Appendix P

Technical working paper: Social and economic

WestConnex

Roads and Maritime Services

WestConnex – M4-M5 Link

Technical working paper: Social and economic

August 2017

Prepared for

Roads and Maritime Services

Prepared by

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Glossary of terms and abbreviations

Term	Definition
A	
ABS	Australian Bureau of Statistics
AECOM	AECOM Australia Pty Ltd
Arterial roads	The main or trunk roads of the state road network that carry predominantly through traffic between regions
B	
Bioretention facility	Landscaped depression designed to treat stormwater runoff to remove contaminants and sediment
Bus lane	A traffic lane dedicated to buses, but which can also be used by taxis, bicycles and motorcycles
C	
Campbell Road civil and tunnel site	A construction ancillary facility for the M4-M5 Link project at St Peters
Campbell Road motorway operations complex	An area where operational ancillary facilities are established. Located within the St Peters interchange, south of Campbell Road at St Peters, on land occupied during construction by the Campbell Road civil and tunnel site
CBD	Central business district
CEMP	Construction Environmental Management Plan
CNVMP	Construction Noise and Vibration Management Plan
Concept design	Initial functional layout of a road/road system or other infrastructure. Used to facilitate understanding of a project, establish feasibility and provide basis for estimating and to determine further investigations needed for detailed design
Construction fatigue	Impact on receivers in the vicinity of concurrent and/or consecutive construction activities
CPI	Consumer price index
CPTED	Crime prevention through environmental design
CSSI	Critical State significant infrastructure
CTAMP	Construction Traffic and Access Management Plan
Cumulative impacts	Impacts that, when considered together, have different and/or more substantial impacts than a single impact assessed on its own
D	
Darley Road civil and tunnel site	A construction ancillary facility for the M4-M5 Link project located at Leichhardt
Darley Road motorway operations complex	An area where operational ancillary facilities are established. Located at Leichhardt, south of City West Link and the Inner West Light Rail line on land occupied during construction by the Darley Road civil and tunnel site
dBA	A-weighted decibels A-weighting is applied to instrument-measured sound levels in effort to account for the relative loudness perceived by the human ear, as the ear is less sensitive to low audio frequencies
DCP	Development Control Plan
Do minimum	A model scenario that does not incorporate the proposed project infrastructure
Do something	A model scenario that incorporates the proposed project infrastructure
Do something cumulative	A model scenario that incorporates the proposed project infrastructure and other relevant project infrastructure
DP&E	NSW Department of Planning and Environment
E	
EIA	Economic Impact Assessment
EIS	Environmental impact statement

Term	Definition
Environment	As defined within the *Environmental Planning and Assessment Act 1979* (NSW), all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
G	
GCCSA	Greater Capital City Statistical Area
GIS	Geographical information systems
GRP	Gross Regional Product
GSC	Greater Sydney Commission
GSP	NSW Gross State Product
Growing Sydney	*A Plan for Growing Sydney* (NSW Government 2014)
GVA	Gross Value Add
H	
Haberfield civil and tunnel site/Haberfield civil site	Construction ancillary facilities for the M4-M5 Link project located at Haberfield
HCA	Heritage Conservation Area
Heavy vehicles	A heavy vehicle is classified as a Class 3 vehicle (a two axle truck) or larger, in accordance with the Austroads Vehicle Classification System
Heritage item	Any place, building or object listed on a statutory heritage register
I	
Impact	Influence or effect exerted by a project or other activity on the natural, built and community environment
In situ	In the natural or original position. Applied to a rock, soil, or fossil when occurring in the situation in which it was originally formed or deposited
Inner West Council	The amalgamation of the former local government areas of Ashfield, Leichhardt and Marrickville, proclaimed on 12 May 2016
Inner West subsurface interchange	A subsurface interchange at Leichhardt and Annandale that would link the mainline tunnels with the Rozelle interchange and the Iron Cove Link
Interchange	A grade separation of two or more roads with one or more interconnecting carriageways
Iron Cove Link civil site	A construction ancillary facility for the M4-M5 Link project located at Rozelle
Iron Cove Link motorway operations complex	An area where operational ancillary facilities are established. Located south of the realigned Victoria Road carriageway between Callan Street and Springside Street at Rozelle, on land occupied during construction by the Iron Cove Link civil site
Iron Cove Link ventilation facility	Ventilation supply and exhaust facilities, axial fans, ventilation outlets and ventilation tunnels. Located at Rozelle
IVA	Industry Value Add
J	
Just Terms Act	*Land Acquisition (Just Terms Compensation) Act 1991* (NSW)
L	
LAC	Local Area Command
L_{Aeq}	The 'energy average noise level'
LCZ	Landscape character zones
LEP	Local Environmental Plan
LGA	Local government area
Local road	A road or street used primarily for access to abutting properties
LoS	Level of service
M	
m	Metres
m^2	Square metres
M4 East mainline stub tunnels	Eastbound and westbound extensions of the M4 East mainline tunnel being built as part of the M4 East project (to connect with the M4-M5

Term	Definition
	Link)
M4 East mainline connection	The underground connection between the M4-M5 Link mainline tunnels and the M4 East mainline stub tunnels
M4 East Motorway/project	A component of the WestConnex program of works. Extension of the M4 Motorway in tunnels between Homebush and Haberfield via Concord. Includes provision for a future connection to the M4-M5 Link at the Wattle Street interchange
M4 Motorway	The M4 Motorway is a 40 kilometre motorway that extends from Concord in Sydney's inner west to Lapstone at the foothills of the Blue Mountains
M4 Widening	A component of the WestConnex program of works. Widening of the existing M4 Motorway from Parramatta to Homebush
M4-M5 Link	The project which is the subject of this EIS. A component of the WestConnex program of works
M5 East Motorway	Part of the M5 Motorway corridor. Located between Beverly Hills and Sydney Airport (General Holmes Drive)
M5 Motorway corridor	The M5 East Motorway and the M5 South West Motorway
M5 South West Motorway	Part of the M5 Motorway corridor. Located between Prestons and Beverly Hills
Mainline tunnels	The M4-M5 Link mainline tunnels connecting with the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters
MCOA	Minister's Conditions of Approval
MLALC	Metropolitan Local Aboriginal Land Council
Motorway	Fast, high volume controlled access roads. May be tolled or untolled
N	
NCA	Noise catchment area
New M5 mainline stub tunnels	Northbound and southbound extensions of the New M5 mainline tunnel being built as part of the New M5 project (to connect with the M4-M5 Link)
New M5 mainline connection	The underground connection between the M4-M5 Link mainline tunnels and the New M5 mainline stub tunnels
Northcote Street civil site	A construction ancillary facility for the M4-M5 Link project located at Haberfield
NSW	New South Wales
NSW EPA	NSW Environment Protection Authority
P	
PAH	Polycyclic aromatic carbons
Parramatta Road East civil site	A construction ancillary facility for the M4-M5 Link project at Haberfield
Parramatta Road Transformation Strategy	The Parramatta Road Corridor Urban Transformation Strategy (UrbanGrowth NSW 2016)
Parramatta Road ventilation facility	A ventilation facility located on the south-eastern corner of the Parramatta Road / Wattle Street intersection (referred to as the Eastern ventilation facility in the M4 East project EIS). The facility is being built as part of the M4 East project. As part of the M4-M5 Link project, fitout works would be carried out on a section of this facility
Parramatta Road West civil and tunnel site	A construction ancillary facility for the M4-M5 Link project at Ashfield
Portal	The entry and/or exit to a tunnel

Term	Definition
Project	A new multi-lane road link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters. The project would also include an interchange at Lilyfield and Rozelle (the Rozelle interchange) and a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge (Iron Cove Link). In addition, construction of tunnels, ramps and associated infrastructure to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project would be carried out at the Rozelle interchange
Project footprint	The land required to construct and operate the project. This includes permanent operational infrastructure (including the tunnels), and land required temporarily for construction
Property	Based on ownership, with the potential to contain more than one lot and Deposited Plan (DP)
Proponent	The person or organisation that proposes to carry out the project or activity. For the purpose of the project, the proponent is NSW Roads and Maritime Services
Public transport	Includes train, bus (government and private), ferry (government and private) and light rail (government and private) services
Pyrmont Bridge Road tunnel site	A construction ancillary facility for the M4-M5 Link project at Annandale
R	
Roadheader	A commonly used machine for excavation in sandstone using picks mounted on a rotary cutter head attached to a hydraulically operated boom
Roads and Maritime	NSW Roads and Maritime Services
Rozelle civil and tunnel site	A construction ancillary facility for the M4-M5 Link project located at Lilyfield and Rozelle
Rozelle East motorway operations complex	An area where operational ancillary facilities are established. Located at the western end of the Rozelle Rail Yards on land occupied during construction by the Rozelle civil and tunnel site
Rozelle interchange	A new interchange at Lilyfield and Rozelle that would connect the M4-M5 Link mainline tunnels with City West Link, Anzac Bridge, the Iron Cove Link and the proposed future Western Harbour Tunnel and Beaches Link
Rozelle Rail Yards	The Rozelle Rail Yards is bound by City West Link to the south, Lilyfield Road to the north, Balmain Road to the west, and White Bay to the east. Note that the project only occupies part of the Rozelle Rail Yards site
Rozelle ventilation facility	Ventilation supply and exhaust facilities, axial fans, ventilation outlets and ventilation tunnels. Located at the Rozelle Rail Yards, the ventilation supply facility is located at the Rozelle West motorway operations complex and a ventilation exhaust facility at the Rozelle East motorway operations complex
Rozelle West motorway operations complex	An area where operational ancillary facilities are established. Located at the central/eastern end of the Rozelle Rail Yards, on land occupied during construction by the Rozelle civil and tunnel site
S	
SA1	Statistical Area 1 (ABS)
SA2	Statistical Area 2 (ABS)
SEARs	Secretary's Environmental Assessment Requirements. Requirements and specifications for an environmental assessment prepared by the Secretary of the NSW Department of Planning and Environment under section 115Y of the *Environmental Planning and Assessment Act 1979* (NSW).
SEIA	Socio-economic impact assessment
SEIFA	Socio-Economic Indexes for Areas

Term	Definition
Sensitive receiver/receptor	Includes residences, educational institutions (including preschools, schools, universities, TAFE colleges), health care facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres, passive recreation areas (including outdoor grounds used for teaching), active recreation areas (including parks and sports grounds), commercial premises (including film and television studios, research facilities, entertainment spaces, temporary accommodation such as caravan parks and camping grounds, restaurants, office premises, retail spaces and industrial premises)
SEPP	State Environmental Planning Policy
SES	State Emergency Services
SMC	Sydney Motorway Corporation
Socio-economic	Involving combination of social and economic matters
Spoil	Surplus excavated material
State Infrastructure Strategy	*State Infrastructure Strategy 2012–2032* (Infrastructure NSW 2012)
State Infrastructure Strategy Update	*State Infrastructure Strategy – the State Infrastructure Strategy Update 2014* (Infrastructure NSW 2014)
St Peters interchange	A component of the New M5 project, located at the former Alexandria Landfill site at St Peters. Approved and under construction as part of the New M5 project. Additional construction works proposed as part of the M4-M5 Link project
Stub tunnel	Driven tunnels constructed to connect to potential future motorway links
Sydney LEP 2012	*Sydney Local Environmental Plan 2012*
Sydney Gateway	A high-capacity connection between the St Peters interchange (under construction as part of the New M5 project) and the Sydney Airport and Port Botany precinct
Sydney's Bus Future	*Sydney's Bus Future: Simpler, faster, better bus services* (Transport for NSW 2013)
Sydney's Cycling Future	*Sydney's Cycling Future: Cycling for everyday transport* (Transport for NSW 2013)
Sydney's Rail Future	*Sydney's Rail Future: Modernising Sydney's Trains* (Transport for NSW 2012)
T	
The Bays Precinct Transformation Plan	Transformation Plan: The Bays Precinct, Sydney (UrbanGrowth NSW 2015)
The Crescent civil site	A construction ancillary facility for the M4-M5 Link project located at Annandale
Transport for NSW	NSW Government Department Transport for NSW
TPA	Transport Performance Analytics
U	
UDLP	Urban Design and Landscape Plan
Urban design	The process and product of designing human settlements, and their supporting infrastructure, in urban and rural environments
V	
Ventilation facility	Facility for the mechanical removal of air from the mainline tunnels, or mechanical introduction of air into the tunnels. May comprise one or more ventilation outlets
Ventilation outlet	The location and structure from which air within a tunnel is expelled
VHT	Vehicle hours travelled
Victoria Road civil site	A construction ancillary facility for the M4-M5 Link project located at Rozelle
VKT	Vehicle kilometres travelled
VOCs	Volatile organic compounds

Term	Definition
W	
Wattle Street civil and tunnel site	A construction ancillary facility for the M4-M5 Link project located at Haberfield
Wattle Street interchange	An interchange to connect Wattle Street (City West Link) with the M4 East and the M4-M5 Link tunnels. Approved and under construction as part of the M4 East project. Additional construction works proposed as part of the M4-M5 Link project
Western Harbour Tunnel and Beaches Link	The Western Harbour Tunnel component would connect to the M4-M5 Link at the Rozelle interchange, cross underneath Sydney Harbour between the Birchgrove and Waverton areas, and connect with the Warringah Freeway at North Sydney. The Beaches Link component would comprise a tunnel that would connect to the Warringah Freeway, cross underneath Middle Harbour and connect with the Burnt Bridge Creek Deviation at Balgowlah and Wakehurst Parkway at Seaforth. It would also involve the duplication of the Wakehurst Parkway between Seaforth and Frenchs Forest
WestConnex program of works	A program of works that includes the M4 Widening, King Georges Road Interchange Upgrade, M4 East, New M5 and M4-M5 Link projects
WRTM	WestConnex Road Traffic Model

Executive summary

NSW Roads and Maritime Services (Roads and Maritime) is seeking approval to construct and operate the WestConnex M4-M5 Link (the project), which would comprise a new multi-lane road link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters. The project would also include an interchange at Lilyfield and Rozelle (the Rozelle interchange) and a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge (Iron Cove Link). In addition, construction of tunnels, ramps and associated infrastructure to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project would be carried out at the Rozelle interchange.

Together with the other components of the WestConnex program of works and the proposed future Sydney Gateway, the project would facilitate improved connections between western Sydney, Sydney Airport and Port Botany and south and south-western Sydney, as well as better connectivity between the important economic centres along Sydney's Global Economic Corridor and local communities.

The other component projects of WestConnex include the M4 East and New M5 (both with planning approval granted and under construction), M4 Widening and King Georges Road Interchange Upgrade (both with planning approval granted, construction completed and open to traffic).

This report assesses the socio-economic impact of the proposed construction and operation of the M4-M5 Link project. This report has been prepared as a technical working paper to the environmental impact statement (EIS). Information used for this assessment reflects the current available knowledge of the project. If approved, the project would progress to detailed design with further design adjustments and management strategies developed during this phase.

The socio-economic impact assessment identifies and assesses the potential positive and negative social, economic and business impacts that may arise due to the construction and operation of the project. Environmental management measures have been identified to avoid, reduce, mitigate or manage adverse impacts associated with the project. Cumulative impacts associated with successive, incremental, and/or combined effects of a project when added to other existing, planned, and/or reasonably anticipated future project have been analysed.

The socio-economic impact assessment has been undertaken in accordance with the Roads and Maritime *Environmental Impact Assessment Practice Note - Socio-economic assessment* (EIA-N05) and to address the Secretary's Environmental Assessment Requirements (SEARs) for the project. As part of this, the assessment considers a range of policy and strategy objectives at local, state and Commonwealth levels, and how the project complements these.

For the purpose of the report, Australian Bureau of Statistics (ABS) geographic boundaries (referred to as Statistical Area Level 2 (SA2)) were used to define the socio-economic study area. The study area includes:

- Ashfield-Haberfield Precinct including the suburbs of Five Dock, Abbotsford, Ashfield, Haberfield, Summer Hill, Burwood and Croydon
- Leichhardt-Glebe Precinct including the suburbs of Forest Lodge, Balmain, Rozelle, Lilyfield, Annandale, Leichhardt and a portion of Camperdown
- Alexandria-Erskineville Precinct including the suburbs of Erskineville, Alexandria, Newtown, Darlington, Redfern, Chippendale, Eveleigh, Sydenham, Tempe, St Peters, Petersham, Stanmore and a proportion of Enmore and Camperdown,

Although a study area has been defined, it is acknowledged that the spatial extent of potential effects would vary and would not be limited to the study area. For this reason, the impact assessment considers changes to the socio-economic environment both within the study area and further afield.

Design development

Since the inception of the M4-M5 Link project, various design options have been considered with respect to key components of the project. This included the location of interchanges, the alignment of the mainline tunnel and the inclusion and configuration of Iron Cove Link. This development process

has allowed the project to achieve enhanced outcomes in both an operational and environmental sense.

Engagement with the community and design testing has informed the progression of the concept design development. In response to community concern and design constraints, a number of substantial changes have been made to the project design. These amendments have been made to reduce the potential construction effects on the community and improve the overall project outcome.

Project design alterations to reduce potential socio-economic construction impacts include:

- Adjustment of the project footprint to avoid using Easton Park at Rozelle during construction and to minimise impact on Lilyfield Road and the heritage listed Sydney Water sewerage pumping station
- Adjustment of the project footprint to avoid using areas around Blackmore Park, Leichhardt during construction
- Deletion of a construction site in Derbyshire Road, Leichhardt adjacent to Sydney Secondary College (Leichhardt campus) to prevent amenity, traffic and heritage impacts
- As a result of the deletion of the Camperdown interchange, adjustment of the mainline tunnel alignment further to the west which has avoided construction impacts on the Royal Prince Alfred Hospital and the University of Sydney
- The selection of spoil haulage routes to primarily follow the arterial road network and avoid local roads
- The restriction of hours for spoil haulage from the Darley Road construction site to standard construction hours to avoid noise, traffic and amenity impacts on local residents.

In addition, a number of the concept design adjustments have been made to improve the project outcomes, these being:

- Inclusion of Iron Cove Link as part of project
- Adjustments of the Rozelle interchange design option to be located predominantly below ground and within the north of Rozelle Rail Yards. This has enabled the opportunity for the creation of a significant open space area and active transport links (north–south and east–west) as a result of the undergrounding of transport infrastructure
- Removal of Camperdown ramps to reduce traffic impacts along Parramatta Road
- Adjustment of the mainline tunnel from three to four traffic lanes in each direction
- Selection of ventilation facility locations to minimise local air quality impacts on nearby receptors
- Adjustments to construction staging to enable the mainline tunnel to be operational one year ahead of the remainder of the project.

Despite these changes, the construction of the project would still result in impacts upon a range of socio-economic factors across the study area during construction and operation.

Construction and operation

Access and connectivity

During construction and operation, changes to parking, road, public transport and active transport networks would affect access and connectivity for road users, residents, business owners, social infrastructure users and visitors.

During construction, these changes are likely to arise from the establishment and operation of construction sites, portals, interchanges and ancillary infrastructure that trigger alterations or disruptions to traffic and transport connections and access to properties, businesses and social infrastructure. The greatest socio-economic impacts associated with this phase are expected to be those relating to the road network such as connectivity and congestion. Impacts upon pedestrian and cyclist connectivity, parking and public transport are not anticipated to be significant impacts.

Upon operation, the project would deliver an integrated motorway and local road network that would provide substantial benefits to Greater Sydney and would create opportunity for future connections to western and south-western Sydney, Sydney Airport and Port Botany. The overall socio-economic impact of the project during this phase is considered positive, improving transport efficiency, business connectivity and active transport connections.

Road network

Changes in road network connectivity and efficiency would occur across the study area as a result of construction and operation.

Impacts during construction would include traffic disruptions and diversions due to temporary, partial or full closures of roads, increased construction traffic (including heavy vehicles) and changes to speed limits near construction works. Direct and indirect traffic disruptions would be experienced on local and arterial roads in most suburbs that are in close proximity to construction sites. This would include the suburbs of Haberfield, Ashfield, St Peters, Camperdown, Annandale, Lilyfield, Leichhardt, Rozelle and Balmain. For most local roads, these modifications would be temporary with full access reinstated upon completion of construction works.

To reduce the potential impact on local streets and neighbourhoods, spoil haulage would be predominantly restricted to arterial roads. Darley Road is the exception to this where spoil haulage along this route would be restricted standard working hours (7.00 am to 6.00 pm Monday to Friday, 8.00 am to 1.00 pm Saturday and no work on Sundays). Properties along these roads may experience a marginal increase in travel time, however the variance from the existing environment is unlikely to be substantial and as such would only result in a minor negative impact on the socio-economic environment.

