safety for children and students at Rozelle Public School. Construction traffic will be managed appropriately in accordance with the environmental management measures detailed in Chapter 8 (Construction traffic and transport).

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.

21.4.6 Economics

Employment

During construction, the project would benefit employment through direct employment opportunities on the project and indirect employment opportunities in businesses and industries that support this 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. About 2600 full time equivalent jobs (2000 for Western Harbour Tunnel and 600 for the Warringah Freeway Upgrade) can be expected to be supported during peak construction. Indirect employment opportunities would be generated across local, regional and national businesses in industries that support construction such as manufacturing and services.

The construction workforce would generally be sourced from across the Greater Sydney region. It is expected that there would be capacity within the regional labour force for the project.

Freight and efficiency costs

Increases to travel times directly affect businesses' 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 cause delays and disruptions for road users, including freight. Detours may result in increased traffic on other 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. 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 impacts considered to be moderate.

Refer to Chapter 8 (Construction traffic and transport) for safeguards to manage impacts on transport routes during construction.

21.4.7 Business and industry

Businesses across the precinct areas may be affected during the construction phase by temporary changes in passing trade, access and travel time (for employees, customers, deliveries and/or servicing), parking, serving and deliveries and amenity. Depending on the nature of the business, the actual impact on business revenue may vary (positively or negatively). These impacts may be an inconvenience for some businesses, although they would be temporary in nature as construction activities at each construction support site would be comparatively less than the overall construction program. There may also be benefits for businesses due to increased passing trade and business exposure.

Potential impacts have been assessed for those business centres identified as being most likely to experience direct and indirect construction impacts. Potential impacts at these locations are discussed below. Further information is provided in the business impact assessment in Appendix U (Technical working paper: Socio-economic Assessment).

Passing trade

Passing trade refers to customers who choose to visit a business because they see it when walking, cycling or driving past, not because they planned to go there.

Construction of the project would result in changes to vehicle, pedestrian and cyclist flows that could influence the level of passing trade. Some businesses could benefit due to passing trade being re-directed towards them or due to increases in construction workers in the area. Conversely businesses might be disadvantaged as traffic is diverted away, or as they become less attractive to passing trade due to construction impacts (such as reduced visibility, amenity, ease of access, or parking availability).

Impacts of moderate significance are expected on passing trade at Neutral Bay Junction with both the magnitude of change and level of sensitivity at the centre being moderate. At the North Sydney CBD the level of sensitivity and magnitude of change is expected to be low; as a result the significance of construction impacts on the centre is low. These impacts are generally due to temporary lane closures, detours, surface works and road alterations that would result in people avoiding these centres in favour of more easily accessible locations.

Employee and customer access

The construction phase of the project would result in changes to road, public transport and active transport networks, which may affect employee and customer access. Increased journey times can affect staff recruitment and retention, which may in turn impact on business productivity and function. Similarly, customers may respond to access difficulties and delays by visiting alternative centres that offer similar goods or services, resulting in a loss of trade for affected businesses.

Businesses often rely on parking facilities for deliveries and/or services and parking convenience for workers and customers. Increased demand and competition for car parking could influence customers to drive to an alternative business providing similar goods or services in a more accessible location. A reduction in parking spaces may also impact on visitor numbers to the broader area and therefore reduce opportunities for passing trade. Limitations on business parking could also reduce productivity, employee attraction and retention. For example, there is expected to be removal of parking spaces along the eastern end of Ridge Street to provide suitable access to the Ridge Street north construction support site (WHT9) in the North Sydney CBD. The level of sensitivity of North Sydney CBD and magnitude of change are considered moderate. Overall the significance of impacts for nearby business users is considered moderate.

The traffic and transport assessment (refer to Chapter 8 (Construction Traffic and transport)) identified that road network performance would be affected during construction, with a number of temporary road closures and increased construction traffic resulting in increased travel times in some areas. Impacts on employee and customer access would be experienced by businesses within the Victoria Road/Darling Street Centre and North Sydney strategic centre; overall the significance of impacts at these centres would be moderate. The significance of impacts on employee and customer access experienced by businesses within the James Craig Road Working Waterfront, Chapman Road Working Waterfront and Neutral Bay Junction would be moderate-low. At other business centres, impacts of construction works on access and travel time would be of low significance or negligible impact.