During construction, arterial roads are expected to experience more extensive impacts that would affect the efficiency of the regional road network. Increased traffic congestion would affect travel times, reducing the efficiency of freight and commercial vehicle operations, network accessibility and affecting the amount of time people can spend with family and friends or undertaking personal activities. Increased delays can also lead to health and wellbeing concerns such as greater, annoyance, stress and anxiety. The Construction Traffic and Access Management Plan (CTAMP) would provide measures to manage and mitigate major road network impacts. The effective implementation of these measures, including the implementation of a Community Communication Strategy aims to ensure all affected and interested parties are informed, to assist in reducing the extent of impacts on the socio-economic environment. The overall impact on the socio-economic environment would be a moderate negative.

Upon operation, the addition of the M4-M5 Link to the broader WestConnex and transport network would improve intersection performance, reduce travel times and increase average speeds across the network. The traffic modelling indicates that by 2033, there would be an overall increase of 499,000 kilometres travelled and a reduction of 46,000 vehicle hours travelled (VHT) on the network. This increase is largely due to the redirection of vehicles (in particular heavy vehicles) from surface roads to the new, faster M4-M5 Link.

While the overall number of hours spent travelling on the network, as a whole would reduce, the changes at a local level are varied. Adjustments to travel times would result in socio-economic impacts such as changes to the time available for recreation, social interaction and economic activities, all of which contribute to the maintenance of physical wellbeing and mental health.

Positive effects are most likely to be experienced by those travelling to or from western Sydney with the substantial improvements at the Wattle Street interchange during both the AM and PM peak periods. This is considered a major positive socio-economic impact as it would reduce travel time and improve access and connectivity for the large number of people living or working within greater western Sydney. This would also support the long-term economic growth of Sydney through improved motorway access and connections linking Sydney's international gateways to key places of businesses.

Despite overall improvements across the broader network, the project would affect the amenity and accessibility of some residential properties and social infrastructure facilities within the study area. These impacts are expected to be minor.

Once operational the broader WestConnex network would be subject to distance-based tolls. Whilst this has the potential to increase congestion on surrounding local roads (toll avoidance), traffic modelling undertaken for this EIS indicates no major shifts in daily forecast traffic onto alternative, parallel routes.

Despite minor reductions in the performance of localised areas of the road network, the operational project is predicted to improve the overall road network across Greater Sydney. The project is expected to deliver reduced travel times, reduce congestion, and decrease travel costs and traffic-related mental and physical health effects. The improvements to the network are considered a major socio-economic positive.

Parking

Changes to parking availability can affect both businesses and individuals through changes to daily routine, level of activity, and passing trade. Permanent reductions in on-street parking can deter visitors from accessing a business or community facility due to an increase in travel time and lack of convenience. It can also affect convenience and accessibility for residents accessing their properties, particularly those who rely on on-street parking.

During construction, the project would result in alterations to parking availability and an increased demand for parking near construction ancillary facilities and other work areas. This may affect the availability of parking for local residents, commuters, businesses and social infrastructure users. For example, the temporary loss of 20 on-street, unrestricted spaces along the western end of Darley Road may affect commuters that park in this area to access the Leichhardt North light rail stop. This would also increase demand for parking spaces on other nearby local streets.

To reduce the impact on the supply of car parking in the various neighbourhoods, construction compounds have been designed to provide around 700 dedicated car parking spaces for construction staff across the study area.

The extent of parking impacts around particular construction compounds would vary depending on the number of workers expected at each site and the availability of suitable alternative public transport options. In higher density areas, such as surrounding the Pyrmont Bridge Road tunnel site, an increase in construction worker would place additional pressure on parking availability. A reduction in the availability of parking on local streets during construction would mainly affect local residents and social infrastructure users, however some businesses may experience slight changes. A detailed construction car parking strategy would form part of the CTAMP and would be developed in consultation with local councils and affected stakeholders adjacent to project sites. The overall impact of construction on parking availability on the socio-economic environment would be minor negative.

The operation of the project would result in a permanent loss of 26 on-street parking spaces in Rozelle along Byrnes, Clubb, Toelle and Callan streets. These are residential streets in close proximity to King George Park in Rozelle. The majority of the 26 parking spaces are outside properties that would be acquired. The removal of these spaces would reduce the convenience of access, affecting a small number of local residents in Rozelle. Overall, the operational effects of the project on parking would be negligible.

Pedestrian and cyclists

Community consultation revealed that the existing active transport network is highly valued by the community.

Alterations to pedestrian and cycle routes have the potential to affect travel times, travel duration, movement patterns and accessibility. These changes can ultimately affect the people's daily routine or the appeal and enjoyment of the active transport network and other social infrastructure. The majority of diversion would not result in significant changes from the existing pedestrian and cyclist environment. To maintain connectivity, all necessary diversions would be in place prior to the removal of existing linkages (including overpass).

The safety and amenity of the pedestrian and cyclist environment would also be affected during construction. The introduction of construction hoardings and ancillary construction infrastructure has the potential to reduce sightlines, create concealed locations or may encourage anti-social behaviour such as graffiti.

A CTAMP would be prepared to ensure that the impact on pedestrian and cyclist networks are minimised and safe movement paths are provided during construction. Impacts would be relatively localised and would respond to mitigation measures (alternate routes, information provision). The overall impact on the socio-economic environment would be minor negative.

During operation, the project would deliver new active transport connections that would enhance access and connectivity for pedestrians and cyclists, particularly around the Rozelle, Annandale and Lilyfield communities. This would provide further socio-economic benefits through increased opportunities for social interaction and community cohesion, reduced car dependency and reduced cost of travel.

The project would link pedestrians and cyclists to popular waterfront and open space areas, such as the proposed open space at Rozelle Rail Yards, Glebe Foreshore, Easton Park, the Bay Run and King George Park in Rozelle. This has the potential to increase patronage for businesses located on Victoria Road, Annandale Street and Darling Street. Pedestrians and recreational and commuter cyclists would enjoy improved amenity (such as a reduction in noise and pollution) due to the location of routes further away from traffic, particularly through the Rozelle Rail Yards.

It is expected that these improvements would result in a significant, long-term change, at a local level, benefiting the suburbs of Annandale, Leichhardt, Lilyfield, Rozelle and Balmain. In addition, such improvements would contribute positively to the regional active transport network with the potential to affect a wider catchment of people. The provision of these additional links may also act as a catalyst for improvements to other active transport networks further afield. The consequence of impact is major, with a high likelihood. Therefore, the significance of impact is considered a major positive.

Public transport network

During construction, bus services in the project corridor and surrounding areas may be affected by the relocation of stops, increases in construction traffic and/or road alterations and delays. Community, stakeholder and business consultation identified changes to public transport as a concern. The business survey respondents suggested that about 16 per cent of staff and customers rely on public transport to access businesses within the study area.

The construction of the project would not directly affect heavy rail or light rail services. Passenger access to stations within or in proximity to the study area may however be affected by temporary traffic changes and congestion or an increase in competition for parking, arising from the presence of construction works. Access to light rail stops at Leichhardt North, Lilyfield and Rozelle Bay would be maintained during construction.

Impacts upon bus routes would likely be temporary and confined to certain routes only, with impacts managed and mitigated where possible through the CTAMP. Any changes to bus stops and bus services would be undertaken in consultation with Transport for NSW and the bus service provider, with relevant information being communicated to bus users. Overall, construction would have a slight consequence on public transport, with socio-economic effects possible. The overall significance of impact upon the socio-economic environment would be minor negative.

Upon operation, bus stops would be reinstated generally in the same location as existing. The project would complement the delivery of an integrated public transport approach, creating more capacity on the roads, which may facilitate other transport projects such as dedicated bus lanes. Bus services along Parramatta Road would improve, which would contribute to increased convenience for users, particularly commuters.

The travel time savings and time delays across the public transport network generally are considered minor (less than 10 minutes for each) and unlikely to deter a person from using public transport or result in any substantial impact upon a person's quality of life. As such, the proposed operational changes to the public transport network is considered to have a minor positive impact on the socio-economic environment.

Local amenity

Amenity is generally associated with the pleasantness of an area, but also has a physical (or tangible) component. This includes the character and appearance of buildings, proximity to commercial or

recreational facilities, quality infrastructure and absence of noise, unsightliness or offensive odours. It also has a psychological or social component.

The construction and operation of the project have the potential to alter the local amenity and character of residential streets, businesses and social infrastructure. The amenity of an area directly influences where individuals choose to live, recreate, work and shop.

Noise and vibration

Amenity impacts arising from construction noise are anticipated to have a considerable effect on the socio-economic environment. Construction noise, particularly at night, has the capacity to affect human health, cause sleep disturbance, effect the function and operation of businesses and the ability for people to enjoy an environment. In order to mitigate these impacts, measures such as acoustic sheds, architectural treatment and noise walls would be put in place where feasible and reasonable. An independent acoustic advisor would also be employed to ensure rigor in noise assessments and assist with ensuring compliance is achieved as per assessment recommendations.

As the project involves tunnelling, ground-borne noise impacts may also be experienced during construction. Considering the roadheader works would be progressing around 20 to 25 metres per week, it is anticipated that ground-borne noise impacts would be experienced for a short duration at any one location. Tunnelling works would however occur 24 hours a day with worst-case predictions primarily affecting residential receivers.

The presence of construction noise would result in a medium change from the existing environment. The implementation of noise mitigation measures and a Community Communication Strategy that continues to inform and notify residents and businesses about potential noise exceedances and the anticipated duration of these activities is recommended. The severity of impact on individual receivers would vary depending on their proximity from the construction sites. The likelihood and severity of impact would dissipate the further the receiver is from the construction site, minimising noise impacts upon the majority of the study area. As such the overall impact on the socio-economic environment would be moderate negative.

The operation of large rock-breakers has the potential to generate some of the most substantial construction vibration impacts. Generally, the separation distances between the proposed works and the nearest receiver(s) would be sufficient to prevent cosmetic damage. In some circumstances however, there may be instances where vibration-generating construction activities are required to be undertaken within the minimum working distances where cosmetic building damage may occur. Households, businesses and social infrastructure providers that are identified as being within the minimum working distance for potential cosmetic damage may experience heighted levels of stress and anxiety during construction activities due to the uncertainty and concern for their properties.

People can perceive vibration levels well below those likely to cause damage to building contents or affect the structural integrity of buildings. These vibrations would affect human comfort causing annoyance or disturbance, leading to an elevation of a person's stress and anxiety levels. Impacts upon human comfort would be intermittent across the duration of the project and occur over short periods (generally up to one week at any one location) and as such are not expected to result in significant socio-economic impacts.

The implementation of the Community Communication Strategy and the Construction Noise and Vibration Management Plan should effectively manage and reduce the extent of impacts from noise and vibration on households, businesses and social infrastructure and reduce overall levels of uncertainty. The impact would be more severe at a locality level, however would dissipate the further the receiver is from the construction site. With consideration of these factors, the overall impact on the socio-economic environment would be minor negative.

Once operational the project is predicted to result in a reduction in noise levels for around 60 per cent of the receivers within the study area and reduce the number of receivers with an exceedance of the Noise Criteria Guidelines (NCG) criteria within the study area, in both the day and night-time periods. Impacts would be medium-long term and would affect residents, businesses and social infrastructure in the Inner West local government area, and visitors to businesses and social infrastructure from across Greater Sydney Region. The change from the existing baseline environment would be small.

This consequence would be slight and the likelihood high. As such, the impact is considered a moderate positive.

Two hundred buildings have been identified as likely to have exceedances of operational road traffic noise criteria in both daytime and night-time. Some of these buildings currently experience exceedances of acceptable noise levels due to the presence of existing road traffic. Mitigation measures would be implemented to reduce noise levels for these properties. The effect would be medium-long term and likely to affect residents, business, social infrastructure and visitors across Greater Sydney Region. The consequence of change would be moderate with a high likelihood. As such, the significance of impact is considered to be moderate negative.

Operational ground-borne noise and vibration due to the movement of cars and trucks inside the tunnel is not expected to cause any noticeable impact at the surface level properties. Therefore, upon operation, the significance of impact on the existing socio-economic environment would be negligible.

Visual amenity

During construction, visual amenity throughout the study area would be affected by factors such as the removal of established vegetation, the installation of construction hoardings, installation of acoustic sheds, construction equipment and/or the visual appearance of construction sites. These impacts would affect the appeal of external and internal living spaces and reduce the overall amenity of an environment. Visual amenity impacts as a result of construction would be generally restricted to the local scale. The removal of trees and the introduction of construction sites would reduce the privacy of some properties and reduce screening of construction activities. Visual impacts on local amenity would be medium-long term in nature, with the severity of change from the existing environment medium and generally confined to locality level. The overall impact on the socio-economic environment would be moderate negative.

The operation of the project would result in changes to local visual amenity due to the removal and addition of infrastructure, landscaping and other urban design features. Changes to the landscape character or the visual amenity of a street or suburb can affect the sense of belonging and identity of its residents and visitors and consequently the sense of community cohesion.

The built form components of the project would result in alterations to existing views for a number of residential properties. Some of these views would be altered due to the addition of project components to the environment, including ventilation facilities and outlets, water treatment plants, electricity substations, air intake facilities and tunnel portals.

The operation of the project would result in the potential for view loss to the city skyline views and partial loss to Rozelle Bay or Glebe Point. This loss of views may have direct impacts on the amenity of the location and quality of life. However, new transport infrastructure would improve views for numerous properties in Lilyfield who presently overlook the industrial buildings of the Rozelle Rail Yards. The visual character and identity of Rozelle, Lilyfield and St Peters would be permanently altered from the baseline existing conditions. Upon operation, the significance of impact on the socio-economic environment would be minor negative.

Air quality

Construction activities such as demolition, earthworks, construction and track-out activities have the capacity to increase dust, air emissions and odour. This has the potential to affect human health, reduce the amenity of an area and generate nuisance dust impacts due to the increase in dust deposition (dust soiling) potentially deterring people from using spaces, visiting businesses or enjoying residential amenity.

The demolition of buildings has a greater capacity to trigger human health impacts due to the potential release of hazardous fibres, heavy metals, or fungal spoils. This EIS considers a worst-case scenario and deems that significant impacts on human health can generally be avoided or minimised through appropriate and commonly applied mitigation measures.

Air quality from construction activities, including spoil haulage and construction traffic was identified as a significant concern during public consultation. Construction activities are anticipated to produce dust, with the capacity to adversely affect human receptors and the function and operating costs of businesses. Mitigation measures to manage dust would be incorporated into the Construction Air

Quality Management Plan, which would reduce the majority of dust effects. As construction dust impacts can generally be managed through appropriate mitigation measures, the changes in air quality as a result of the project would likely be small. There may be a higher likelihood of nuisance dust at a locality level around construction compounds on dry weather days with the wind blowing towards a receptor. Any effects would be temporary and short-lived, with the significance of impact on the socio-economic environment negligible.

The amenity impacts on residents, social infrastructure and businesses would result in a change to the existing baseline environment, however would respond to management and mitigation measures. Effective and ongoing engagement regarding expected changes in amenity would assist in mitigating any stress and anxiety from uncertainty and potentially increase the tolerance levels of affected communities.

During operation, changes to air quality both inside and outside of the tunnels would result in no discernible positive or negative effects to human health or local amenity. Therefore, the operational socio-economic air quality impacts are considered negligible.

Economy

Large transport infrastructure projects, such as this project, generate significant revenue for local and regional economies and stimulate employment opportunities and investment during both construction and operation.

Construction activity directly benefits the economy, injecting economic stimulus benefits into the local, regional and state economies. The economic benefit of construction is multi-dimensional, including increased expenditure at local and regional businesses through purchases by construction workers, direct employment through on-site construction activities, direct expenditure associated with on-site construction activities and indirect employment and expenditure through the provision of goods and services required for construction.

It is estimated that based on a five-year construction period, around 14,300 direct (onsite) job years would be created between 2018 to 2023, which is equivalent to around 2,800 jobs per annum. Furthermore, about 42,300 indirect (off-site) job years would be generated, equivalent to around 8,400 jobs per annum based on the project period.

The economic multipliers also estimate that construction would generate a further $5.8 billion of activity in production induced effects and $7.7 billion in consumption induced effects. Total economic activity generated by the construction of the proposed development would be about $19.7 billion.

The economic contribution of the project to the local and regional economy is significant, resulting in major positive socio-economic benefits.

Upon operation, the transport and traffic modelling conducted for the project highlighted that there would be substantial benefits for freight and commercial vehicle movements due to the operation of the M4-M5 Link. The subsequent effects of the operation of the M4-M5 Link on business productivity include:

- Reduced cost for commercial and freight movements
- Increased productivity from reduced congestion and travel times for commercial and freight movements
- Increased economic output as a result of increased efficiency in freight and commercial vehicle movements.

For freight road users, the project would deliver important improvements to the existing situation for a large number of businesses within the region. Effects would be long-term, and benefit the Greater Sydney Region. The significance of impact on the socio-economic environment would be major positive.

For commuters, operation of the project would lead to a more reliable road network, reducing commuting time and lowering vehicle operating costs. Effects would be long term, and benefit the Greater Sydney Region, particularly residents and businesses in western Sydney. This would result in a large change in baseline conditions. The consequence of impact would be major and the likelihood

would be near certain. The significance of impact on the socio-economic environment would be major positive.

Although tolling would be a cost to individuals, the benefits of tolling to the broader economy is a greater socio-economic consequence. Effects would be long-term and benefit the Greater Sydney Region. The change from existing baseline environment would be large. The consequence of change would be major and the likelihood of effects is possible. The significance of impact on the socio-economic environment would be moderate positive

Property impacts

The M4-M5 Link project would predominantly be a sub-surface project, with the mainline tunnel running from Haberfield through to St Peters. In order to facilitate the project, however, a number of property acquisitions are required for:

- Construction of new structures, including tunnel portals and ventilation facilities
- Construction compounds for machinery operation and storage, construction activity coordination and construction parking
- Road widening of existing connections or construction of new motorway connections.

The project requires the acquisition of properties that contain residential, business and social infrastructure uses. Twenty-six residential properties would be acquired and 48 businesses would be required to close down or relocate. One park (Buruwan Park in Annandale) would also be permanently acquired and one other temporarily leased (King George Park in Rozelle).

The social risks related to land acquisition for both property owners and tenants may include:

- Inaccessibility of equivalent housing at a comparable cost. If compensation does not allow property owners and tenants to access similar housing in the local area, acquisition may result in resident's relocation to other more affordable areas or incurring increased levels of debt to remain in the area.
- Relocation health risks. Relocation can be emotionally and physically taxing process. Vulnerable members of the community, including the frail, elderly, people with a disability or poor health and those with low English language skills may be most at risk of stress and in need of support when relocation.
- Altered access to social infrastructure. If acquisition results in households needing to move to other areas, this may affect continuing access to social services, family and local social networks.

All acquisition required for the project would be undertaken in accordance with *the Land Acquisition (Just Terms Compensation) Act 1991* (NSW), the *Land Acquisition Information Guide* (NSW Government 2014) and the land acquisition reforms announced by the NSW Government in 2016. A Business Management Plan would also be developed to support businesses through the change.

Overall, the number of acquisitions proposed to facilitate the project is relatively low for an infrastructure project of this scale. The impact on individuals and businesses would be major, however somewhat mitigated by the implementation of a detailed consultation and advice process, as per the NSW Land Acquisition (Just Terms Compensation) reform. Property acquisitions are generally determined early in the process with property owners and tenants notified. Businesses and households are generally re-established in their new homes or locations within the short-medium term. The overall impact of construction activities on the socio-economic environment is a moderate negative.

Business

Changes in access and amenity are anticipated across the study area and may affect businesses during construction. This may be due to the introduction of construction sites to an environment or modifications and changes to the transport network.

As the sensitivity of business clusters varies dependent on the level of service provision they provide (ie serve a local, district or regional trade catchments) and how sensitive the businesses are to changes in amenity and accessibility, the ability of a business to adapt to an environment can affect

business viability and turnover. The businesses vulnerability to an impact can deteriorate more quickly dependent on the duration and severity of exposure to construction activities.

Businesses repeatedly exposed to construction activities may be more susceptible to construction fatigue, which can have direct social and economic consequences, particularly if the business is already struggling to remain operational. Although numerous business clusters are likely to experience a change to the baseline socio-economic condition, in terms of the spatial extent of business impact across the broader region, construction effects are relatively localised. A number of convenience and food and beverage businesses, in close proximity to the construction sites, may in fact benefit from increased passing trade due to the additional construction workers in the locality.

To minimise the consequence and likelihood of impacts on businesses, a Business Management Plan is recommended to manage, minimise and avoid potential construction effects.

The duration of construction effects on businesses would be for a medium-long term with the severity of change from the existing baseline condition being medium. Effects on businesses are generally localised or limited to a suburb extent. The likelihood of construction affecting business operations is possible, with the consequence minor. Considering this, the overall impact of construction activities on the socio-economic environment is a minor negative.

Social infrastructure

Changes in access and amenity for some social infrastructure facilities are anticipated during construction. These may arise from the introduction of construction sites to an environment or modifications and changes to the transport network.

Changes in amenity can affect how users interact with, or enjoy an environment, or their ability to participate and concentrate. The sensitivity of a social infrastructure user to a construction impact would vary depending on proximity to the construction activity, the individual's sensitivity to the construction impact (ie noise, dust, vibration) and the duration of the activity.

The consequence of changes to access would vary across the spectrum of social infrastructure users, depending on what service or activity is undertaken at the facility. For instance, active sporting facilities, schools and hospitals may require good vehicle access to sustain these facilities. Access to these facilities during construction or operation, may be affected by delays or diversions and a reduction in the availability of car parking. A reduction in the convenience of access to social infrastructure may also deter users and potentially affect community participation levels, which would have an indirect impact on community values.

The assessment identifies a 17 social infrastructure facilities including, childcare and education facilities, places of worship and outdoor recreation areas that are in close proximity to construction compounds, which are more likely to experience a substantial change to the existing environment. Although there are other social infrastructure facilities in the broader study area, it was found that during construction, socio-economic impacts from construction would be less likely on these facilities. To minimise the consequence and likelihood of impacts on social infrastructure, a Social Infrastructure Plan is recommended to manage, minimise and avoid potential construction effects.

Although 17 social infrastructure facilities are likely to experience a change to the baseline socio-economic condition, in terms of the spatial extent of construction impact, effects are relatively localised. The duration of possible effects would be for a medium-long term with the severity of change from the existing baseline condition medium for facilities in close proximity, too small for those further away. There is a high likelihood that construction effects would influence the operation of some social infrastructure facilities and the experience of users. The likelihood and consequence of potential impacts on social infrastructure would reduce the further the facility is from the construction site. Considering this, the overall significance of impact on the socio-economic environment is a moderate negative.

The operation of the project would provide increased access to open space and pedestrian and cyclist connections, which would provide increased opportunities for the community to meet and interact. The Rozelle Rail Yards currently act as a substantial physical barrier between the communities of Annandale, Rozelle and Lilyfield. On operation, the Rozelle Rail Yards would be transformed into

public open space integrated with a network of active and transport links (both north–south and east–west), which would improve community cohesion.

The project would provide pedestrian bridges, which would increase the opportunities for communities to connect and interact, contributing to community and social cohesion. A new pedestrian footpath and separated cycleway would be provided between Springside Street and the Bay Run at Byrnes Street on the western side of Victoria Road. A pedestrian and cycle 'land bridge' at the Rozelle Rail Yards would provide a north-south connection between Bicentennial Park, the Rozelle Rail Yards and beyond to Easton Park benefitting the communities in Annandale/Glebe and Rozelle.

The delivery of a substantial area of open space within the Rozelle Rail Yards would be a significant positive benefit to the socio-economic environment.

Future land use

Land required for the construction of the project that is not required for operation would be identified following detailed design and construction planning and is termed 'remaining project land' and would then be broken down further into:

- Land to be retained for future (separate) road infrastructure projects
- Residual land – land required for the construction of the project that is not required for operation or for future (separate) infrastructure projects.

The uncertainty around this future land use may cause residents and business stress and/or anxiety. This may affect where an individual or business chooses to live or operate. Remaining project land and its management would be identified in the Residual Land Management Plan.

Future use would be decided by Roads and Maritime, and any future development would be subject to separate development assessment and approval. Of note is that the project would not rezone or consolidate remaining project land and therefore there would be no changes to land use zoning for future development.

Land subject to the Residual Land Management Plan would include the Parramatta Road West civil and tunnel site (C1b), the Parramatta Road East civil site (C3b) and the Pyrmont Bridge Road tunnel site (C9).

Detailed landscape plans would be prepared as part of the Urban Design and Landscape Plan (UDLP) for the project. Land subject to UDLP would include the Darley Road surface works, Rozelle surface works, Iron Cove Link surface works and St Peters interchange surface works. This would include the delivery of new open space at the Rozelle Rail Yards, as well as new and enhanced active transport links, which would enable the site to be used by the community at large.

Cumulative impacts

Several concurrent construction projects in the vicinity of the project have the potential to contribute to a cumulative impact alongside those of the project. These may result in increased instantaneous impacts such as traffic or increased construction fatigue over time, particularly those in close proximity to the construction sites. These projects include the M4 Widening (Parramatta to Homebush), New M5 (Beverly Hills to St Peters), CBD and South East Light Rail, F6 Extension, Sydney Metro City and Southwest, Western Harbour Tunnel and Beaches Link, Parramatta Road Transformation Project and The Bays Precinct redevelopment. In particular, various sections of the Rozelle Rail Yards are proposed to be used for an extended period as construction and management sites for the M4-M5 Link (Rozelle interchange), the CBD and South East Light Rail and the Western Harbour Tunnel and Beaches Link. The neighbourhoods of Ashfield, Haberfield and St Peters, which are located in proximity to the New M4 and M4 East projects would also experience ongoing effects of construction.

An important consideration of cumulative impacts on the socio-economic environment is construction fatigue. This relates to receivers that experience construction impacts from a variety of projects over an extended period of time with few or no breaks between construction periods. Construction fatigue can be brought on through traffic and access disruptions, increased noise and vibration, and reductions in air quality or visual amenity. This may result in health impacts such as increased stress and anxiety due to uncertainty around timing and ongoing use of the sites. It can also cause financial

hardship to businesses and industries as concentrated and ongoing construction effects reduce the efficiency of servicing and deliveries and/or the productivity of employees.

Conversely, businesses and the broader industry would benefit from consecutive construction activities with increased employment opportunities, potentially increased passing trade from construction workers and enhanced demand for construction related industries.

In order to minimise the cumulative impacts on the community from these projects, collaboration and coordination between the various agencies and stakeholders would be key. Consideration should be given to the creation of a project working group, or equivalent to guide key stages of the several projects with the aim of managing socio-economic impacts and disruptions and, importantly, keeping the community informed.

Mitigation measures would be put in place to minimise the impacts and disruptions to affected parties. This would include the implementation of on-going consultation throughout the construction period.

1 Introduction

NSW Roads and Maritime Services (Roads and Maritime) is seeking approval to construct and operate the WestConnex M4-M5 Link (the project), which would comprise a new multi-lane road link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters. The project would also include an interchange at Lilyfield and Rozelle (the Rozelle interchange) and a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge (Iron Cove Link). In addition, construction of tunnels, ramps and associated infrastructure to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project would be carried out at the Rozelle interchange.

Together with the other components of the WestConnex program of works and the proposed future Sydney Gateway, the project would facilitate improved connections between western Sydney, Sydney Airport and Port Botany and south and south-western Sydney, as well as better connectivity between the important economic centres along Sydney's Global Economic Corridor and local communities.

Approval is being sought under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) for the project. A request has been made for the NSW Minister for Planning to specifically declare the project to be State significant infrastructure and also critical State significant infrastructure. An environmental impact statement (EIS) is therefore required.

1.1 Overview of WestConnex and related projects

The M4-M5 Link is part of the WestConnex program of works. Separate planning applications and assessments have been completed for each of the approved WestConnex projects. Roads and Maritime has commissioned Sydney Motorway Corporation (SMC) to deliver WestConnex, on behalf of the NSW Government. However, Roads and Maritime is the proponent for the project.

In addition to linking to other WestConnex projects, the M4-M5 Link would provide connections to the proposed future Western Harbour Tunnel and Beaches Link, the Sydney Gateway (via the St Peters interchange) and the F6 Extension (via the New M5).

The WestConnex program of works, as well as related projects, are shown in **Figure 1-1** and described in **Table 1-1**.

Table 1-1 WestConnex and related projects

Project	Description	Status
WestConnex program of works		
M4 Widening	Widening of the existing M4 Motorway from Parramatta to Homebush.	Planning approval under the EP&A Act granted on 21 December 2014. Open to traffic.
M4 East	Extension of the M4 Motorway in tunnels between Homebush and Haberfield via Concord. Includes provision for a future connection to the M4-M5 Link at the Wattle Street interchange.	Planning approval under the EP&A Act granted on 11 February 2016. Under construction.
King Georges Road Interchange Upgrade	Upgrade of the King Georges Road interchange between the M5 West and the M5 East at Beverly Hills, in preparation for the New M5 project.	Planning approval under the EP&A Act granted on 3 March 2015. Open to traffic.
New M5	Duplication of the M5 East from King Georges Road in Beverly Hills with tunnels from Kingsgrove to a new interchange at St Peters. The St Peters interchange allows for connections to the proposed future Sydney Gateway project and an underground connection to the M4-M5 Link. The New M5 tunnels also include provision for a future connection to the proposed future F6 Extension.	Planning approval under the EP&A Act granted on 20 April 2016. Commonwealth approval under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) granted on 11 July 2016. Under construction.

Project	Description	Status
M4-M5 Link (the project)	Tunnels connecting to the M4 East at Haberfield (via the Wattle Street interchange) and the New M5 at St Peters (via the St Peters interchange), a new interchange at Rozelle and a link to Victoria Road (the Iron Cove Link). The Rozelle interchange also includes ramps and tunnels for connections to the proposed future Western Harbour Tunnel and Beaches Link project.	The subject of this EIS.
Related projects		
Sydney Gateway	A high-capacity connection between the St Peters interchange (under construction as part of the New M5 project) and the Sydney Airport and Port Botany precinct.	Planning underway by Roads and Maritime and subject to separate environmental assessment and approval.
Western Harbour Tunnel and Beaches Link	The Western Harbour Tunnel component would connect to the M4-M5 Link at the Rozelle interchange, cross underneath Sydney Harbour between the Birchgrove and Waverton areas, and connect with the Warringah Freeway at North Sydney. The Beaches Link component would comprise a tunnel that would connect to the Warringah Freeway, cross underneath Middle Harbour and connect with the Burnt Bridge Creek Deviation at Balgowlah and Wakehurst Parkway at Seaforth. It would also involve the duplication of the Wakehurst Parkway between Seaforth and Frenchs Forest.	Planning underway by Roads and Maritime and subject to separate environmental assessment and approval.
F6 Extension	A proposed motorway link between the New M5 at Arncliffe and the existing M1 Princes Highway at Loftus, generally along the alignment known as the F6 corridor.	Planning underway by Roads and Maritime and subject to separate environmental assessment and approval.

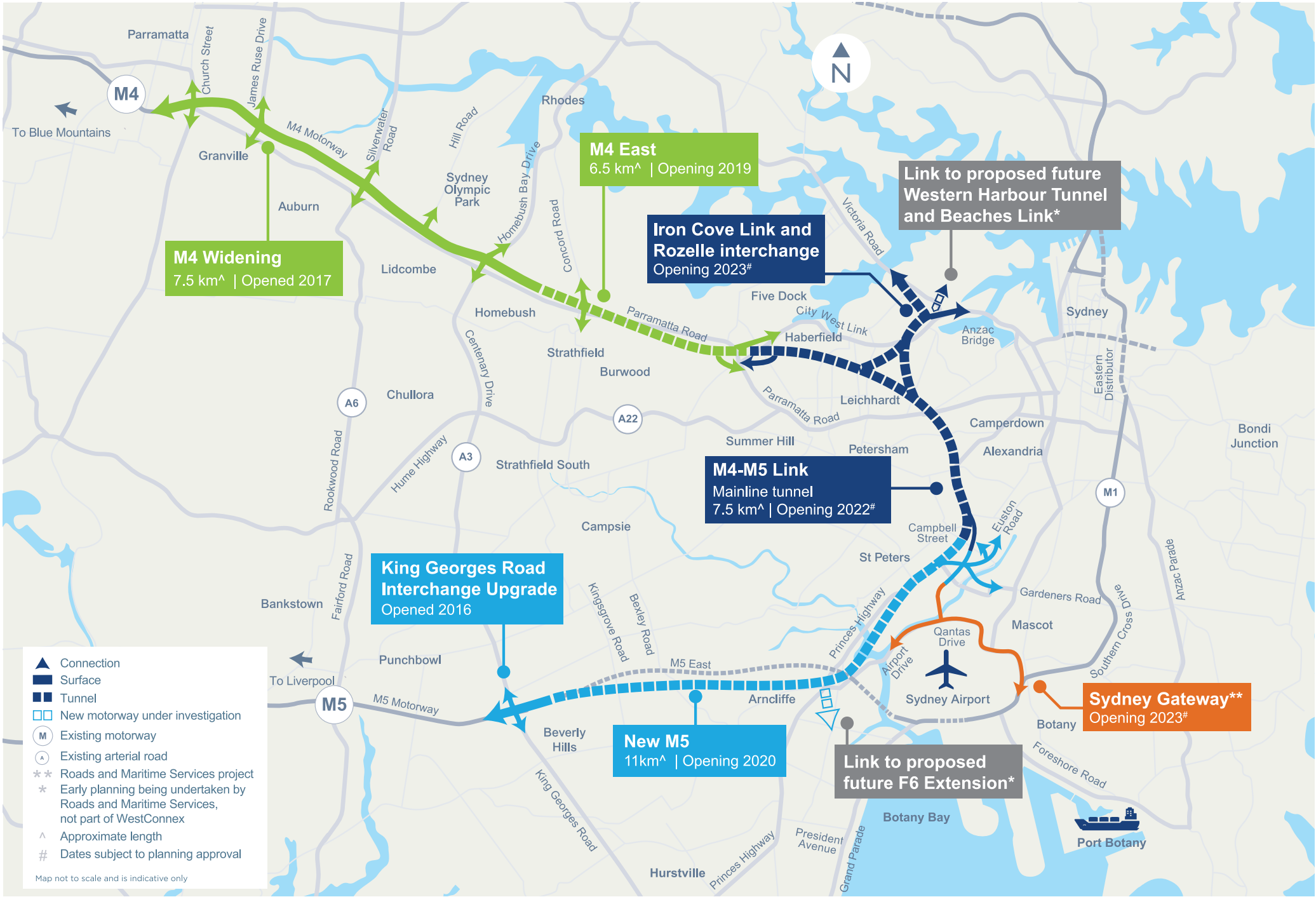

Figure 1-1 Overview of WestConnex and related projects

1.2 Purpose of this report

The purpose of this socio-economic impact assessment (SEIA) is to identify and assess the social, economic and business impacts that may result from the project during construction and operation. This report considers the direct, indirect and cumulative social, economic and business impacts that may affect residential communities (directly and indirectly affected, local and regional), businesses, users of roads, public open space, social infrastructure, and other key stakeholders. This report assesses consequence and likelihood of impacts and identifies mitigation strategies to minimise adverse impacts and maximise benefits of the project. In doing so, it responds directly to the Secretary's Environmental Assessment Requirements (SEARs) as outlined in **section 1.3**. This report is one of a number of technical documents that form part of the WestConnex M4-M5 Link EIS.

1.3 SEARs

Table 1-2 Relevant SEARs addressed in this report

Secretary's Environmental Assessment Requirements		
Socio-economic, Land Use and Property		
Desired performance outcome	**Requirement**	**Where addressed**
2. Environmental Impact Statement The project is described in sufficient detail to enable clear understanding that the project has been developed through an iterative process of impact identification and assessment and project refinement to avoid, minimise or offset impacts so that the project, on balance, has the least adverse environmental, social and economic impact, including cumulative impacts.	1. The EIS must include, but not necessarily be limited to, the following: (h) A concise description of the general biophysical and socio-economic environment that is likely to be impacted by the project (including offsite impacts). Elements of the environment that are not likely to be affected by the project do not need to be described.	The socio-economic environment is described in **Chapter 5**.
3. Assessment of key issues Key issue impacts are assessed objectively and thoroughly to provide confidence that the project would be constructed and operated within acceptable levels of impact.	2. For each key issue the Proponent must: a) Describe the biophysical and socio-economic environment, as far as it is relevant to that issue, including adequate baseline data, in terms of temporal, spatial and parameters monitored.	The socio-economic environment is described in **Chapter 5**.
	b) Describe the legislative and policy context, as far as it is relevant to the issue.	The legislative and policy context is described in **Chapter 4**.

Secretary's Environmental Assessment Requirements		
Socio-economic, Land Use and Property		
Desired performance outcome	**Requirement**	**Where addressed**
	c) Identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence of the impact (comprehensive risk assessment), and the cumulative impacts of: (i) concurrent project construction activities; and (ii) proposed and approved projects (where information is available at the time of writing).	The impacts associated with the project have been identified, described as quantified (if possible), including assessing the likelihood and consequence of the impact, in **Chapter 7**, **Chapter 8** and **Chapter 9**.
	d) Demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies).	Potential impacts that have been avoided through design have been outlined at the beginning of **Chapter 7** and **Chapter 8**.
	e) Detail how likely impacts that have not been avoided through design would be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant).	The assessment of the impacts and how they may be avoided, minimised, managed or mitigated is provided in **Chapter 7** (Construction), **Chapter 8** (Operation).
	f) Detail how any residual impacts would be managed or offset, and the approach and effectiveness of these measures.	Detail regarding management measures and residual impact management is provided in **Chapter 10**.
9. Socio-economic, Land Use and Property The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities. The project minimises impacts on property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure.	1. The Proponent must assess social and economic impacts (of all phases of the project) in accordance with the current guidelines (including cumulative ongoing impacts of the proposal).	Construction impacts are assessed in accordance with the current guideline in **Chapter 7**, operational impacts in **Chapter 8** and cumulative impacts are assessed in **Chapter 9**.
	2. The Proponent must assess impacts from construction and operation on potentially affected property (including Crown lands), businesses, recreational users and land and water users, including property acquisitions/adjustments, access amenity, relevant statutory rights, and community severance and barrier impacts resulting from the project.	**Chapter 12** (Land use and property) of the EIS identifies direct impacts on properties. **Chapter 7** and **Chapter 8** assess impacts from construction and operation on potentially affected property (including Crown lands), businesses, recreational users and land and water users, including property acquisitions/adjustments, access amenity, relevant statutory rights, and community severance

Secretary's Environmental Assessment Requirements		
Socio-economic, Land Use and Property		
Desired performance outcome	**Requirement**	**Where addressed**
		and barrier impacts resulting from the project.
	3. The Proponent must identify opportunities for local centre street revitalisation improvements, pedestrian and cyclist access and connectivity and provision of community and social facilities.	Local centre street revitalisation improvements are identified in **Appendix L** (Technical working paper: Urban Design) of the EIS Pedestrian and cyclist access and connectivity and provision of community and social facilities are identified in **Appendix N** (Technical working paper: Active transport strategy) of the EIS and **Chapter 12** (Land use and property) of the EIS.
	4. The design and siting of project elements should be located in such a way that functional, contiguous areas of residual land are maximised. The design and siting must consider appropriate land use interfaces (i.e. White Bay) and the social and economic impacts of proposed land uses against alternate land uses.	An assessment of the social and economic impacts of proposed land uses is included in **Chapter 8**.
	5. Where air quality allows, residual land must be designed to positively contribute to additional community uses, public recreation uses and/or affordable or social housing. Passively landscaped areas should not be the default use for residual land.	Provided in **Chapter 12** (Land use and property) of the EIS.
	6. The Proponent must assess potential impacts on utilities (including	An assessment of utility impacts is provided in

Secretary's Environmental Assessment Requirements		
Socio-economic, Land Use and Property		
Desired performance outcome	**Requirement**	**Where addressed**
	communications, electricity, gas, and water and sewerage) and the relocation of these utilities.	**section 7.7**.
	7. Where the project is predicted to affect trunk utilities, the Proponent must undertake a utilities management strategy. The strategy must identify proposed management strategies, including relocations or adjustment of the utilities, and their estimated timing and duration. This strategy must be developed in consultation with the relevant utility owners or providers.	Refer to the Utility Management Strategy (**Appendix F**) of the EIS.