Servicing and deliveries

Businesses rely on deliveries and dispatch of goods to support the sale of products and/or services. Businesses also require services from other businesses such as refuse collection. These activities are often required to occur daily or multiple times per day. The construction phase of the project would result in changes to loading zones, road performance and road network configuration, which can affect the reliability and capacity of servicing and delivery. This would result in time and vehicle related costs as well as lost revenue for businesses. The overall significance of construction impacts on servicing and deliveries at business centres would generally be moderate to low or low and would be temporary in nature.

Construction of the project may also have negative impacts on maritime operations due to temporary changes in access. Some businesses within the James Craig Road Working Waterfront may experience impacts to servicing and deliveries of low significance due to increased usage of the waterway by construction vessels and to changes in access, respectively.

Amenity

The construction phase of the project would affect the amenity of an environment, including for people visiting or working at local businesses in the precinct areas. This would be as a result of increased noise, vibration and dust, or reduced visual outlook and business visibility. Changes to amenity can affect business ambience, productivity, functionality, exposure and client patronage. Business clusters that have higher dependency on amenity to attract and retain customers would be more susceptible to changes in amenity as a result of construction activity.

During construction, visual amenity would be affected by the removal of vegetation and the introduction of construction support sites, equipment and other visible elements such as hoardings and fencing. This is most likely to impact on those retail, personal service providers, cafes and restaurants that rely on the pleasantness and quality of an environment to attract customers. Important aspects of visual amenity which may be affected include access to natural daylight, clear sightlines and permeability to the surrounding landscapes. Businesses that rely on storefront exposure to attract customers may be affected by reduced visibility or safety concerns to customers as a result of the presence of construction machinery and materials.

Increased noise and vibration levels from construction activities and traffic could also impact on customer amenity, and on the amenity and productivity levels of employees. Exposure to dust and

air pollutants could impact on cleanliness and attraction in particular for sensitive business receivers such as education, accommodation and food services that rely on outdoor dining.

Reductions in the amenity as a result of construction were assessed as having a moderate significance on local businesses in the Victoria Road/Darling Street Centre as the result of a moderate level of sensitivity and moderate magnitude of change. The significance of construction on impacts to amenity was assessed as being moderate to low for local businesses in the North Sydney CBD, and low in Artarmon Industrial. At other business centres the impacts would generally be low or insignificant (negligible).

Business visibility

The construction phase of the project would result in changes to vehicle, pedestrian and cyclist flows that could 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, which could result in a loss of trade. Generally the impact of construction on the visibility of business would be positive.

Demand for services

The construction phase of large infrastructure projects can affect demand for local and regional goods and services. This can result in both negative and positive impacts with some businesses experiencing a loss of customers avoiding particular areas due to construction activities while other businesses may experience increased trade from construction workers in the area. Demand for services, such as construction recruitment agencies, construction companies and resource suppliers, can also be generated from infrastructure projects, creating employment opportunities both within and outside local business centres.

Construction of the project would benefit short-term local employment opportunities through the creation of direct construction related employment on the project and indirect employment opportunities in businesses and industries that support the construction works. An increase in construction workers in an area often provides an economic injection into the local economy due to increased demand for local services. As a consequence of the increase in workers associated with construction of the project, the largest benefits from increased trade are anticipated for convenience retail and the food and beverage industry.

Demand for services of business centres along the project are generally assessed as being benefited during construction of the project.

Displacement of businesses

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 significance of property acquisition or lease cessation on businesses would vary in scale, depending on the number of business properties to be acquired, their associated contribution to the local economy and the ability of the remaining local business catchment to absorb the change. Although the impact on individual businesses may be significant, the compensation process is generally designed to reduce this impact. Overall, negative impacts would be limited to the

individual businesses and would unlikely affect the broader business environment or industries (refer to the Business Impact Assessment in Appendix U (Technical working paper: Socio-economic assessment)).