1.4 Structure of this report

This report is structured as follows:

Chapter 1: Introduction – outlines the project and presents the purpose of the report

Chapter 2: The project – describes the key features of the project and the associated construction activities

Chapter 3: Assessment methodology – describes the methodology employed for the SEIA

Chapter 4: Relevant guidelines and policies – overviews the strategic and statutory policies and strategies relevant to the social and economic assessment of the project

Chapter 5: Existing environment – presents the current social, business and economic characteristics of the study area

Chapter 6: Consultation and community values – outlines the key socio-economic issues and community values identified through consultation with key stakeholders, businesses and the community and identifies where these issues are addressed in the report

Chapter 7: Assessment of construction impacts – describes the potential socio-economic impacts resulting from the construction of the project

Chapter 8: Assessment of operational impacts – describes the potential socio-economic impacts resulting from the operation of the project

Chapter 9: Assessment of cumulative impacts – describes the potential cumulative impacts resulting from the operation of the project

Chapter 10: Mitigation and management – provides a summary of recommended environmental mitigation, management and monitoring responsibilities in relation to the socio-economic impacts of the project

Chapter 11: Conclusion

Annexure A: Business survey report

2 The project

2.1 Project location

The project would be generally located within the City of Sydney and Inner West local government areas (LGAs). The project is located about two to seven kilometres south, southwest and west of the Sydney central business district (CBD) and would cross the suburbs of Ashfield, Haberfield, Leichhardt, Lilyfield, Rozelle, Annandale, Stanmore, Camperdown, Newtown and St Peters. The local context of the project is shown in **Figure 2-1**.

2.2 Overview of the project

Key components of the project are shown in **Figure 2-1** and would include:

- Twin mainline motorway tunnels between the M4 East at Haberfield and the New M5 at St Peters. Each tunnel would be around 7.5 kilometres long and would generally accommodate up to four lanes of traffic in each direction
- Connections of the mainline tunnels to the M4 East project, comprising:
  - A tunnel-to-tunnel connection to the M4 East mainline stub tunnels east of Parramatta Road near Alt Street at Haberfield
  - Entry and exit ramp connections between the mainline tunnels and the Wattle Street interchange at Haberfield (which is currently being constructed as part of the M4 East project)
  - Minor physical integration works with the surface road network at the Wattle Street interchange including road pavement and line marking
- Connections of the mainline tunnels to the New M5 project, comprising:
  - A tunnel-to-tunnel connection to the New M5 mainline stub tunnels north of the Princes Highway near the intersection of Mary Street and Bakers Lane at St Peters
  - Entry and exit ramp connections between the mainline tunnels and the St Peters interchange at St Peters (which is currently being constructed as part of the New M5 project)
  - Minor physical integration works with the surface road network at the St Peters interchange including road pavement and line marking
- An underground interchange at Leichhardt and Annandale (the Inner West subsurface interchange) that would link the mainline tunnels with the Rozelle interchange and the Iron Cove Link (see below)
- A new interchange at Lilyfield and Rozelle (the Rozelle interchange) that would connect the M4-M5 Link mainline tunnels with:
  - City West Link
  - Anzac Bridge
  - The Iron Cove Link (see below)
  - The proposed future Western Harbour Tunnel and Beaches Link
- Construction of connections to the proposed future Western Harbour Tunnel and Beaches Link project as part of the Rozelle interchange, including:
  - Tunnels that would allow for underground mainline connections between the M4 East and New M5 motorways and the proposed future Western Harbour Tunnel and Beaches Link (via the M4-M5 Link mainline tunnels)
  - A dive structure and tunnel portals within the Rozelle Rail Yards, north of the City West Link / The Crescent intersection
  - Entry and exit ramps that would extend north underground from the tunnel portals in the Rozelle Rail Yards to join the mainline connections to the proposed future Western Harbour

Tunnel and Beaches Link

- A ventilation outlet and ancillary facilities as part of the Rozelle ventilation facility (see below)

· Twin tunnels that would connect Victoria Road near the eastern abutment of Iron Cove Bridge and Anzac Bridge (the Iron Cove Link). Underground entry and exit ramps would also provide a tunnel connection between the Iron Cove Link and the New M5 / St Peters interchange (via the M4-M5 Link mainline tunnels)

· The Rozelle surface works, including:

- Realigning The Crescent at Annandale, including a new bridge over Whites Creek and modifications to the intersection with City West Link

- A new intersection on City West Link around 300 metres west of the realigned position of The Crescent, which would provide a connection to and from the New M5/St Peters interchange (via the M4-M5 Link mainline tunnels)

- Widening and improvement works to the channel and bank of Whites Creek between the light rail bridge and Rozelle Bay at Annandale, to manage flooding and drainage for the surface road network

- Reconstructing the intersection of The Crescent and Victoria Road at Rozelle, including construction of a new bridge at Victoria Road

- New and upgraded pedestrian and cyclist infrastructure

- Landscaping, including the provision of new open space within the Rozelle Rail Yards

· The Iron Cove Link surface works, including:

- Dive structures and tunnel portals between the westbound and eastbound Victoria Road carriageways, to connect Victoria Road east of Iron Cove Bridge with the Iron Cove Link

- Realignment of the westbound (southern) carriageway of Victoria Road between Springside Street and the eastern abutment of Iron Cove Bridge

- Modifications to the existing intersections between Victoria Road and Terry, Clubb, Toelle and Callan streets

- Landscaping and the establishment of pedestrian and cycle infrastructure

· Five motorway operations complexes; one at Leichhardt (MOC1), three at Rozelle (Rozelle West (MOC2), Rozelle East (MOC3) and Iron Cove Link (MOC4)), and one at St Peters (MOC5). The types of facilities that would be contained within the motorway operations complexes would include substations, water treatment plants, ventilation facilities and outlets, offices, on-site storage and parking for employees

· Tunnel ventilation systems, including ventilation supply and exhaust facilities, axial fans, ventilation outlets and ventilation tunnels

· Three new ventilation facilities, including:

- The Rozelle ventilation facility at Rozelle

- The Iron Cove Link ventilation facility at Rozelle

- The Campbell Road ventilation facility at St Peters

· Fitout (mechanical and electrical) of part of the Parramatta Road ventilation facility at Haberfield (which is currently being constructed as part of M4 East project) for use by the M4-M5 Link project

· Drainage infrastructure to collect surface and groundwater for treatment at dedicated facilities. Water treatment would occur at

- Two operational water treatment facilities (at Leichhardt and Rozelle)

- The constructed wetland within the Rozelle Rail Yards

- A bioretention facility for stormwater runoff within the informal car park at King George Park at Rozelle (adjacent to Manning Street). A section of the existing informal car park would also be

upgraded, including sealing the car park surface and landscaping

- Treated water would flow back to existing watercourses via new, upgraded and existing infrastructure
- Ancillary infrastructure and operational facilities for electronic tolling and traffic control and signage (including electronic signage)
- Emergency access and evacuation facilities, including pedestrian and vehicular cross and long passages and fire and life safety systems
- Utility works, including protection and/or adjustment of existing utilities, removal of redundant utilities and installation of new utilities. A Utilities Management Strategy has been prepared for the project that identifies management options for utilities, including relocation or adjustment. Refer to **Appendix F** (Utilities Management Strategy) of the EIS.

The project does not include:

- Site management works at the Rozelle Rail Yards. These works were separately assessed and determined by Roads and Maritime through a Review of Environmental Factors under Part 5 of the EP&A Act (refer to **Chapter 2** (Assessment process) of the EIS)
- Ongoing motorway maintenance activities during operation
- Operation of the components of the Rozelle interchange which are the tunnels, ramps and associated infrastructure being constructed to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project.

Temporary construction ancillary facilities and temporary works to facilitate the construction of the project would also be required.

2.2.1 Staged construction and opening of the project

It is anticipated the project would be constructed and opened to traffic in two stages (as shown in **Figure 2-1**).

Stage 1 would include:

- Construction of the mainline tunnels between the M4 East at Haberfield and the New M5 at St Peters, stub tunnels to the Rozelle interchange (at the Inner West subsurface interchange) and ancillary infrastructure at the Darley Road motorway operations complex (MOC1) and Campbell Road motorway operations complex (MOC5)
- These works are anticipated to commence in 2018 with the mainline tunnels open to traffic in 2022. At the completion of Stage 1, the mainline tunnels would operate with two traffic lanes in each direction. This would increase to generally four lanes at the completion of Stage 2, when the full project is operational.

Stage 2 would include:

- Construction of the Rozelle interchange and Iron Cove Link including:
  - Connections to the stub tunnels at the Inner West subsurface interchange (built during Stage 1)
  - Ancillary infrastructure at the Rozelle West motorway operations complex (MOC2), Rozelle East motorway operations complex (MOC3) and Iron Cove Link motorway operations complex (MOC4)
  - Connections to the surface road network at Lilyfield and Rozelle
  - Construction of tunnels, ramps and associated infrastructure as part of the Rozelle interchange to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project
- Stage 2 works are expected to commence in 2019 with these components of the project open to traffic in 2023.

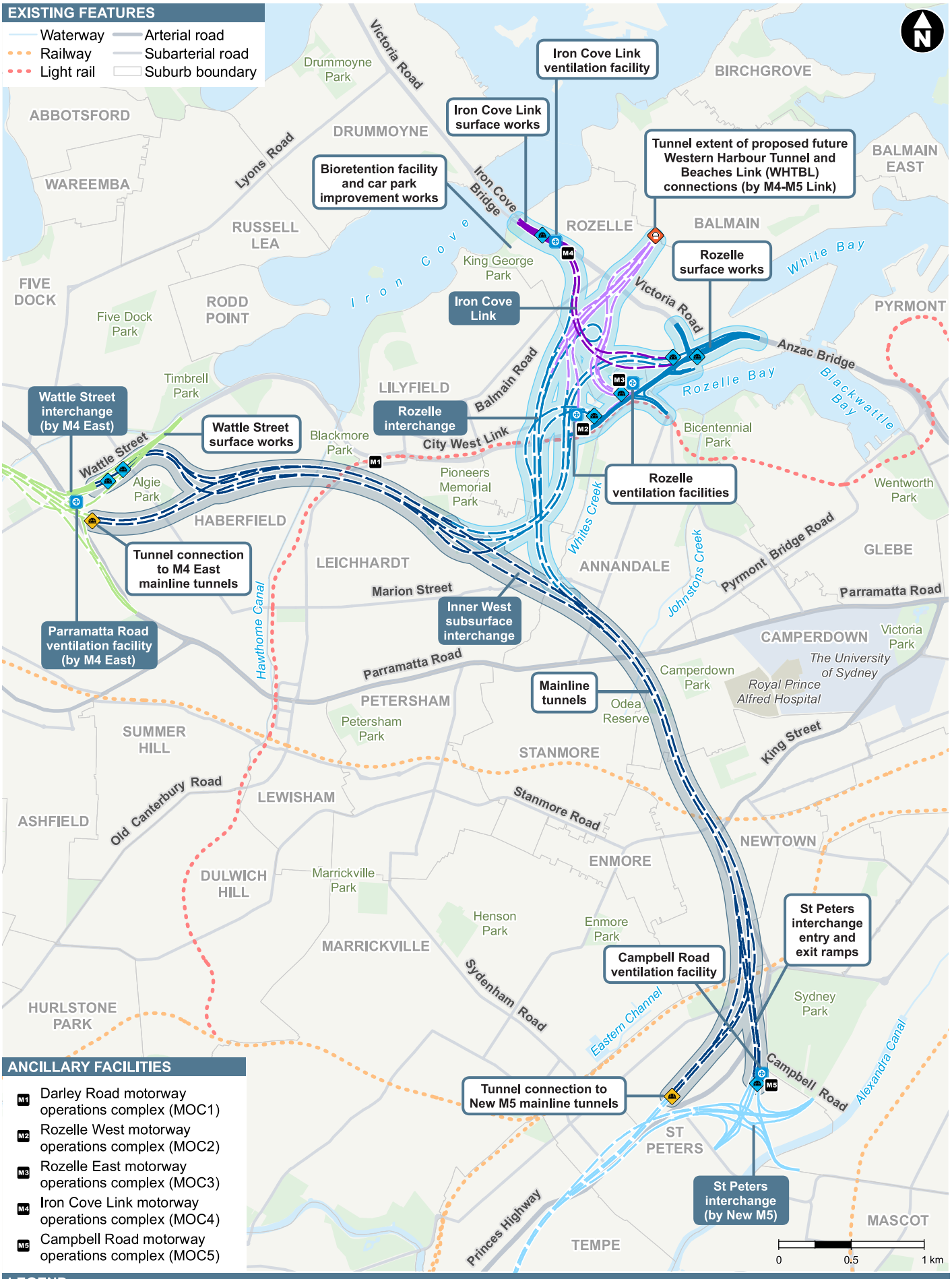

Figure 2-1 Overview of the project

2.3 Construction activities

An overview of the key construction features of the project is shown in **Figure 2-2** and would generally include:

- Enabling and temporary works, including provision of construction power and water supply, ancillary site establishment including establishment of acoustic sheds and construction hoarding, demolition works, property adjustments and public and active transport modifications (if required)
- Construction of the road tunnels, interchanges, intersections and roadside infrastructure
- Haulage of spoil generated during tunnelling and excavation activities
- Fitout of the road tunnels and support infrastructure, including ventilation and emergency response systems
- Construction and fitout of the motorway operations complexes and other ancillary operations buildings
- Realignment, modification or replacement of surface roads, bridges and underpasses
- Implementation of environmental management and pollution control facilities for the project.

A more detailed overview of construction activities is provided in **Table 2-1**.

Table 2-1 Overview of construction activities

Component	Typical activities
Site establishment and enabling works	· Vegetation clearing and removal · Utility works · Traffic management measures · Install safety and environmental controls · Install site fencing and hoarding · Establish temporary noise attenuation measures · Demolish buildings and structures · Carry out site clearing · Heritage salvage or conservation works (if required) · Establish construction ancillary facilities and access · Establish acoustic sheds · Supply utilities (including construction power) to construction facilities · Establish temporary pedestrian and cyclist diversions
Tunnelling	· Construct temporary access tunnels · Excavation of mainline tunnels, entry and exit ramps and associated tunnelled infrastructure and install ground support · Spoil management and haulage · Finishing works in tunnel and provision of permanent tunnel services · Test plant and equipment
Surface earthworks and structures	· Vegetation clearing and removal · Topsoil stripping · Excavate new cut and fill areas · Construct dive and cut-and-cover tunnel structures · Install stabilisation and excavation support (retention systems) such as sheet pile walls, diaphragm walls and secant pile walls (where required) · Construct required retaining structures · Excavate new road levels
Bridge works	· Construct piers and abutments · Construct headstock · Construct bridge deck, slabs and girders · Demolish and remove redundant bridges
Drainage	· Construct new pits and pipes · Construct new groundwater drainage system

Component	Typical activities
	· Connect drainage to existing network · Construct sumps in tunnels as required · Construct water quality basins, constructed wetland and bioretention facility and basin · Construct drainage channels · Construct spill containment basin · Construct onsite detention tanks · Adjustments to existing drainage infrastructure where impacted · Carry out widening and naturalisation of a section of Whites Creek · Demolish and remove redundant drainage
Pavement	· Lay select layers and base · Lay road pavement surfacing · Construct pavement drainage
Operational ancillary facilities	· Install ventilation systems and facilities · Construct water treatment facilities · Construct fire pump rooms and install water tanks · Test and commission plant and equipment · Construct electrical substations to supply permanent power to the project
Finishing works	· Line mark to new road surfaces · Erect directional and other signage and other roadside furniture such as street lighting · Erect toll gantries and other control systems · Construct pedestrian and cycle paths · Carry out earthworks at disturbed areas to establish the finished landform · Carry out landscaping · Closure and backfill of temporary access tunnels (except where these are to be used for inspection and/or maintenance purposes) · Site demobilisation and preparation of the site for a future use

Twelve construction ancillary facilities are described in this EIS (as listed below). To assist in informing the development of a construction methodology that would manage constructability constraints and the need for construction to occur in a safe and efficient manner, while minimising impacts on local communities, the environment, and users of the surrounding road and other transport networks, two possible combinations of construction ancillary facilities at Haberfield and Ashfield have been assessed in this EIS. The construction ancillary facilities that comprise these options have been grouped together in this EIS and are denoted by the suffix a (for Option A) or b (for Option B).

The construction ancillary facilities required to support construction of the project include:

- Construction ancillary facilities at Haberfield (Option A), comprising:
  - Wattle Street civil and tunnel site (C1a)
  - Haberfield civil and tunnel site (C2a)
  - Northcote Street civil site (C3a)
- Construction ancillary facilities at Ashfield and Haberfield (Option B), comprising:
  - Parramatta Road West civil and tunnel site (C1b)
  - Haberfield civil site (C2b)
  - Parramatta Road East civil site (C3b)
- Darley Road civil and tunnel site (C4)
- Rozelle civil and tunnel site (C5)

- The Crescent civil site (C6)
- Victoria Road civil site (C7)
- Iron Cove Link civil site (C8)
- Pyrmont Bridge Road tunnel site (C9)
- Campbell Road civil and tunnel site (C10).

The number, location and layout of construction ancillary facilities would be finalised as part of detailed construction planning during detailed design and would meet the environmental performance outcomes stated in the EIS and the Submissions and Preferred Infrastructure Report and satisfy criteria identified in any relevant conditions of approval.

The construction ancillary facilities would be used for a mix of civil surface works, tunnelling support, construction workforce parking and administrative purposes. Wherever possible, construction sites would be co-located with the project footprint to minimise property acquisition and temporary disruption. The layout and access arrangements for the construction ancillary facilities are based on the concept design only and would be confirmed and refined in response to submissions received during the exhibition of this EIS and during detailed design.

2.3.1 Construction program

The total period of construction works for the project is expected to be around five years, with commissioning occurring concurrently with the final stages of construction. An indicative construction program is shown in **Table 2-2**.

Table 2-2 Indicative construction program

Construction activity	Indicative construction timeframe																							
	2018				2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mainline tunnels																								
Site establishment and establishment of construction ancillary facilities			■	■	■	■	■	■	■	■														
Utility treatments and connections			■	■	■	■	■	■																
Tunnel construction				■	■	■	■	■	■	■	■	■	■											
Portal construction				■	■	■	■	■																
Construction of permanent operational facilities												■	■	■	■	■								
Mechanical and electrical fitout works														■	■	■								
Establishment of tolling facilities															■	■								
Site rehabilitation and landscaping																■	■	■	■					
Surface road works																	■	■	■					
Demobilisation and rehabilitation																			■	■				
Testing and commissioning																■	■	■	■	■				
Rozelle interchange and Iron Cove Link																								
Site establishment and establishment of construction ancillary facilities				■	■	■	■	■																

Construction activity	Indicative construction timeframe																							
	2018				2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Utility treatments and connections and site remediation																								
Tunnel construction																								
Portal construction																								
Construction of surface road works																								
Construction of permanent operational facilities																								
Mechanical and electrical fitout works																								
Establishment of tolling facilities																								
Site rehabilitation and landscaping																								
Demobilisation and rehabilitation																								
Testing and commissioning																								

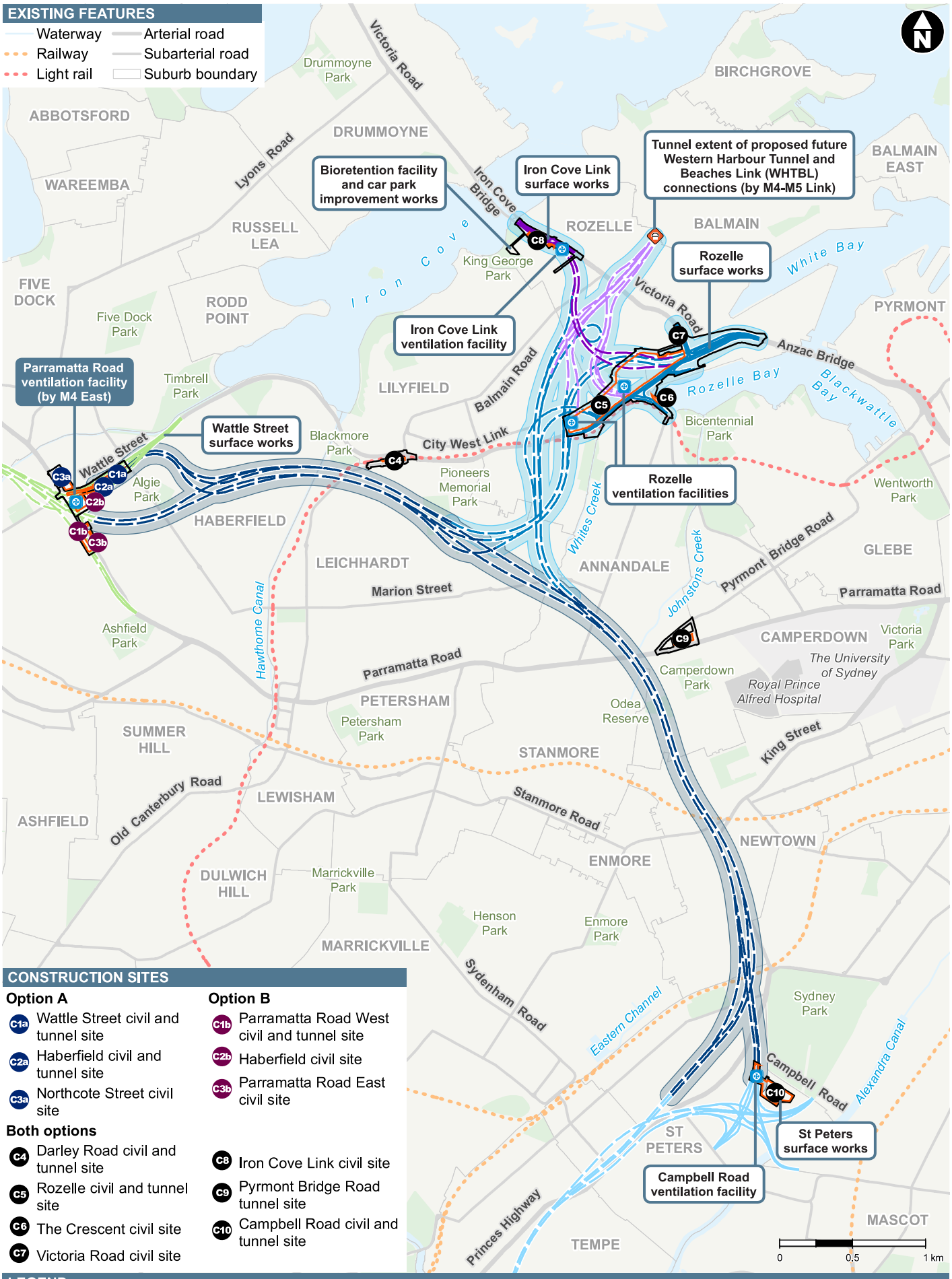

Figure 2-2 Overview of project footprint and ancillary facilities

3 Assessment methodology

3.1 Methodology overview

This SEIA methodology has been developed according to the SEARs and the Roads and Maritime Socio-economic Assessment Guideline EOA-N05 (Roads and Maritime 2013).

The SEIA is informed by the outcomes of the various technical working papers that have been prepared for the project. This includes the air quality, urban design, traffic and transport, noise and vibration, landscape and visual impacts, non-Aboriginal and Aboriginal heritage, arboricultural impacts and human health technical working papers. In consideration of the results of the technical working papers and the outcomes of consultation, a comprehensive assessment of construction and operational socio-economic impacts has been prepared in accordance with the Roads and Maritime guideline.

In preparing the SEIA, the following process was implemented:

1. Review of assessments undertaken for previous stages of the WestConnex program of works to scope issues and identify the potential scale and magnitude of impacts
2. Definition of the study area and precincts (see **Figure 3-1**)
3. Development of a profile of existing geographic areas, social infrastructure and businesses that may be influenced by the project (using Australian Bureau of Statistics (ABS) Census 2011 and Transport Performance and Analytics (TPA))
4. Consultation with communities, businesses and stakeholders within the study area and surrounds to determine community, stakeholder and business values and concerns. Review of council community strategic plans to further inform the types of values held by the communities
5. Review of issues and comments raised through the consultation and communication activities undertaken for the project
6. Identification of likely changes/impacts that may occur as a result of the project, including specific effects on stakeholders, general community, businesses, social infrastructure and other receivers
7. Assessment of the significance of social, economic and business impacts during construction and operation
8. Assessment of the cumulative social, economic and business impacts
9. Identified mitigation, plans and strategies for monitoring and managing the impacts during both construction and operation.

3.2 Defining the study area

ABS geographic boundaries (referred to as Statistical Area Level 2 (SA2)) were used to define the socio-economic study area (see **Figure 3-1**). The SA2's that either overlapped with or were in close proximity to the project footprint defined the study area. The study area extends across three precincts, each of which is described in further detail in **Chapter 5**. Although a study area has been defined, it is acknowledged that the spatial extent of potential effects would vary and would not be limited to the study area. For this reason, the impact assessment does consider changes to the socio-economic environment both within the study area and further afield.

When considering direct construction and operational effects, the scoping of issues determined that social infrastructure or businesses that were within close proximity to the construction sites or portals were more likely to be exposed to potential impacts. In most instances, direct effects were generally confined to within a 400 metre radius of the site. The existing environment section of the report identifies the businesses and social infrastructure located within this 400 metre parameter.

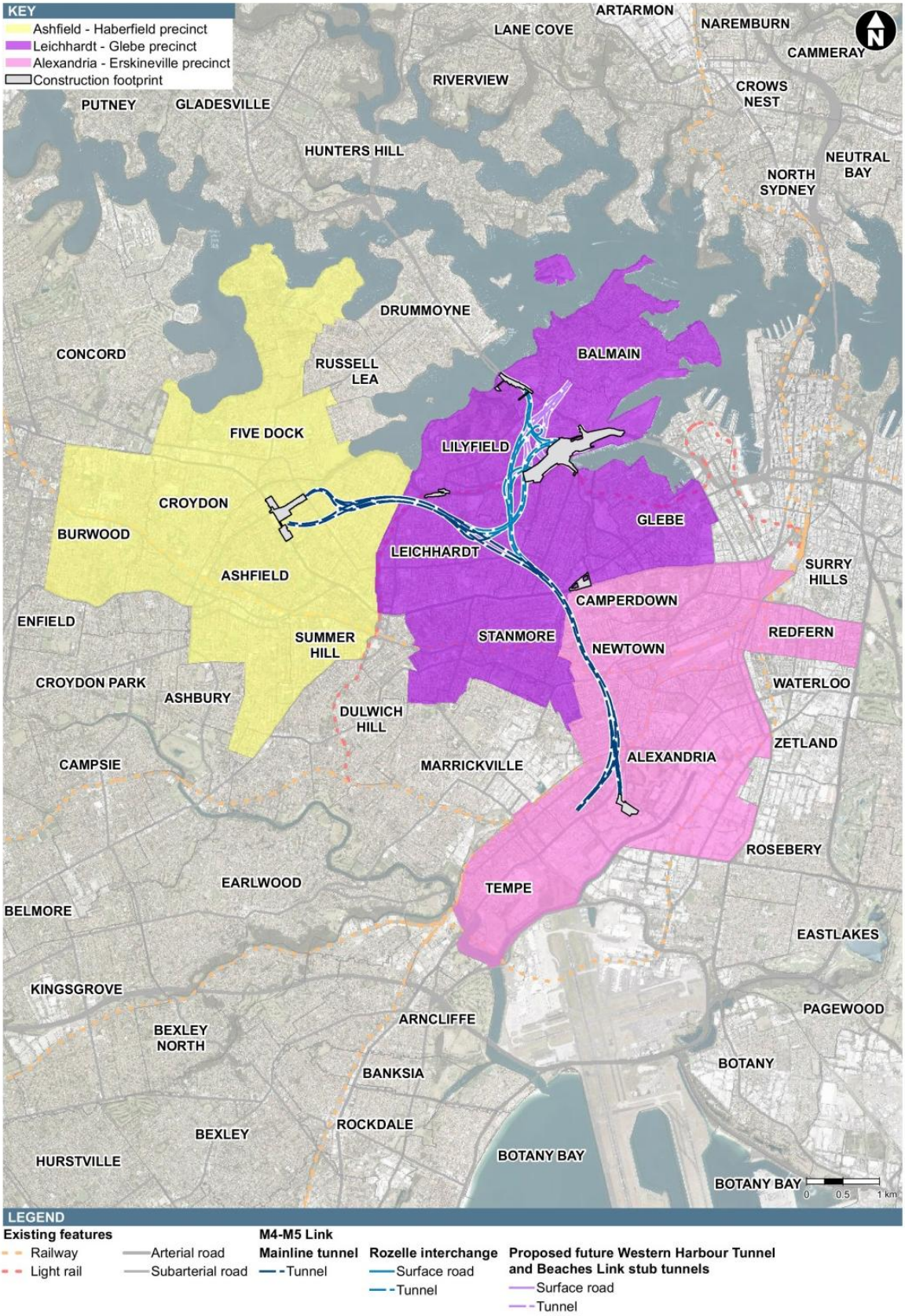

Figure 3-1 Study area

3.3 Data sources used to inform the study

In preparing this report, HillPDA has relied primarily upon the project information provided by AECOM. Additional data in this report has been derived from:

- ABS (Census 2011)[1]
- ABS (8165.0 Counts of Australian Businesses 2016)
- ABS (5220.0 Australian National Accounts 2016)
- NSW Department of Planning and Environment Population and Dwelling Forecasts 2017
- Transport Performance and Analytics, 2017
- Relevant State, local government and agency policies and guidelines (**Chapter 4**)
- Outcomes of community, business and stakeholder consultation (**section 6.1**)
- Geographic information system (GIS) information on land uses as informed by relevant Local Environmental Plans.

3.4 Business survey approach

A business impact survey was used 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 within 400 metres of the proposed construction compounds at Rozelle, Annandale and Lilyfield. The survey was conducted over a two-week period in November 2016. Businesses were approached at random with around 100 businesses participating in the survey.

The business impact survey was undertaken across a wide variety and representative sample of business types including businesses such as retail shops, real estate agencies, cafes, pubs, restaurants, auto service centres and professional service businesses.

The survey did not involve businesses located on properties that would be directly acquired on behalf of the project[2]. Businesses around the construction sites at Haberfield and St Peters were not included within the survey as perceptions and concerns were collected during the M4 East and New M5 projects. Despite this, the business impacts that were previously identified at and around these locations were considered in the overall assessment of impacts for the M4-M5 Link project. This included the consideration of the cumulative impact of extended construction periods.

All information gathered as part of the business surveys was collated into a database. Findings from this survey have been analysed and summarised in **Table 6-1**. The survey report is provided as **Annexure A** to this assessment.

3.5 Stakeholder and community consultation approach

Stakeholder and community consultation has been undertaken for the project. Outcomes from consultation (see **Chapter 6**) have underpinned the SEIA. This assessment has analysed the findings from:

- Comments provided through the project information phone line and project email address
- Information provided through the online interactive mapping tool established to encourage the community to provide location-specific ideas and feedback
- Five community idea sessions, held between August and September 2016, which provided an opportunity for the local community to express their ideas and feedback on the concept design and construction of the project

[1] 2016 Census data was not available at the time of writing of this SEIA.

[2] Although not participants in the survey, businesses located on properties that are proposed to be acquired are still considered during the assessment in section 7.

- Various one-on-one meetings with community members and residents between late 2016 and mid-2017 to provide specific feedback and raise concerns
- Five community information sessions held between May and June 2017 to provide the community an update on the M4-M5 Link concept design and to provide further opportunities for the local community to express feedback and raise key issues.

3.6 Impact assessment framework

The impact assessment presented in this report identifies and evaluates changes to existing socio-economic conditions arising from the construction and/or operation of the project. This includes the assessment of direct and indirect impacts and benefits, as well as consideration of cumulative impacts.

The following impact assessment considers:

- Property impacts, including the socio-economic consequences of both direct and indirect impacts associated with property acquisition and potential changes to property access, values, amenity, power and utility changes and plans for residual land use
- Social impacts arising from construction and operation relating to population and demography, amenity, community health, community values, social infrastructure, local access and connectivity, heritage, and visual character
- Business impacts and benefits relating to passing trade, vehicle parking, servicing and deliveries, employment and recruitment, business access and connectivity, and business amenity
- Economic impacts to local and regional industries associated with construction expenditure and employment, economic value add, freight and efficiency costs, and road tolling.

These issues have been assessed in **Chapter 7** and **Chapter 8.**

Figure 3-2 outlines the assessment framework that was employed to determine the overall significance of socio-economic impacts. The following sections outline the criteria that underpin each of the components of the assessment framework. Project data and knowledge and professional judgement has been applied on a case-by-case basis to identify the duration, spatial extent, severity, consequence, likelihood and ultimately the significance of impact on the socio-economic environment for each identified impact.

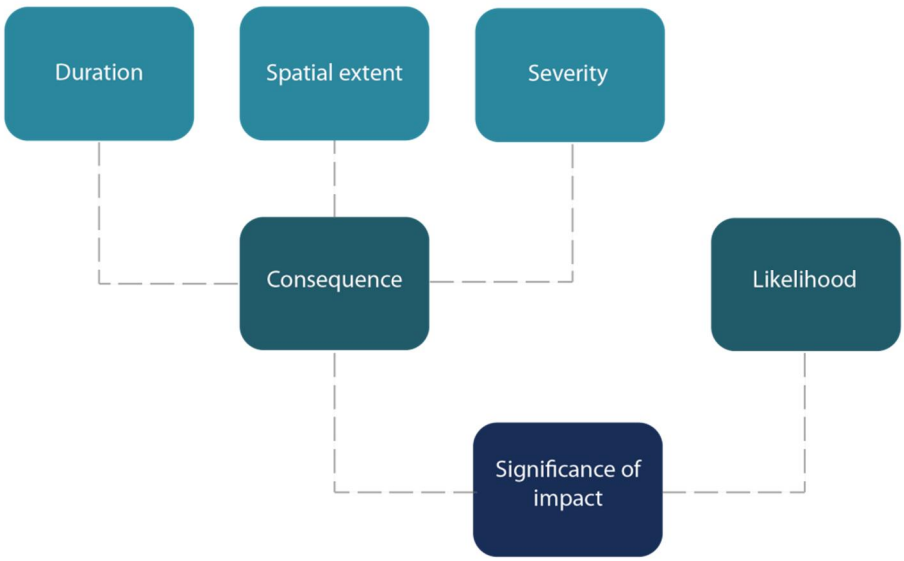

Figure 3-2 Socio-economic assessment framework

3.6.1 Consequence

Consequence refers to the degree of benefit or detriment associated with the impact. Duration, spatial extent and severity of change (**Table 3-1**, **Table 3-2**, **Table 3-3** respectively) are the underlying criteria that contribute to the determination of the overall consequence level. The definition of the various levels of consequence is included in **Table 3-4**.

Duration

Table 3-1 categorises the potential duration that an impact or impacts may affect a household, business or community.

Table 3-1 Duration of impact

Category	Description
Short term	Less than six months
Short-medium term	Between six months and two years
Medium term	Between two and five years
Medium-long term	Between five and ten years
Long term	More than ten years (effect likely to be irreversible)

Spatial extent

Table 3-2 categorises the geographic extent of an impact with consideration of the number of people within the geographic extents.

Table 3-2 Spatial extent of impact

Spatial extent	Description
Locality	Street, multiple streets or neighbourhood level
Suburb	Suburb as defined by ABS
LGA	Inner West LGA and City of Sydney LGA
Region	Greater Sydney

Severity of impact

Table 3-3 defines the severity of impact based on the intensity of potential effect and the potential change to the existing socio-economic environment (baseline condition). Severity effects could be acute or chronic.

Table 3-3 Severity of change

Severity	Description
Neutral	No discernible change to baseline condition
Small	Small change to baseline condition
Medium	Medium change to baseline condition
Large	Large changes to baseline condition

Level of consequence

Table 3-4 identifies the consequence of the impact, based on the extent, duration and severity of the impact.

Table 3-4 Consequence of impact

Category	
Negligible	No discernible positive or negative changes to baseline condition.
Slight	Small change to baseline condition, generally short or short-medium term, confined to a locality or suburb and are able to be mitigated or enhanced.
Moderate	Medium change to baseline condition that may be short, medium, or long term. The spatial extent may vary; however impacts would usually respond to mitigation or enhancement.
Major	Large change to baseline condition usually resulting in medium to long-term effects. Spatial extent is generally at an LGA or regional level with the potential for substantial effects on the social or economic environment. Negative impacts would require extensive mitigation.

3.6.2 Likelihood

Table 3-5 categorises the likelihood criteria used for the assessment.

Table 3-5 Likelihood of impact

Likelihood	Description	Probability
Near certain	Expected to occur, almost frequently	~ 90 per cent
High	Could occur in many instances	~ 70 per cent
Possible	Just as likely to happen as not	~ 50 per cent
Low	Very limited occurrence	~ 30 per cent
Rare	Occurrence in exceptional circumstances	~ 10 per cent

3.6.3 Significance of impact

The significance of the impact is determined with consideration of the:

- Consequence of the impact, based on the extent, duration and severity of the impact.
- Likelihood of the impact occurring

The nature of the impacts may be:

- Positive – the impact benefits the socio-economic environment or community values
- Negative – the impact adversely effects the socio-economic environment or community values
- Neutral – the impact is neither positive or negative.

The following assessment matrix (**Table 3-6**) determines the significance of the impact on the socio-economic environment.

Table 3-6 Significance of socio-economic effect

		Consequence			
		Neutral	**Slight**	**Moderate**	**Major**
Likelihood	**Rare**	Negligible	Negligible	Minor	Moderate
	Low	Negligible	Negligible	Minor	Moderate
	Possible	Negligible	Minor	Moderate	Moderate
	High likelihood	Minor	Minor	Moderate	Major
	Near certain	Minor	Moderate	Major	Major

4 Socio-economic policy framework

This section provides an overview of strategic and policy documents relevant to the SEIA. This includes planning guidelines and policies from various local and state government agencies.

4.1 Assessment guidelines

4.1.1 Environmental Impact Assessment Practice Note – Socio-economic assessment (EIA-N05)

Roads and Maritime Practice Note EIA-N05 applies when assessing the socio-economic impacts of medium to large road projects. The practice note provides guidance on the steps to be undertaken when completing a SEIA, including the relevant reporting requirements. This includes identification of the level of assessment appropriate for a particular project.

For a project at the scale of the project, the practice note requires a comprehensive assessment. **Table 4-1** outlines the rationale for the level of assessment (scale and magnitude of impact) and the expectations around a comprehensive SEIA.

Table 4-1 Triggers to undertake a comprehensive level of SEIA

Scale of impacts	Magnitude of impacts	Information expectations	Socio-economic baseline content
· Many impacts; or · Impacts affecting a broad section of the community; or · Impacts likely to cause broad community concern.	· Impacts of a major nature · Impacts of long duration · Impacts that require specific mitigation measures · Impacts that may have residual affect after mitigation	· Desktop research · Quantitative information from secondary sources · Extensive primary research required · Community and stakeholder consultation to define community values, impacts and mitigation measures.	· ABS Census data, fully describing population and demographic characteristics · Community structure and patterns · Community values · Economic environment · Outcomes of consultation with community and government.

Source: Roads and Maritime Services, 2012 'Environmental Impact Assessment Practice Note: Socio-economic assessment – EIA-N05 – Table 1', Transport for NSW

The practice note further outlines the requirements for establishing the socio-economic baseline. A comprehensive assessment is required to consider the full range of qualitative and quantitative aspects of a socio-economic profile.

In addition, the practice note provides a range of matters to be considered in assessing the socio-economic benefits and impacts of a road project. These include issues such as property impacts, changes to population and demography, business and industry, social infrastructure, community values, local amenity, and access and connectivity. In scoping impacts, the practice note states that consideration should be given as to whether:

- Changes would be negative or positive
- Quality of life, community identity, safety, health or economic viability would be affected
- Impacts would be acceptable or tolerated by most people, that is, would not cause concern or discomfort
- The area affected is limited to people for whom individual arrangements can be made, or extends to an area which requires more detailed strategies to be implemented

- Impacts would affect social equity, such as access to housing, employment, services or customers
- Negative impacts would be temporary or permanent
- The impacts would compromise wider planning goals or community values.

This SEIA has been prepared in accordance with the practice note. Specific socio-economic issues raised by the practice note have been separately assessed within **Chapter 7** and **Chapter 8.** The above points have been integrated into the SEIA methodology as outlined in **Chapter 3**.

4.2 Australian Government

4.2.1 Infrastructure Australia

At the Australian Government level, the Australian Infrastructure Audit 2015 projected that, in the absence of interventions to address the problem, the cost of congestion in the Sydney/Wollongong/Newcastle area would more than double from $5.6 billion in 2011 to $14.8 billion in 2031.