Maritime businesses

Construction activities have the potential to impact maritime businesses as follows:

- Construction activities have potential to affect employee and customer access from the Birchgrove Ferry Wharf closure and partial closure of the harbour between Birchgrove and Berrys Bay (moderate significance)
- The scheduled partial closures of the harbour would restrict larger vessels, including oil tankers, to cross the harbour between Birchgrove and Berrys Bay at times. Cruise ships would not be affected by these closures as the terminals are positioned outside the restriction zone (moderate-low significance)
- Glebe Island and White Bay land with deep water frontages impacts: White Bay berths 2, 4, and 5 (Cruise Terminal) and 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 (moderate-low significance)
- Impacts from delayed commercial operations during scheduled partial harbour closures. This has the 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 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. This may be particularly experienced around White Bay where the cruise terminal and temporary construction support site are on the same peninsular (moderate significance)
- Changes on character and amenity of the harbour during construction has the capacity to effect businesses, particularly tourism businesses that attract clients due to the experience and appeal of the harbour. The increase in 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 significance).

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 marine industry. 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 Chapter 8 (Construction traffic and transport) for safeguards to manage impacts from maritime construction activities.

21.4.8 Access and connectivity

Potential short-term impacts on access and connectivity are identified below.

Roads and private access

The following potential impacts are anticipated:

- Temporary changes to road conditions near construction activities, including partial and full road closures, temporary diversions and access changes, removal of some on-street parking, resulting in possible delays and disruptions for motorists and other road users
- Increased construction traffic on roads within the precinct areas, 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
- Removal of parking spaces along Ernest Street, Ridge Street and Alfred Street North, resulting in a reduction of available parking. At Ernest and Ridge streets reduced parking could be accommodated on nearby local roads, however a net loss of on-street parking in North Sydney and Neutral Bay would be experienced as there no alternatives nearby
- Access to private properties near to proposed works is generally expected to be maintained during construction. Where temporary changes are required, suitable access arrangements would be implemented in consultation with affected property owners
- Establishment of maritime speed restrictions around construction equipment, resulting in possible increases in transit time for recreational, commercial and government vessels. Maritime transport and construction vessel routes and numbers are discussed in Chapter 6 (Construction works).

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 is assessed as moderate. 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.

Public and active transport

The following potential public transport impacts are anticipated:

- Potential disruptions to bus services, including from changes to road conditions and the temporary relocation of some bus stops near to construction works for safety, resulting in possible delays and disruptions for bus users and changes in bus access for some people
- Temporary relocation of some bus stops, as well as delays or changes in local routes due to temporary road closures, such as during the closure periods of the Warringah Freeway
- Temporary closure of Birchgrove Ferry wharf.

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.

The following potential active transport impacts are anticipated:

- Temporary closures of the shared user path along Ernest Street would be required for safety of pedestrians and cyclists. Detours would be provided for pedestrians and cyclists during temporary closure periods
- 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. Due to existing low volumes of pedestrians and cyclists using the underpass, this impact is considered to be low.

Overall, the sensitivity of individuals due to changes to existing access and magnitude of potential impacts are considered low. As such, the overall significance of impacts on active transport are considered low.

Maritime transport

The following potential maritime transport impacts are anticipated:

- Around 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 or alternate services. Recreational marine traffic would also not be able to use this section of Sydney Harbour during the closure
- Closure of the Birchgrove Wharf for a period of about 48 months, during use of the construction support site at Yurulbin Park (WHT3). During construction, people would be required to use alternatives available such as the Balmain Ferry Wharf (located about 2.2 kilometres from Birchgrove Wharf) which serves the same ferry routes, as well as bus route 441, accessible from Grove Street (located about 750 metres from Birchgrove Wharf) and providing connections to Sydney CBD and other bus services operating along Victoria Road. Customers would be notified of any anticipated changes to the ferry network to allow for customers to plan their journey well ahead of time. Appropriate signage would also be provided at ferry wharves informing patrons of any changes. The closure of Birchgrove Wharf may require some passengers to walk further distances to access alternative modes of transport
- Construction activities in the inner harbour (related to the Sydney Harbour crossing) would periodically result in minor increases to transit time for recreational, commercial and government vessels
- Navigational restrictions would temporarily restrict access of larger vessels such as oil tankers to cross the Harbour between Birchgrove and Berrys Bay
- Sailing clubs would need to alter their courses to maintain a competitive outcome while construction activities are underway
- Marine Rescue NSW would not be directly impacted by the construction activities. However, the construction activities may increase its emergency response time in the outer harbour or offshore. Marine Rescue NSW would be consulted with to increase patrols operating out of Middle Harbour that could service the outer harbour and offshore during periods when construction activities may impact the response time of the Marine Rescue NSW base at Birkenhead Point
- Around ten swing-moorings in the vicinity of the Berrys Bay construction support site (WHT7) would be relocated to provide safe access to and from the site. 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.

Overall, potential impacts on maritime transport during construction have been assessed to have moderate-low significance, with the sensitivity of maritime users considered moderate and magnitude of impacts considered 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.

21.5 Assessment of potential operational impacts

The operation of the project has the potential to positively and negatively affect residents, businesses, road users, users of social infrastructure and the wider community. This section provides an assessment of potential social and economic impacts within the precinct areas during operation of the project.

21.5.1 Equity

The operation of the project would provide improved access and connectivity which would benefit the wider community and people living and working in or near the precinct areas. In particular, reduced congestion, improved journey times and improved movement of people and freight provided by the project would help to reduce travel times for individuals, families and the wider community, increase time available to individuals and families for leisure 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 help to reduce traffic on arterial roads. It would also support local environment and amenity improvements in the precinct areas and surrounding region and improve access and connectivity for residents, business and industry in the precinct areas, northern suburbs, south-western suburbs and the Greater Sydney region.

21.5.2 Population and demography

Travel time savings and improved accessibility provided by the project are likely to make some areas within or near to the precinct areas more attractive for people looking to relocate. While this change has been occurring and is expected to continue, 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.

21.5.3 Social infrastructure

As discussed in Section 21.4.4, a number of open spaces would be used during construction of the project. At completion, land not required would be rehabilitated and reinstated, however some land would be retained for operational purposes as follows:

- A portion of land at Cammeray Golf Course would be acquired to accommodate operational facilities and other utilities, including those shared with the Beaches Link and Gore Hill Freeway Connection project. This would require the reconfiguration of the golf course to allow its ongoing use. The establishment of operational facilities would change the visual setting of this location. Landscaping would be provided to reduce the visual impacts of these facilities. Further discussion about the project's impacts on visual and landscape impacts are provided in Chapter 22 (Urban design and visual amenity). 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
- 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

- Small areas of ANZAC Avenue Reserve, Merlin Street Reserve and Rose Avenue Reserve would be impacted to accommodate the widening of the Warringah Freeway. This is not expected to impact on the ongoing use or functioning of the park and facilities within the park. The sensitivity of the areas affected by the project's operation and the magnitude of the impact are considered low, resulting in the overall significance of potential impacts is assessed as low.

During operation, the project would contribute to improved access and connectivity through improved travel time and improved travel time reliability, including to local and regional infrastructure within and near the precinct areas including major hospitals, tertiary education facilities, regional and state sport and recreation facilities, and major retail, commercial uses, cultural and community support facilities (refer to Section 21.3.2). Noise impacts may be experienced by social infrastructure adjacent to some surface roads (Johnston Street at Rozelle and Ernest Street, West Street and Miller Street at North Sydney) which would experience increased traffic demands as a result of the project. 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.

21.5.4 Community values

Local amenity and character

Operation of the project may result in changes to traffic noise levels for communities near to the tunnel connections and Warringah Freeway. In particular, increased traffic noise may be experienced by some receivers near to 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 at some properties near the Warringah Freeway Upgrade due to the forecast reduction in traffic volumes along existing surface roads with traffic being moved to tunnels. 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.