In light of the above, both the NSW and Australian Governments have undertaken comprehensive planning and investigations to inform their investment in WestConnex. The NSW Government released an updated Strategic Business Case for WestConnex in November 2015 for consideration and approval by Infrastructure Australia. In April 2016, Infrastructure Australia rated WestConnex a High Priority Project[3]. In the Project Business Case presented to the Australian Infrastructure Board for evaluation, was confident that the benefits of WestConnex, as a whole would exceed the costs of the project.

To date the Australian Government has provided:

- A $1.5 billion grant for Stage 1 of WestConnex (comprising the M4 Widening and M4 East projects)
- A $2 billion loan for Stage 2 of WestConnex (to accelerate delivery of the New M5 project).

Infrastructure Australia has highlighted that WestConnex would increase capacity of the Sydney road network, extend the motorway network and directly connect the M4 and M5 motorways, as well as improving connectivity to Sydney Airport and Port Botany through the St Peters interchange.

4.3 NSW Government

4.3.1 NSW Premier's Priorities

In 2015, the NSW Premier announced a new set of 'State Priorities' in support of the NSW Government's aim deliver projects that create a stronger, healthier and safer NSW. These priorities included several with direct relevance to the socio-economic status of the State[4]:

- Creating jobs
- Building infrastructure
- Encouraging business investment
- Boosting apprenticeships
- Improving road travel reliability
- Increasing housing supply

[3] High Priority Projects are potential infrastructure solutions for which a full business case has been completed and been positively assessed by the Infrastructure Australia Board. A High Priority Project addresses a major problem or opportunity of national significance

[4] NSW Government 2015, State Priorities, view at: www.nsw.gov.au/premiers-priorities on 10th October 2016.

- Ensuring on time running of public transport.

The project directly addresses a number of these priorities through the creation of jobs, building of infrastructure and enhancement of road travel reliability. The operation of the project would also improve business connectivity, enhancing freight and commercial movement networks, making it easier for businesses to operate in Sydney.

4.3.2 Infrastructure NSW

WestConnex was the major priority project highlighted in Infrastructure NSW's 2012 *State Infrastructure Strategy*[5] because:

- Investment in Sydney's road networks was viewed as being best able to service diverse trips
- Demands on the M4 and M5 corridors were leading to high levels of congestion and low speeds
- The M4 and M5 corridors are important road routes for freight, business transports and for the connection to the 'gateways' at Port Botany and Sydney Airport.

WestConnex also aligns with NSW Government priorities identified in the State Plan – *NSW 2021, A Plan to Make NSW Number One*[6], including increasing the competitiveness of doing business in Australia (Goal 4), reducing travel times (Goal 7) and improving road safety.

4.3.3 NSW Long Term Transport Master Plan

The *NSW Long Term Transport Master Plan*[7] was released in 2012 and sets out funding priorities over the next 20 years which would deliver public transport, roads and freight network links across the State.

Specifically, the Plan endorses WestConnex as completing the missing motorway links in Sydney and is identified as an immediate priority. The construction of WestConnex would:

- Support Sydney's long-term economic growth through improved motorway access and connections linking Sydney's international gateways and Western Sydney and places of business across the city
- Relieve road congestion so as to improve the speed, reliability and safety of travel in the M4 and M5 corridors, including parallel arterial roads
- Cater for the diverse travel demands along these corridors that are best met by road infrastructure
- Create opportunities for urban renewal, improved liveability, public and active transport improvements along and around Parramatta Road
- Enhance the productivity of commercial and freight generating land uses strategically located near transport infrastructure
- Optimise user pays contributions to support funding in a way that is affordable and equitable
- Improve economic productivity through reduced freight operating costs and increased freight productivity
- Have the potential to deliver travel time savings in the order of 15 minutes to 35 minutes by 2021 on the M4 and M5 corridors
- Improve urban amenity.

The Plan provides a strategic evidence base for the project, detailing the need to remove freight and heavy vehicles off surface roads to relieve congestion, improve business amenity and support

[5] Infrastructure NSW 2012, *State Infrastructure Strategy 2012 – 2023*, NSW Government

[6] Department of Premier and Cabinet 2011, *NSW 2021 A Plan to Make NSW Number One*, NSW Government

[7] Transport for NSW 2012, *NSW Long Term Transport Master Plan*, NSW Government

productivity and cost efficiency. These economic improvements would have a clear regional benefit and would be expected to filter down to local businesses and economies.

4.3.4 NSW Freight and Ports Strategy

The *NSW Freight and Ports Strategy*[8], released in November 2013, provides actions and goals that plan for the growth of the State's economy over the next 20 years. The Strategy focuses on strategic policy, infrastructure and land use planning initiatives to deliver an efficient freight network in NSW to support economic growth and employment. This includes the NSW Government's priority to manage congestion by encouraging a shift in freight movements to rail, particularly in the context of an expected increase in container movements from Port Botany.

In relation to WestConnex project the Strategy identifies that the:

> *'WestConnex project will reduce freight costs through increased travel speeds and reliability and reduce the distances travelled by freight vehicles. The WestConnex has the potential to deliver time savings on the M4/M5 corridors in the order of 15 minutes to 35 minutes by 2021'*[9]*.*

4.3.5 A Plan for Growing Sydney

NSW Department of Planning and Environment (DP&E) published *A Plan for Growing Sydney*[10] in December 2014. This document provides a framework for strengthening the global competitiveness of the city. To achieve this, the government aims for Sydney to be:

- A competitive economy with world-class services and transport
- A city of housing choice with homes that meet our needs and lifestyles
- A great place to live with communities that are strong, healthy and well connected
- A sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources[11].

By 2031, Sydney's economic output would almost double to $565 billion a year, with this growth being fuelled partly by an additional 689,000 new jobs over the period. Sydney would also experience a population growth of about 1.6 million people. To meet this population growth, an additional 664,000 new dwellings would need to be constructed.

Relevant to this study is Direction 1.5 of the Plan, which aims to enhance the capacity of Sydney's gateways and freight networks. The project has the potential to improve business productivity on a macro and micro-economic scale through increased transport efficiency and job creation during construction and upon operation. This includes both direct job growth arising from construction-related activities as well as indirect job growth from secondary construction and operational service demand (eg consultants). The transport efficiencies the project creates for commercial and freight movement would also enhance the capacity of freight networks and connections to the regions, producing a greater economic benefit to businesses and the state economy.

4.3.6 Draft Central District Plan

The Greater Sydney Commission (GSC) is tasked with coordinating and aligning the planning that would shape the future of Greater Sydney, taking a collaborative, 'one government' approach to lead and guide the planning for development, transport and housing. This includes the preparation of District Plans supporting the actions and outcomes of *A Plan for Growing Sydney* while also identifying an emerging new vision for Greater Sydney's future.

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[8] Transport for NSW 2013, *NSW Freight and Ports Strategy*, NSW Government

[9] Transport for NSW 2013, *NSW Freight and Ports Strategy*, NSW Government, page 104.

[10] NSW Department of Planning and Environment 2014, *A Plan For Growing Sydney*, NSW Government.

[11] NSW Department of Planning and Environment 2014, *A Plan For Growing Sydney*, NSW Government.

In November 2016, the GSC released the six draft District Plans for Sydney, which were placed on public exhibition until the end of March 2017. The project is predominantly located within the Central District, which covers the LGAs of Bayside, Burwood, Canada Bay, Inner West, Randwick, Strathfield, the City of Sydney, Waverley and Woollahra.

The snapshot of the Central District identifies that there would be an estimated 16,250 more people moving into the District every year, with over half the population likely to live in apartments. Key growth age groups would include 5–19 years, 65–84 years and 85+ years. This suggests that there would be a higher percentage of dependent people living in the District in the future.

The draft Central District Plan identifies that the district is currently experiencing significant transformation as a result of major urban renewal projects, major transport infrastructure projects (including WestConnex), investment in major arts and cultural facilities, ongoing investment in education and health, and investment in business, entertainment and recreational attractions[12]. This transformation is suggested to benefit businesses from enhanced local and global connections and highlights the extent of change already occurring across the study area.

One of the core objectives of the draft Plan is for the Central District to be a global sustainability leader, enhancing the District's liveability, productivity and attractiveness for residents and visitors. Committed and planned infrastructure projects are expected to support the efficient movement of goods and services into and across the District in the future.

The Plan identifies specific economic opportunities that would influence the socio-economic environment of the project. These include supporting the transport gateways of Sydney Airport and Port Botany; seeing the project as a strategic transport route for business, employment and urban services; leveraging the economic opportunity of Parramatta Road, and planning for a Central District that is highly productive and well-connected. Improving the efficiency of the freight network and supporting the '30-minute access to jobs and services' initiative are seen as key strategic priorities relevant to the project.

Knowledge intensive jobs relating to major hospitals, tertiary education and the innovative and creative industries are suggested to see a high level of growth. The presence of existing or proposed major transport gateways are defined as being the critical link in supporting these strategic employment growth areas and the Sydney CBD. The delivery of the project is central to the delivery of these objectives.

4.3.7 Parramatta Road Corridor Urban Transformation Strategy

The NSW Government released the *Parramatta Road Corridor Urban Transformation Strategy* developed by UrbanGrowth NSW, in partnership with local government, in November 2016[13]. The Strategy and supporting Implementation Tool Kit (Program), is the NSW Government's 30-year plan for how the Corridor would grow and develop. The Program is enabled by the removal of significant volumes of traffic from Parramatta Road arising from the construction the M4 East and the M4-M5 Link project. This reduction in traffic has the potential to provide an improved environment for living and working within the Parramatta Road corridor, stimulating housing and employment growth and generating additional economic activity.

4.3.8 Transformation Plan: The Bays Precinct, Sydney

The *Transformation Plan: The Bays Precinct* was released by UrbanGrowth NSW in October 2015 to establish a strategy for how future development would progress within The Bays Precinct.

[12] Greater Sydney Commission 2016, *draft Central District Plan*, NSW Government.

[13] UrbanGrowth NSW 2016, *Parramatta Road Corridor Urban Transformation Strategy*, NSW Government.

The stated ambition of the Transformation Plan is to *'to drive an internationally competitive economy, through the creation of great destinations on Sydney Harbour that will transform Sydney*, *New South Wales and Australia'*[14]*.*

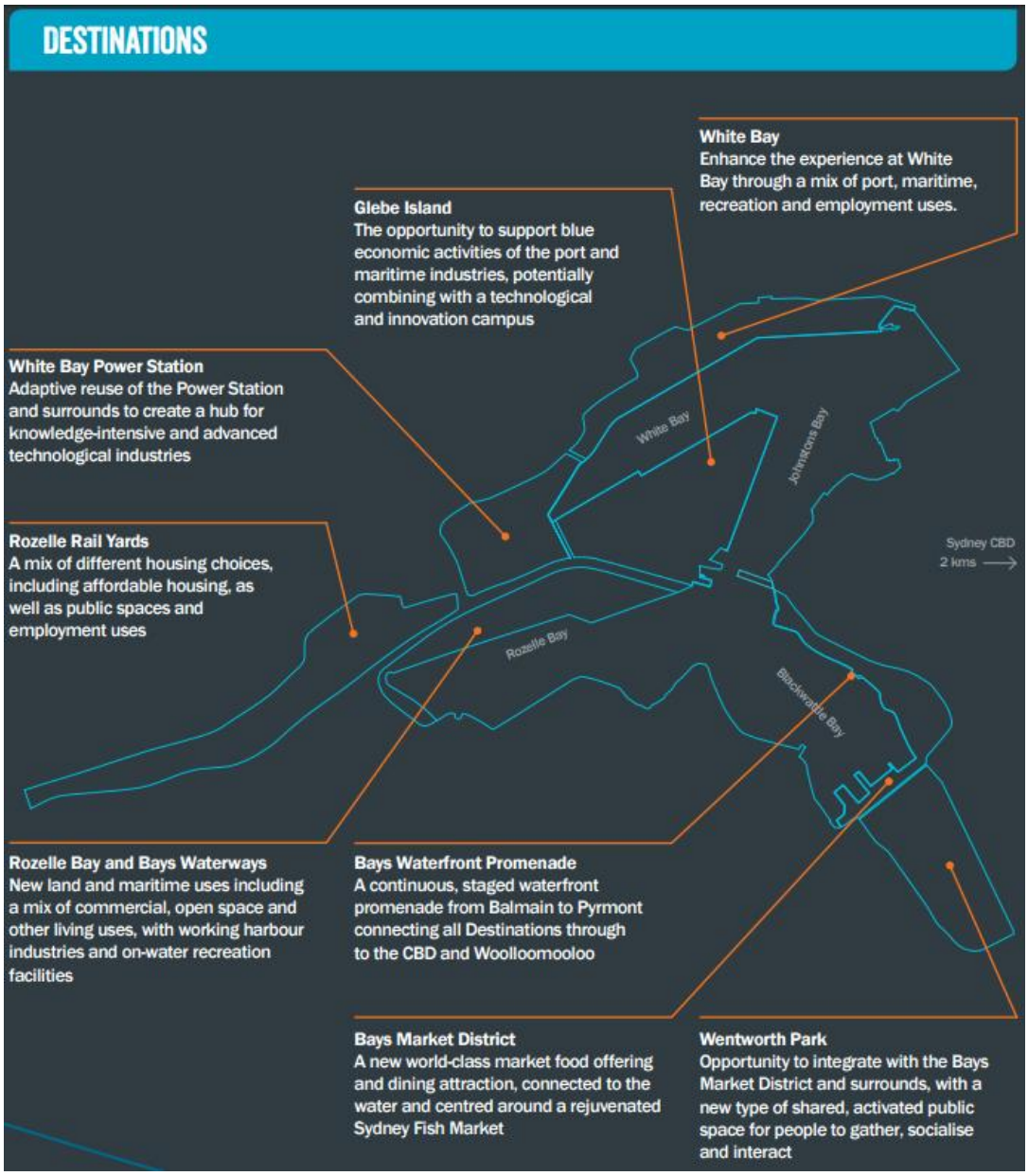


Figure 4-1 Extent of the Transformation Plan: The Bays Precinct, Sydney

Source: The Bays Precinct Transformation Plan 2015

Figure 4-1 identifies the eight sub-precincts to be the focus of the transformation, these include:

- White Bay: Enhance the experience at White Bay through a mix of port, maritime, recreation and employment uses
- Glebe Island: The opportunity to support blue economic activities of the port and maritime industries, potentially combining with a technological and innovation campus

[14] UrbanGrowth NSW 2015, *The Bays Precinct Transformation Plan, Sydney*, NSW Government.

- White Bay Power Station: Adaptive reuse of the Power Station and surrounds to create a hub for knowledge-intensive and advanced technological industries
- Rozelle Rail Yards: A mix of different housing choices, including affordable housing as well as public spaces and employment uses
- Rozelle Bay and Bays Waterways: New land and maritime uses including a mix of commercial, open space and other living uses, with working harbour industries and on-water recreation facilities
- Bays Waterfront Promenade: A continuous, staged waterfront promenade from Balmain to Pyrmont connecting all destinations through to the CBD and Woolloomooloo
- Bays Market District: A new world-class market food offering and dining attraction, connected to the water and centred around a rejuvenated Sydney Fish Market
- Wentworth Park: Opportunity to integrate with The Bays Market District and surrounds, with a new type of shared, activated public space for people to gather, socialise and interact[15].

The Bays Precinct Transformation Plan overlaps with areas relevant to the M4-M5 Link project. The Plan itself identifies that the Rozelle Rail Yards would sit next to major road infrastructure and that part of the area would be subject to development by WestConnex, as well as the CBD and South East Light Rail maintenance depot (currently under construction). Planning for WestConnex has considered the planned impact that the transformation of The Bays Precinct would have on the road network. This includes anticipated changes in the volume of vehicle trips to and from The Bays Precinct.

Since the release of the Transformation Plan in 2015, the (then) Premier in July 2016 announced key features of the Rozelle interchange, including up to 10 hectares of open space and an underground road link between Rozelle and Iron Cove Bridge.

Engagement with UrbanGrowth NSW, as an important project stakeholder, is ongoing due to the overlap of planning for the two projects and the Premier's announcement for the Rozelle interchange, which would influence the Transformation Plan for the Rozelle Rail Yards. The M4-M5 Link project design would provide valuable open space and active transport routes that would connect to The Bays Precinct.

It would be important to ensure that the Rozelle interchange is properly integrated into the future plans for The Bays Precinct and that consultation between the relevant agencies continue.

4.4 Local Government

4.4.1 Inner West Council

The Inner West Council was formed in 2016 by the merger of the former Ashfield, Leichhardt and Marrickville councils. The former Councils' strategic community plans are still applicable until a new Inner West community strategic plan is created.

Ashfield 2023 – Our Place, Our Future

The *Ashfield 2023 – Our Place, Our Future*[16] outlines the vision for the former Ashfield LGA, prepared in collaboration with the community. **Table 4-2** outlines the consultation results as described in the Strategy and the key service areas and goals.

[15] Ibid.

[16] Ashfield Council 2015, *Ashfield 2023 – Our Place, Our Future,* former Ashfield Council.

Table 4-2 Our Place, Our Future – Ashfield Community Strategic Plan – summary of community values and the community vision and strategic directions where relevant to the SEIA

Community values (informed by community engagement)
· Ashfield to become a location full of places and events that connect people of all ages and cultural backgrounds · Opportunities for lifelong learning · Our rich multicultural history protected and celebrated · A range of cultural facilities, opportunities for artistic expression, and an exciting range of events and entertainment opportunities · More facilities, green spaces and public places for community groups to meet and share culture · Assistance for vulnerable, disabled and isolated people · Local schools, preschools and centres of adult learning to be a key community focus with access to new technology · A caring and welcoming environment for new community members · Integration of public art to create a distinct sense of place.
Vision
In 2023, Ashfield is a place where everyone matters and community life is enriched by generations of migrants from many parts of the world. Ashfield is a place of unique, culturally enriched neighbourhoods, each with its own distinct character. The people of Ashfield are proud of their community. They think about the future with hope and want to improve the quality of life of present and future generations.
Seven key themes
· Creative and inclusive community · Safe, connected and accessible places · Attractive and lively town centre · Engaging and innovative local democracy · Thriving local economy · Unique and distinctive neighbourhoods.

Source: Ashfield Council 2014, Ashfield 2023 – Our Place, Our Future

The project would deliver outcomes that respond to a number of the key themes identified in this Plan, including the creation of safe, connected and accessible places and a thriving local economy. The project would create job opportunities within the local area and, through increased workers, potentially stimulate expenditure at local businesses. The new infrastructure, particularly the active transport infrastructure and open space proposed by the project, would enhance the number of quality and safe spaces and connections available for the community.

Leichhardt 2025+ Community Strategic Plan

The *Leichhardt 2025+ Community Strategic Plan* was published in 2013 by Leichhardt Council. The Plan was developed in consultation with the community, with community values incorporated into the vision, key outcomes and strategies. **Table 4-3** below outlines community values as described in the Plan and the key service areas and goals.

Table 4-3 Leichhardt 2025+ – Community Strategic Plan – summary of community values and the community vision and strategic directions where relevant to the SEIA

Community values
· **Our local community** – making it the place where we want to live, work, play and visit. · **Democratic responsible government** – open, participative and proactive Council leading the community · **Sustainability** – shared passion and commitment to consistently do all the things required to enhance and preserve the social, environmental, economic and civic leadership factors that are important to the lives of future generations and life on our planet.
Key service areas and goal
· **Community well-being** – A Leichhardt community that is equitable, cohesive, connected, caring, diverse, healthy, safe, culturally active, creative and innovative, and has a strong sense of belonging and place · **Accessibility** – Easy access for people, services, information and facilities that promotes the amenity, health and safety of the community and that reduces private car dependency for all travel · **Place where we live and work** – A liveable place – socially, environmentally and economically · **A sustainable environment** – A sustainable environment created by inspiring, leading and guiding our social, environmental and economic activities · **Business in the community** – Thriving businesses and a vibrant community working together to improve the local economy · **Sustainable services and assets** – Accountable civic leadership that delivers services and assets to support the community now and in the future.

Source: Leichhardt Council 2013, *Leichhardt 2025+*

The project would deliver outcomes that respond to a number of the key themes identified in this Plan. This would be facilitated by reduced traffic congestion for local roads and improved public transport opportunities, provision of new open space and active transport links, particularly along Parramatta and Victoria roads.

Our Place, Our Vision – Marrickville Community Strategic Plan

The *Our Place, Our Vision – Marrickville Community Strategic Plan* was published in 2013 by Marrickville Council. The Plan was developed in consultation with the community and community values and objectives were incorporated into the plans vision, key outcomes and strategies,

Table 4-4 outlines the key community values arising from consultation and key service areas and goals developed by Marrickville Council that are relevant to the SEIA.

Table 4-4 Our Place, Our Vision – Marrickville Community Strategic Plan

Community values (from consultation)
· Keeping streets clean and tackling illegal dumping · Improving the condition of roads and footpaths · Maintaining and improving parks · Addressing graffiti · Creating more accessible and efficient public transport · Maintaining cultural diversity · Greening the area · Cleaning up the Cooks River.
Key service areas and goals
A diverse community that is socially just, educated, safe and healthy · A creative and cultural Marrickville · A vibrant economy and well planned, sustainable urban environment and infrastructure · An innovative, effective, consultative and representative council.

Source: Marrickville Council 2013, *Our Place, Our Vision*

The delivery of the project would result in reduced traffic congestion for local roads and improved public transport opportunities, particularly along Parramatta Road, as outlined in the *Parramatta Road Urban Transformation Program*.

4.4.2 City of Sydney

Sustainable Sydney 2030 – Community Strategic Plan (2013)

The *Sustainable Sydney 2030 – Community Strategic Plan*[17] was published in 2014 by the City of Sydney Council. The Plan was developed in consultation with the community who were asked what kind of city they desired. The results of this consultation and subsequent strategic direction are outlined in **Table 4-5**.

Table 4-5 Sustainable Sydney 2030

Community values (from consultation)
People want a city that is: · Economically prosperous · A leader in environmental management · Liveable, inclusive and culturally alive · Safe to move about in and in a way that is environmentally responsible · Green, global and connected · That offers affordability and social diversity · Where people feel a sense of belonging, connected to the local village, shops and people in the streets, that is beautiful with ribbons of green · Which is friendly · Provides affordable space for creative people · That is globally connected · Which celebrates the outdoors · With efficient use of energy, water, and reduced water · That is an international gateway city to Asia · Where riding a bike is safe and enjoyable · Where economic benefits would be gained by enhancing sustainability · With walkable streets · With environmental leadership · Not clogged by cars · That tells its history · With distinctive precincts · With greater self-sufficiency · That includes indigenous people its future · Which has more green space.
Community vision and strategic directions
Green vision · The city would reduce its greenhouse gas emissions, with a network of green infrastructure to reduce energy, water and wastewater demands, led by major renewal sites · The city would help contain the Sydney regions' urban footprint by planning for new housing opportunities integrated with vital transport, facilities, infrastructure and open space. Connected vision · The city would be easy to get around with a network for walking and cycling, and transit routes connecting the city's villages, city centres and the rest of inner Sydney. The city would be easy to get to with an upgraded regional transit network that builds on the existing network, enhancing access to Sydney's heart from across the region · The city would commit to partnerships and co-operations between governments, the private sector and the community to lead change. The city is part of a wider national and global

[17] City of Sydney 2014, *Sustainable Sydney 2030 – Community Strategic Plan (2014*), City of Sydney

Community values (from consultation)
community and would pursue relationships with other Australian and international cities for cultural, trade and mutually beneficial exchange. Strategic directions for a sustainable Sydney (bold items indication items relevant to the socio-economic impact assessment) include: 1. A globally competitive and innovative city 2. A leading environmental performer 3. Integrated transport for a connected city 4. A city for walking and cycling 5. A lively and engaging city centre 6. Vibrant local communities and economies 7. A cultural and creative city 8. Housing for a diverse population 9. Sustainable development, renewal and design 10. Implementation through effective partnerships.

Source: City of Sydney 2014, *Sustainable Sydney 2030*

The delivery of the project would generally result in reduced traffic congestion for local roads and improved public transport opportunities, particularly along sections of Parramatta Road. The operation of the project would also improve business connectivity, enhancing freight and commercial movement networks, making it easier for companies to do business in Sydney.

4.5 Summary of key points

This SEIA has been prepared in accordance with Roads and Maritime's *Environmental Impact Assessment Practice Note – Socio-economic Assessment (EIA-N05).* A number of relevant state and local government plans and policies have also been identified and reviewed.

The project is consistent with the delivery of many of the proposed outcomes of these reports, particularly through improvements in business efficiency and savings on a regional economic scale. The operation of the project would increase travel speeds and reliability and reduce distances travelled by freight vehicles. The project would relieve road congestion, link communities and businesses, provide new open space, provide new active transport links and create capacity for improved public transport services.

5 Existing environment

This section provides an overview of the socio-economic characteristics of the study area. This background has been informed by the Australian Census of Housing and Population (ABS, 2011)[18], Australian Statistics Business Indicators (ABS 2016), Australian Statistics Business Indicators (ABS 2016) and the Bureau of Transport Statistics (NSW Government). The Greater Sydney Metropolitan area was used as a comparison to enable the precinct areas to be placed into perspective.

5.1 Study area demographic profiles

The study area is shown in **Figure 3-1** and is comprised of the following precincts:

- Ashfield-Haberfield precinct
- Leichhardt-Glebe precinct
- Alexandria-Erskineville precinct.

5.1.1 Ashfield-Haberfield precinct

The Ashfield-Haberfield precinct comprises the ABS SA2 boundaries known as Ashfield, Five Dock-Abbotsford, Burwood-Croydon and Haberfield-Summer Hill. The precinct includes the suburbs of Five Dock, Abbotsford, Ashfield, Haberfield, Summer Hill, Burwood and Croydon.

Precinct population by age distribution

As of 2011, the precinct had a population of about 76,119 residents. A lower proportion of these residents were under the age of 15 years (around 15 per cent) when compared to Greater Sydney (around 19 per cent). However, the precinct contained a higher proportion of residents within the young working family cohort of 15–44 years (around 47 per cent) and older 75+ years cohort (around eight per cent) when compared to Greater Sydney (around 44 per cent and six per cent respectively) (**Table 5-1**).

Table 5-1 Age distribution in the Ashfield-Haberfield precinct

	Category	Ashfield-Haberfield precinct	Greater Sydney
Age distribution	Total persons	76,119	4,391,676
	0-14 years	15.1%	19.2%
	15-29 years	22.4%	21.0%
	30-44 years	24.1%	22.5%
	45-59 years	18.9%	19.2%
	60-74 years	11.3%	11.9%
	75+ years	8.1%	6.1%

Source: Census 2011

Place of birth

The majority of residents within the Ashfield-Haberfield precinct were born in Australia and Oceania. This group comprised about 60 per cent of the population, followed by Asia (around 25 per cent), then Europe (about 12 per cent). This is compared to Greater Sydney where 71 per cent of the population were born in Australia or Oceania, around 15 per cent were born in Asia, and 10 per cent were born in Europe (**Table 5-2**).

[18] The 2016 Australian Census of Population and Housing statistics was not available at the time of analysis

Table 5-2 Place of birth of the Ashfield-Haberfield precinct

	Category	Ashfield-Haberfield precinct	Greater Sydney
Place of birth	Australia or Oceania	59.7%	71.3%
	Europe	12.4%	9.5%
	North Africa or Middle East	1.7%	2.9%
	Asia	25.1%	14.7%
	Americas	0.7%	0.7%
	Sub-Saharan Africa	0.4%	0.9%

Source: Census 2011

Cultural diversity

The precinct's cultural diversity indicators are outlined in **Table 5-3**. The number of people within the precinct that were born overseas (around 44 per cent) and spoke a language other than English (around 46 per cent) was high compared to Greater Sydney (around 40 per cent and 38 per cent respectively). The Aboriginal and Torres Strait Islander population within the precinct (around 0.5 per cent) was low compared to Greater Sydney (1.2 per cent).

Table 5-3 Cultural diversity

	Category	Ashfield-Haberfield precinct		Greater Sydney	
		No. of persons	% of total population	No. of persons	% of total population
Social characteristics	Aboriginal and Torres Strait Islander People	371	0.5%	54,746	1.2%
	People born overseas	33,684	44%	1,759,130	40%
	Language other than English	34,643	46%	1,659,226	38%

Source: Census 2011

Socio-economic Indexes for Areas (SEIFA)

The SEIFA advantage/disadvantage index summarises the household conditions within an area. This index is weighted one to 10, with 10 being the most advantaged. In this precinct the index is eight, slightly lower than the Greater Sydney index of nine. Both eight and nine are considered to be a high score. A high score indicates a relative lack of disadvantage in general. For example, an area may have a high score if there are (among other things): few households with low incomes, few people with no qualifications, and few people in low skilled occupations.

Need for assistance and dependents

Dependents are persons aged 0–14 and those over the age of 65 who are no longer in the workforce. As can be seen in Table 5-4, the precinct recorded a lower proportion of children aged 0–14 (around 15 per cent) compared to Greater Sydney (around 19 per cent). The precinct recorded a higher proportion of people aged 65 years and over (around 15 per cent) compared to Greater Sydney (around 13 per cent). The precinct also recorded a higher proportion of persons needing assistance (around five per cent) compared to Greater Sydney (around four per cent).

Table 5-4 Need for assistance or dependents

	Category	Ashfield-Haberfield precinct		Greater Sydney	
		No. of persons	% of total population	No. of persons	% of total population
Socio-economic characteristics	Need for assistance	4,134	5.4%	192,325	4.4%
	Children aged 0–14	11,488	15.1%	843,213	19.2%
	People aged 65 years and over	11,174	14.7%	564,444	12.9%

Source: Census 2011

Residential dwelling characteristics

As of 2011, there were around 28,121 occupied private dwellings within the precinct. A significant proportion of these were apartment-style dwellings (around 47 per cent), which was significantly higher than Greater Sydney (around 26 per cent) (**Table 5-5**).

Table 5-5 Residential dwelling characteristics within Ashfield-Haberfield precinct

	Category	Ashfield-Haberfield precinct	Greater Sydney
Residential dwelling characteristics	Separate house	40.5%	60.9%
	Townhouse	12.0%	12.8%
	Flat-unit-apartment	46.7%	25.8%
	Other dwelling	0.6%	0.5%
	Not stated	0.1%	0.1%

Source: Census 2011

Home ownership and household structure

Reflective of an area with a high proportion of apartment style living and a young workforce was the higher proportion of residents renting (around 39 per cent), when compared to Greater Sydney (around 32 per cent). Family households comprised 72 per cent of household structures and over half the population owned or were in the process of purchasing a house (around 57 per cent) (**Table 5-6**).

Table 5-6 Home ownership and household structure in Ashfield-Haberfield precinct

	Category	Ashfield-Haberfield precinct	Greater Sydney
Home ownership	Owned or being purchased	57.3%	65.2%
	Rented	39.4%	31.6%
	Other/not stated	3.3%	3.2%
Household structure	Family households	72.4%	73.1%
	Lone person households	20.4%	22.6%
	Group households	7.3%	4.3%

Source: Census 2011

Median incomes and rent per week

In 2011 the median household income for the precinct was $1,493 per week, which was slightly greater than the median weekly household income of Greater Sydney ($1,447). Personal income in the precinct was $640 per week, which was higher than Greater Sydney at $619 per week. Median rent however was also higher at $401 per week, compared to Greater Sydney, which recorded a median weekly rent of $351 per week (**Table 5-7**).

Table 5-7 Median household and personal income and rent per week within Ashfield-Haberfield precinct

	Category	Ashfield-Haberfield precinct	Greater Sydney
Economic medians	Median total personal income ($/weekly)	$640	$619
	Median total household income ($/weekly)	$1,493	$1,447
	Median rent ($/weekly)	$401	$351

Source: Census 2011

Education characteristics

Fifty-three per cent of residents within the precinct had attained a higher education qualification (that is, above the level of Higher School Certificate); this is high compared to 48 per cent of residents across Greater Sydney (**Table 5-8**).

Table 5-8 Higher education level attained for Ashfield-Haberfield precinct

	Category	Ashfield-Haberfield precinct	Greater Sydney
Education	Postgraduate Degree Level	8.9%	5.6%
	Graduate Diploma and Graduate Certificate Level	2.1%	1.6%
	Bachelor Degree Level	21.7%	16.9%
	Advanced Diploma and Diploma Level	9.5%	9.0%
	Certificate Level	10.9%	15.2%
	Level of education inadequately described	2.1%	2.0%

Source: Census 2011, count of persons over 15 years. Not Stated category not expressed.

Employment characteristics

As of 2011, there were around 64,631 residents aged 15 years and over within the precinct. Of these residents, around 65 per cent were employed. The precinct had a high proportion of residents employed in 'white collar' occupations (around 43 per cent) and a comparatively low proportion of residents employed in 'blue collar' occupations (around 18 per cent) when compared to Greater Sydney (around 37 per cent and 24 per cent respectively) (**Table 5-9**).

Table 5-9 Ashfield-Haberfield precinct employment characteristics

	Category	Ashfield-Haberfield precinct	Greater Sydney
Employment characteristics	Blue collar	18.2%	23.8%
	Community/service	31.3%	32.0%
	White collar	42.9%	36.6%
	Unemployment	5.8%	5.7%

Source: Census 2011

Key resident employment industries

The top four employment industries in this precinct are described in **Table 5-10**, compared to the top four employment industries of Greater Sydney as per **Table 5-11**.

Table 5-10 Resident employment characteristics of Ashfield-Haberfield precinct

	Category	Ashfield-Haberfield precinct
Employment characteristics	Health care and social assistance	12%
	Professional, scientific and technical services	11%
	Retail trade	9%
	Education and training	9%

Source: TPA 2011

Table 5-11 Resident employment characteristics of Greater Sydney

	Category	Greater Sydney
Employment characteristics	Health care and social assistance	11%
	Retail trade	10%
	Professional, scientific and technical services	10%
	Manufacturing	8%

Source: TPA 2011

Travel to work

As identified in **Table 5-12**, 47 per cent of employed people living within the precinct stated that driving was their primary method of getting to work, this is low when compared to Greater Sydney (around 60 per cent).

Table 5-12 Resident of the travel mode to work (TPA) in the Ashfield-Haberfield precinct

Travel mode to work as of 2011		Ashfield-Haberfield Precinct		Greater Sydney	
Category		**Number**	**Percentage**	**Number**	**Percentage**
Car		17,655	47%	1,203,441	59%
Rail		9,420	25%	283,237	14%
Bus		2,653	7%	119,057	6%
Walking		1,449	4%	83,242	4%
Cycling		431	1%	15,604	1%
Other[19]		6,481	16%	348,215	17%

Source: TPA Journey to work 2011

Of those that travelled to the precinct for work (**Table 5-13**), around 58 per cent travelled by private car and 19 per cent travelled by public transport (around 16 per cent by rail and three per cent by bus).

19 Travel modes include: motorbike, did not go to work, tram, truck, other mode, taxi, worked at home, ferry and mode not stated.

Table 5-13 Primary travel mode of all workers travelling to jobs in the Ashfield-Haberfield precinct (TPA)

Travel mode to work as of 2011	Ashfield-Haberfield Precinct		Greater Sydney	
Category	**Number**	**Percentage**	**Number**	**Percentage**
Car 	15,813	58%	1,161,486	57%
Rail 	4,408	16%	284,501	14%
Bus 	902	3%	118,618	6%
Walking 	1,462	5%	83,437	4%
Cycling 	170	1%	15,490	1%
Other 	4,634	17%	338,735	17%

Source: TPA Journey to work data 2011

Vehicle ownership

As seen in **Table 5-14**, in the Ashfield-Haberfield precinct, around 44 per cent of occupied private dwellings had one registered motor vehicle garaged or parked at their address, around 28 per cent had two registered motor vehicles and seven per cent had three or more registered motor vehicles. Eighteen per cent of occupied private dwellings did not have a vehicle and relied on other transport modes.

Table 5-14 Vehicle ownership count of private occupied dwellings Ashfield-Haberfield precinct

	Category	Ashfield-Haberfield Precinct		Greater Sydney	
		Number	**Percentage**	**Number**	**Percentage**
Social characteristics	Households with no vehicles	5,142	18%	183,592	12%
	Households with one vehicle	12,839	44%	583,254	38%
	Households with two vehicles	8,245	28%	500,133	33%
	Households with three or more vehicles	2,059	7%	206,732	14%
	Number of motor vehicles or dwelling structure not stated	837	3%	47,681	3%

Source: Census 2011

Precinct population and employment projections

The TPA forecast shows that the population of the precinct would reach 111,067 persons by 2036, representing an increase of 24,759 persons (around 29 per cent) over its 2016 base population projection of 83,308 residents.

Employment within the precinct is forecast to increase from 32,442 jobs to 41,429 jobs by 2036. This represents an increase of 8,987 jobs or around 28 per cent over the period. **Table 5-15** summarises the projected change in demographic indicators for the precinct.

Table 5-15 Ashfield-Haberfield precinct demographic projections

	2016	2026	2036	Change	% change
Population	86,308	99,907	111,067	24,759	29%
Employment	32,442	36,726	41,429	8,987	28%
Workforce	46,991	54,132	60,041	13,050	28%

Source: TPA Population and Employment Projections 2014

5.1.2 Leichhardt-Glebe precinct

The Leichhardt-Glebe precinct comprises the SA2 boundaries known as Leichhardt-Annandale, Lilyfield-Rozelle, Balmain and Glebe-Forest Lodge. The precinct includes the suburbs of Glebe, Forest Lodge, Balmain, Rozelle, Lilyfield, Annandale, Leichhardt and a portion of Camperdown.

Precinct population by age

As of 2011, the precinct had a population of around 68,800 residents. A lower proportion of these residents were under the age of 15 years (around 15 per cent) when compared to Greater Sydney (around 19 per cent). However, the precinct contained a higher proportion of residents within the young working family cohort of 15–44 years (around 51 per cent) when compared to Greater Sydney (around 44 per cent) (**Table 5-16**).

Table 5-16 Age distribution of the Leichhardt-Glebe precinct

	Category	Leichhardt-Glebe precinct	Greater Sydney
Age distribution	**Total persons**	68,779	4,391,676
	0–14 years	15.1%	19.2%
	15–29 years	19.4%	21.0%
	30–44 years	31.2%	22.5%
	45–59 years	18.9%	19.2%
	60–74 years	11.2%	11.9%
	75+ years	4.2%	6.1%

Source: Census 2011

Place of birth

The majority of residents within the Leichhardt-Glebe precinct (in 2011) were born in Australia and Oceania (about 76 per cent), followed by Europe (around 15 per cent), then Asia (about seven per cent). This is compared to Greater Sydney where 71 per cent of the population were born in Australia or Oceania and about 15 per cent and about 10 per cent of the population were born in Asia or Europe respectively (**Table 5-17**).

Table 5-17 Place of birth of the Leichhardt-Glebe precinct

	Category	Leichhardt-Glebe precinct	Greater Sydney
Place of Birth	Australia or Oceania	75.5%	71.3%
	Europe	14.5%	9.5%
	North Africa and Middle East	0.6%	2.9%
	Asia	6.9%	14.7%
	Americas	1.8%	0.7%
	Sub-Saharan Africa	0.7%	0.9%

Source: Census 2011

Cultural diversity

The precinct's cultural diversity indicators are outlined in **Table 5-18**. Within the precinct, around 30 per cent of residents were born overseas and 17 per cent of people spoke a language other than English. Greater Sydney recorded a higher number of people born overseas (around 40 per cent) and a higher number of people who spoke a language other than English (38 per cent). The Aboriginal and Torres Strait Islander population within the precinct (around 0.5 per cent) was low compared to Greater Sydney at 1.2 per cent.

Table 5-18 Cultural diversity

	Category	Leichhardt-Glebe precinct		Greater Sydney	
		Number of persons	% of total population	Number of persons	% of total population
Social characteristics	Aboriginal and Torres Strait Islander people	869	0.5%	54,746	1.2%
	People born overseas	20,563	29.9%	1,759,130	40%
	Speaks a language other than English	11,366	17%	1,659,226	38%

Source: Census 2011

Socio-economic Indexes for Areas (SEIFA)

The advantage/disadvantage index summarises the household conditions within an area. This index was weighted 1–10 with 10 being the most advantaged. In this precinct, the index was 9.5, higher than the Greater Sydney index of nine.

Need for assistance and dependents

Dependents are persons aged 0–14 and those over the age of 65 who are no longer in the workforce. As can be seen in **Table 5-19**, the precinct recorded a lower proportion of children aged 0–14 (around 15 per cent) compared to Greater Sydney (around 19 per cent). The precinct also recorded a lower proportion of people aged 65 years and over (around 10 per cent) compared to Greater Sydney (around 13 per cent). The precinct recorded a lower proportion of persons needing assistance (around one per cent) compared to Greater Sydney (around four per cent).