Community cohesion

During operation, the project would support improved travel and access to work, business and leisure activities in the precinct areas and wider Greater Sydney region. Regionally, improved accessibility and connectivity is likely to provide long-term benefits for community cohesion. In particular, travel facilitates social interactions and where access on major routes is constrained, some people may avoid making trips. Decreased travel times and improved travel time reliability may encourage some people to make trips they otherwise would not, helping to facilitate community cohesion.

Community cohesion is encouraged by connectivity or discouraged by barriers to movement. Changes to traffic volumes 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.

Changes to the Cammeray Golf Course may impact on the use of the golf course for some members. 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.

Community health and wellbeing

Some residents and communities near the project may experience a level of stress and anxiety (refer to Chapter 13 (Human health)) due to uncertainty about potential property impacts and proposed changes. This may impact on the health and wellbeing of some individuals. Some residents 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 the relocation of residents.

The operation of ventilation outlets at Rozelle and Cammeray may influence 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, ANZAC Park Public School, ANZAC Park, Cammeray Park, Cammeray-Neutral Bay Skate Park, Cammeray Tennis Club, ANZAC Park Public School and Wenona School). The project tunnel ventilation outlets would be unlikely to result in adverse impacts on local air quality. Refer to Chapter 12 (Air quality) for an assessment of air quality impacts from the project. The health impact assessment carried out for the project also found that potential health impacts associated with changes in air quality in the local community are considered to be acceptable. Further information on health impacts associated with the project's operation is provided in Chapter 13 (Human health) of the environmental impact statement. 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.

21.5.5 Economics

Employment

The project would support improved access and connectivity to employment areas in the study area and the wider Sydney region. Changes to the business environment or the acquisition of properties accommodating businesses as part of the project may cause some loss of local employment. 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 precinct areas.

Freight and efficiency costs

Operation of 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.

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 North Sydney CBD, the strategic centre of St Leonards and the metropolitan Harbour CBD.

The introduction of an additional transport connection can lead to expanded trade catchment opportunities. 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 due to the project. 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.

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. If introduced, 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 assessed significance of impacts associated with tolling, should northbound tolling be introduced, 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. Overall, although the potential introduction of tolling would be a direct cost to businesses and persons, this would be offset by the reductions in congestion and travel time savings.

21.5.6 Business and industry

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

- Changes to passing trade at businesses due to changes in traffic volumes
- Improved travel times for employees and customers accessing the centres due to increased travel speeds
- Changes to access for employees and customers
- Potential increase to the trade catchment for some businesses, due to improved accessibility.

Potential impacts on business and industry have been assessed for those business centres identified as being most likely to experience direct and indirect operational impacts as discussed below.

Passing trade

Operation of the project may result in changes to vehicle, pedestrian and cyclist flows that could influence the level of passing trade.

Localised impacts on passing trade at the North Sydney CBD are expected to be negligible with the level of sensitivity low and the magnitude of change negligible. These impacts would generally result from localised road changes and congestion and the removal of on-street parking during peak periods (refer to Chapter 9, Operational traffic and transport). The net increase in traffic flows to North Sydney throughout the day would also contribute to offsetting any potential impact. The Neutral Bay Junction centre is generally expected to benefit by increased passing trade as a result of increased vehicles travelling through the area.

Employee and customer access

Operation of the project may result in changes to road, public transport and active transport networks, which may affect employee and customer access.

Overall, there would be substantial improvements to the broader traffic and transport network from surrounding areas that would enhance connectivity and travel time efficiency. Generally, the North Sydney CBD would experience changes in some localised accessibility of businesses during operation of the project due to reconfigurations in the local road network and increase in traffic demands to some areas. Mobility by vehicle or bus in the centre would decrease with more vehicles moving through the centre and alterations in the road configuration to prioritise certain

movements in peak periods. However, this would be offset by the forecast travel time improvements across the broader network. The level of sensitivity and magnitude of change at this centre would be low.

Employee and customer access to Neutral Bay Junction would benefit from improved access to and travel times on the Sydney Harbour Bridge and Sydney Harbour Tunnel due to redistribution of traffic flows. Businesses would generally not be affected by parking alterations on Ben Boyd Road and Ernest Street as part of the project. Overall the significance of impacts would be negligible as the sensitivity of the centre is negligible and the magnitude of change is considered to be negligible.

Other business centres are expected to experience a negligible or positive impact on employee and customer access.

Servicing and deliveries

The project would generally result in benefits to servicing and deliveries for businesses due to increased travel speeds, which would improve connectivity to the broader network and enhance service and delivery capacity.

Some localised impacts to servicing and delivery for businesses within the St Leonards - Crows Nest Centre may be experienced due to alternative route arrangements, potentially resulting in delays or inefficiencies. The sensitivity of the centre would be low and the magnitude of change would be negligible. As a result the significance of the operation of the project on servicing and deliveries within the St Leonards - Crows Nest Centre would be negligible. Within the North Sydney CBD, the project would result in some localised traffic congestion, intersection delays and clearway operation which would reduce mobility within parts of the centre for servicing and deliveries during peak traffic periods. 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 in this localised area. The level of significance of these localised servicing and delivery impacts would be low. However, in general North Sydney CBD would experience benefits due to the substantial improvements to strategic accessibility from surrounding areas.

Amenity

Camberay Golf Course would experience some negative visual impact during operation of the project due to the presence of motorway facilities. The motorway facilities would constitute major new built form within the view, adversely affecting the visual amenity of the club users. As the club house 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. For the individual business the sensitivity is moderate and the magnitude of impact is moderate. The broader Neutral Bay centre would be able to adapt to the change. Level of sensitivity is negligible.

Other business centres are expected to experience an insignificant or positive impact amenity.

Business visibility

The operation of the project may result in benefits for businesses within the James Craig Road Working Waterfront due to improved business visibility as a result of increased traffic at this location.

Demand for services

During operation of the project, businesses are generally expected to experience positive impacts on demand for services due to improved access and connectivity and increased trade catchments.

Maritime businesses

Once in operation, the project would have negligible impacts on businesses reliant on the harbour. The project would not result in a reduction in water depth at the proposed harbour crossing and would not impact Glebe Island and White Bay land with deep water frontages. Refer to Chapter 9 (Operational traffic and transport) for further details.

21.5.7 Access and connectivity

Road and private access

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 improve travel times for road users on 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 and North Sydney. This would have positive long-term impacts for all road users.

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 strategic travel time benefits provided by the project. 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.

Public and active transport

The project would also provide opportunity for improved access to public transport for local communities. 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 shift to public transport.

The project would improve cyclist and pedestrian connectivity along the project corridor through increased provision of dedicated cyclist and pedestrian links. This includes the provision of a new and upgraded pedestrian and cyclist infrastructure around surface connections and along the upgraded Warringah Freeway. It is anticipated that these improvements in connectivity would encourage greater use of this infrastructure by pedestrians and cyclists.

During 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 and active transport would mainly be associated with localised increases to travel times during the busiest peak periods on some bus routes through North Sydney, in the absence of further mitigation measures. Given the localised nature of potential impacts, the sensitivity of communities to changes in public transport and the magnitude of change are generally considered low, resulting in an overall significance of public transport impacts being assessed as low.

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

21.6 Environmental management measures

Measures to avoid, minimise or manage social and economic impacts as a result of the project are detailed in Table 21-6. 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 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 21-6 Environmental management measures – socio-economics

Ref	Phase	Impact	Environmental management measure	Location
SE1	Design	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	Construction		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	Construction		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, places of worship, aged care, child care, health and medical facilities) about the timing and duration of construction works and management of potential impacts.	WHT/WFU
BU1	Pre-construction and construction	Business	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	Construction		Specific consultation will be carried out with businesses potentially impacted during construction. Consultation will aim to identify specific potential construction impacts for	WHT/WFU

Ref	Phase	Impact	Environmental management measure	Location
			individual businesses.	
BU3	Construction		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

Western Harbour Tunnel = WHT, Warringah Freeway Upgrade = WFU.