Table 5-19 Need for assistance or dependents

	Category	Leichhardt-Glebe precinct		Greater Sydney	
		No. of persons	% of total population	No. of persons	% of total population
Socio-economic characteristics	Need for assistance	2,173	1.2%	192,325	4.4%
	Children aged 0–14	10,354	15%	843,213	19.2%
	People aged 65 years and over	6,910	10%	564,444	12.9%

Source: Census 2011

Residential dwelling characteristics

As of 2011, there were 28,710 occupied private dwellings within this precinct. A significant proportion of these were apartment style dwellings (around 34 per cent), which was higher than Greater Sydney where 26 per cent of dwellings were identified as apartments. Townhouses were the primary form of housing within the Leichhardt-Glebe precinct, contributing 37 per cent compared to Greater Sydney's 13 per cent (**Table 5-20**).

Table 5-20 Residential dwelling characteristics within Leichhardt-Glebe precinct

	Category	Leichhardt-Glebe precinct	Greater Sydney
Residential dwelling characteristics	Separate house	28.1%	60.9%
	Townhouse	37.0%	12.8%
	Flat-unit-apartment	33.8%	25.8%
	Other dwelling	1.1%	0.5%
	Not stated	0.1%	0.1%

Source: Census 2011

Home ownership and household structure

Reflective of an area with a high proportion of apartment style living and a young workforce was the higher proportion of residents renting (around 46 per cent), when compared to Greater Sydney (around 32 per cent). Family households comprised (around 65 per cent) of all households and just over half the population owned or were in the process of purchasing a house (around 52 per cent) (**Table 5-21**).

Table 5-21 Home ownership and household structure in Leichhardt-Glebe precinct

	Category	Leichhardt-Glebe precinct	Greater Sydney
Home ownership	Owned or being purchased	52.1%	65.2%
	Rented	45.5%	31.6%
	Other/not stated	2.4%	3.2%
Household structure	Family households	64.6%	73.1%
	Lone person households	25.9%	22.6%
	Group households	9.5%	4.3%

Source: Census 2011

Median incomes and rent per week

The median household income for the precinct was $2,062 per week in 2011. This was higher than the median weekly household income of Greater Sydney at $1,447 per week. Personal income in the precinct was $1,033 per week, which was also higher than Greater Sydney at $619 per week. Median rent was higher in the precinct at $455 per week, compared to Greater Sydney, which was $351 per week (**Table 5-22**).

Table 5-22 Median household and personal income and rent per week within Leichhardt-Glebe precinct

	Category	Leichhardt-Glebe precinct	Greater Sydney
Economic medians	Median total personal income ($/weekly)	$1,033	$619
	Median total household income ($/weekly)	$2,062	$1,447
	Median rent ($/weekly)	$455	$351

Source: Census 2011

Education characteristics

Sixty-three per cent of residents within the precinct had attained a higher education qualification (above High School Certificate); this is relatively high compared to 48 per cent of residents across Greater Sydney (**Table 5-23**).

Table 5-23 Education characteristics within Leichhardt-Glebe precinct

	Category	Leichhardt-Glebe precinct	Greater Sydney
Education	Postgraduate Degree level	12.1%	5.6%
	Graduate Diploma and Graduate Certificate level	3.4%	1.6%
	Bachelor Degree level	28.9%	16.9%
	Advanced Diploma and Diploma level	9.1%	9.0%
	Certificate level	9.3%	15.2%
	Level of education inadequately described	10.6%	2.0%

Source: Census 2011, count of persons over 15 years, Not Stated category not expressed

Employment characteristics

As of 2011, there were 58,425 residents aged 15 years and over within the precinct. Of these residents, 67 per cent were employed. The precinct had a high proportion of residents employed in 'white collar' occupations (around 59 per cent) and a comparatively low proportion of residents within 'blue collar' occupations (around 10 per cent) when compared to Greater Sydney (around 37 per cent and 24 per cent respectively) (**Table 5-24**).

Table 5-24 Leichhardt-Glebe precinct employment characteristics

	Category	Leichhardt-Glebe precinct	Greater Sydney
Employment characteristics	Blue collar	10.3%	23.8%
	Community/service	25.2%	32.0%
	White collar	58.7%	36.6%
	Unemployment	4.5%	5.7%

Source: Census 2011. Inadequately described and Not Stated categories not expressed

Key resident employment industries

The top four employment industries in this precinct were as per **Table 5-25**, compared to the top four employment industries of Greater Sydney as per **Table 5-26**.

Table 5-25 Employment characteristics of Leichhardt-Glebe precinct

	Category	Leichhardt-Glebe precinct
Employment characteristics	Professional, scientific and technical services	17%
	Education and training	10%
	Health care and social assistance	10%
	Financial and insurance services	10%

Source: TPA 2011

Table 5-26 Employment characteristics of Greater Sydney

Category	Category	Greater Sydney
Employment characteristics	Health care and social assistance	11%
	Retail trade	10%
	Professional, scientific and technical services	10%
	Manufacturing	8%

Source: TPA 2011

Travel to work methods

As shown in **Table 5-27** 43 per cent of employed residents stated that driving was their primary method of travelling to work in 2011, compared to 60% for Greater Sydney.

Table 5-27 Resident travel mode to work in the Leichhardt-Glebe precinct (TPA)

Travel mode to work as of 2011	Leichhardt-Glebe Precinct		Greater Sydney	
Category	**Number**	**Percentage**	**Number**	**Percentage**
Car 	16,981	43%	1,203,441	59%
Rail 	2,058	5%	83,242	4%
Bus 	8,167	21%	283,237	14%
Walking 	3,150	8%	119,057	6%
Cycling 	1,217	5%	15,604	1%
Other 	8,371	21%	348,215	17%

Source: TPA Journey to work data 2011

Of the approximate 27,000 jobs provided within the precinct, 6,960 were local resident employees. Of these workers, 56 per cent travelled to work by private car, seven per cent walked while only eight per cent travel by rail and eight per cent travel by bus (see **Table 5-28**).

Table 5-28 Primary travel mode of all workers travelling to jobs in the Leichhardt-Glebe precinct (TPA)

Travel mode to work as of 2011	Leichhardt-Glebe Precinct		Greater Sydney	
Category	**Number**	**Percentage**	**Number**	**Percentage**
Car 	15,105	56%	1,161,486	57%
Rail 	2,155	8%	284,501	14%
Bus 	2,060	8%	118,618	6%
Walking 	1,967	7%	83,437	4%
Cycling 	346	1%	15,490	1%
Other 	5,363	20%	338,735	17%

Source: TPA Journey to work data 2011

Vehicle ownership

In the Leichhardt-Glebe precinct, 49 per cent of occupied private dwellings had one registered motor vehicle garaged or parked at their address, 24 per cent had two registered motor vehicles and four per cent had three or more registered motor vehicles. Nineteen per cent of occupied private dwellings did not have a vehicle (see **Table 5-29**).

Table 5-29 Vehicle ownership count of private occupied dwellings Leichhardt-Glebe precinct

	Category	Leichhardt-Glebe precinct		Greater Sydney	
		Number	Percentage	Number	Percentage
Socio-economic characteristics	Households with no vehicles	5,474	19%	183,592	12%
	Households with one vehicle	14,207	49%	583,254	38%
	Households with two vehicles	7,012	24%	500,133	33%
	Households with three or more vehicles	1,252	4%	206,732	14%
	Number of motor vehicles or dwelling structure not stated	759	3%	47,681	3%

Source: Census 2011

Population and employment projections

The TPA forecasts that the population of the precinct would reach 95,808 persons by 2036, representing an increase of 19,634 persons or 26 per cent over its 2016 base population of 76,174 residents.

Employment within the precinct is forecast to increase from 32,128 jobs to 39,307 jobs by 2036. This represents an increase of 7,179 jobs or around 22 per cent over the period. The workforce in the area is also projected to increase by around 24 per cent from 46,155 in 2016 to 57,324. **Table 5-30** summarises the projected change in demographic indicators for the precinct.

Table 5-30 Leichhardt-Glebe precinct demographic projections

	2016	2026	2036	Change	% change
Population	76,174	85,943	95,808	19,634	26%
Employment	32,128	35,503	39,307	7,179	22%
Workforce	46,155	51,939	57,324	11,169	24%

Source: TPA Population and Employment Projections 2014

5.1.3 Alexandria-Erskineville precinct

The Alexandria-Erskineville precinct comprises the SA2 boundaries known as Sydenham-Tempe-St Peters, Redfern-Chippendale, Erskineville-Alexandria, Newtown-Camperdown-Darlington and Petersham-Stanmore. The precinct comprises the suburbs of Erskineville, Alexandria, Newtown, Darlington, Redfern, Chippendale, Eveleigh, Sydenham, Tempe, St Peters, Petersham, Stanmore and a proportion of Enmore and Camperdown.

Precinct population by age

As of 2011, the precinct had a population of around 77,973 residents. The age profile of the Alexandria-Erskineville precinct is younger than Greater Sydney. This was evident in the median age of Alexandria-Erskineville precinct being 33 years compared to 36 years for Greater Sydney in 2011.

A lower proportion of these residents were under the age of 15 years (around 11 per cent) when compared to Greater Sydney (around 19 per cent). However, the precinct contained a higher proportion of residents within the young working family cohort of 15–44 years (around 62 per cent) when compared to Greater Sydney (around 44 per cent) (**Table 5-31**).

Table 5-31 Age distribution of the Alexandria-Erskineville precinct

	Category	Alexandria-Erskineville precinct	Greater Sydney
	Total persons	77,973	4,391,676
Age distribution	0–14 years	10.5%	19.2%
	15–29 years	28.8%	21.0%
	30–44 years	33.0%	22.5%
	45–59 years	16.6%	19.2%
	60–74 years	7.9%	11.9%
	75+ years	3.2%	6.1%

Source: Census 2011

Place of birth

The majority of residents within the Alexandria-Erskineville precinct were born in Australia and Oceania (about 72 per cent), followed by Europe (around 12 per cent), then Asia (around 12 per cent). This is compared to Greater Sydney where 71 per cent of the population were born in Australia or Oceania and about 15 per cent and about 10 per cent of the population were born in Asia and Europe respectively (**Table 5-32**).

Table 5-32 Place of birth of the Alexandria-Erskineville precinct

	Category	Alexandria-Erskineville precinct	Greater Sydney
Place of birth	Australia or Oceania	72.2%	71.3%
	Europe	12.1%	9.5%
	North Africa and Middle East	0.9%	2.9%
	Asia	12.4%	14.7%
	Americas	1.8%	0.7%
	Sub-Saharan Africa	0.6%	0.9%

Source: Census 2011

Cultural diversity

The precinct's cultural diversity indicators are outlined in Table 5-33. Within the precinct 38 per cent of residents were born overseas and about 29 per cent of people spoke a language other than English. Greater Sydney recorded a higher number of people born overseas (around 40 per cent) and higher number of people who spoke a language other than English (around 38 per cent). The Aboriginal and Torres Strait Islander population within the precinct (around 1.3 per cent) was higher than that of Greater Sydney (around 1.2 per cent).

Table 5-33 Cultural diversity

	Category	Alexandria-Erskineville precinct		Greater Sydney	
		No. of persons	% of total population	No. of persons	% of total population
Socio-economic characteristics	Aboriginal and Torres Strait Islander people	1,214	1.3%	54,746	1.2%
	People born overseas	29,575	38%	1,759,130	40%
	Language other than English	22,352	29%	1,659,226	38%

Source: Census 2011

Socio-economic Indexes for Areas (SEIFA)

The advantage/disadvantage index summarises the household conditions within an area. This index was weighted 1–10 with 10 being the most advantaged. In this precinct the index is 8.75, slightly lower than the Greater Sydney index of nine.

Need for assistance and dependents

Dependents are persons aged 0–14 and over the age of 65 who are no longer in the workforce. As can be seen in **Table 5-34**, the precinct recorded a lower proportion of children aged 0–14 (seven per cent) compared to Greater Sydney (around 19 per cent). The precinct recorded a lower proportion of people aged 65 years and over (around eight per cent) compared to Greater Sydney (around 13 per cent). The precinct also recorded a lower proportion of persons needing assistance (around two per cent) compared to Greater Sydney (around four per cent).

Table 5-34 Need for assistance or dependents

	Category	No. of persons	% of total population	Greater Sydney	% of total population
Socio-economic characteristics	Need for assistance	1,752	2.2%	192,325	4.4%
	Children aged 0–14	8,178	10.%	843,213	19.2%
	People aged 65 years and over	5,868	7.5%	564,444	12.9%

Source: Census 2011

Residential dwelling characteristics

As of 2011, there were 32,643 occupied private dwellings within the precinct. A significant proportion of these were apartment style dwellings (around 50 per cent), which was higher than Greater Sydney (around 26 per cent) (**Table 5-35**).

Table 5-35 Residential dwelling characteristics within Alexandria-Erskineville precinct

	Category	Alexandria-Erskineville precinct	Greater Sydney
Residential dwelling characteristics	Separate house	15.4%	60.9%
	Townhouse	37.1%	12.8%
	Flat-unit-apartment	46.4%	25.8%
	Other dwelling	0.9%	0.5%
	Not stated	0.3%	0.1%

Source: Census 2011

Home ownership and household structure

Reflective of an area with a high proportion of apartment style living and a young workforce was the higher proportion of residents renting (around 51 per cent), when compared to Greater Sydney (around 32 per cent), while 46 per cent of households were owned or being purchased. Family households comprised 53 per cent of households within the precinct compared to 73% in Greater Sydney (**Table 5-36**).

Table 5-36 Home ownership and household structure in Alexandria-Erskineville precinct

	Category	Alexandria-Erskineville precinct	Greater Sydney
Home ownership	Owned or being purchased	46.2%	65.2%
	Rented	51.3%	31.6%
	Other/not stated	2.5%	3.2%
Household structure	Family households	52.6%	73.1%
	Lone person households	31.2%	22.6%
	Group households	16.2%	4.3%

Source: Census 2011

Median incomes and rent per week

The median household income for the precinct was $1,763 per week in 2011. This was slightly higher than the median weekly household income of Greater Sydney, which was $1,447 per week. Personal income in the precinct was $900 per week, which was higher than Greater Sydney at $619 per week. Median rent was also higher at $429 per week, compared to Greater Sydney, which recorded a weekly rent of $351 per week (**Table 5-37**).

Table 5-37 Median household and personal income and rent per week within Alexandria-Erskineville precinct

	Category	Alexandria-Erskineville precinct	Greater Sydney
Economic medians	Median total personal income ($/weekly)	$900	$619
	Median total household income ($/weekly)	$1,763	$1,447
	Median rent ($/weekly)	$429	$351

Source: Census 2011

Education characteristics

Fifty per cent of residents within the precinct had attained a higher education qualification (above High School Certificate). This was slightly higher Greater Sydney at 48 per cent (**Table 5-38**).

Table 5-38 Higher education level attained within Alexandria-Erskineville precinct

	Category	Alexandria-Erskineville precinct	Greater Sydney
Education	Postgraduate Degree level	2.7%	5.6%
	Graduate Diploma and Graduate Certificate level	27.1%	1.6%
	Bachelor Degree level	8.9%	16.9%
	Advanced Diploma and Diploma level	9.7%	9.0%
	Certificate level	1.6%	15.2%
	Level of education inadequately described	12.7%	2.0%

Source: Census 2011, count of persons over 15 years, Not Stated category not expressed

Employment characteristics

As of 2011, there were around 69,795 residents aged 15 years or over within the precinct. Unemployment in the Alexandria-Erskineville precinct was five per cent, which was lower than the Greater Sydney region (around six per cent). The precinct had a high proportion of residents employed in 'white collar' occupations (around 52 per cent) and a comparatively low proportion of

residents within 'blue collar' occupations (around 13 per cent) when compared to Greater Sydney (around 37 per cent and 24 per cent respectively) (**Table 5-39**).

Table 5-39 Alexandria-Erskineville precinct employment characteristics

	Category	Alexandria-Erskineville precinct	Greater Sydney
Employment characteristics	Blue Collar	13.2%	23.8%
	Community/service	28.4%	32.0%
	White Collar	51.8%	36.6%
	Unemployment	5.2%	5.7%

Source: Census 2011, inadequately described and Not Stated categories not expressed

Key resident employment industries

The top four employment industries in this precinct were as per **Table 5-40**, compared to the top four employment industries of Greater Sydney as per **Table 5-41**.

Table 5-40 Employment characteristics of Ashfield-Haberfield precinct

	Category	Alexandria-Erskineville precinct
Employment characteristics	Professional, scientific and technical services	15%
	Education and training	10%
	Health care and social assistance	9%
	Financial and insurance services	8%

Source: TPA 2011

Table 5-41 Employment characteristics of Greater Sydney

	Category	Greater Sydney
Employment characteristics	Health care and social assistance	11%
	Retail trade	10%
	Professional, scientific and technical services	10%
	Manufacturing	8%

Source: TPA 2011

Travel to work methods

As identified in **Table 5-42**, 31 per cent of employed residents stated that driving was their primary method of travel to work in 2011, compared to 60% across Greater Sydney.

Table 5-42 Resident travel mode to work in the Alexandria-Erskineville precinct

Travel mode to work as of 2011		Alexandria-Erskineville Precinct			
Category		**Number**	**Percentage**	**Number**	**Percentage**
Car		14,734	31%	1,203,441	59%
Rail		11,862	25%	283,237	14%
Bus		5,315	11%	119,057	6%
Walking		5,383	11%	83,242	4%
Cycling		2,041	4%	15,604	1%
Other		7,610	16%	348,215	17%

Source: TPA Journey to work data 2011

Of those employed within the precinct about 52 per cent travelled to work by private car, 18 per cent travelled by rail, seven per cent walked, and six per cent travelled by bus (**Table 5-43**).

Table 5-43 Primary travel mode of all workers travelling to jobs in the Alexandria-Erskineville precinct (TPA)

Travel mode to work as of 2011		Alexandria-Erskineville Precinct		Greater Sydney	
Category		**Number**	**Percentage**	**Number**	**Percentage**
Car		32,069	52%	1,161,486	57%
Rail		11,337	18%	284,501	14%
Bus		3,441	6%	118,618	6%
Walking		4,262	7%	83,437	4%
Cycling		1,322	2%	15,490	1%
Other		10,184	17%	354,225	17%

Source: TPA Journey to work data 2011

Vehicle ownership

As seen in **Table 5-44**, in the Alexandria-Erskineville precinct, about 49 per cent of occupied private dwellings had one registered motor vehicle garaged or parked at their address, 16 per cent had two registered motor vehicles and three per cent had three or more registered motor vehicles. Twenty-nine per cent of occupied private dwellings did not have a vehicle and relied on other transport sources.

Table 5-44 Vehicle ownership count of private occupied dwellings Alexandria-Erskineville precinct

	Category	Alexandria-Erskineville precinct		Greater Sydney	
		Number	Percentage	Number	Percentage
Socio-economic characteristics	Households with no vehicles	8,923	29%	183,592	12%
	Households with one vehicle	16,083	49%	583,254	38%
	Households with two vehicles	5,552	16%	500,133	33%
	Households with three or more vehicles	1,092	3%	206,732	14%
	Number of motor vehicles or dwelling structure not stated	987	3%	47,681	3%

Source: ABS Census of Population and Housing – Census 2011

Population and employment projections

The TPA forecasts that the population of the precinct would reach 120,520 persons by 2036, representing an increase of 30,545 persons or 34 per cent over its 2016 population of 89,975[20].

Employment within the precinct is forecast to increase from 74,665 jobs to 97,575 jobs by 2036. This represents an increase of 22,910 jobs or 31 per cent over the period. **Table 5-45** summarises the projected change in demographic indicators for the precinct.

Table 5-45 Alexandria-Erskineville precinct demographic projections

	2016	2026	2036	Change	% change
Population	89,975	102,968	120,520	30,545	34%
Employment	74,665	86,946	97,575	22,910	31%
Workforce	56,160	62,564	71,916	15,756	28%

Source: TPA Journey to work data 2014

5.1.4 Summary of key findings

- As of 2011, the study area (all three precincts combined) had a population of 222,871 residents with the largest precinct being the Alexandria-Erskineville precinct (77,973)
- The study area's community was culturally diverse. The Ashfield-Haberfield precinct recorded over 44 per cent of residents born overseas and 46 per cent speaking a language other than English. The Alexandria-Erskineville precinct had the largest population of Aboriginal and Torres Straight Islanders of all three precincts (about 1.3 per cent), which is higher than Greater Sydney (about 1.2 per cent)

[20] The TPA considers the Census an undercount and adjusts its estimates accordingly.

- The study area had a similar lower population of people that need assistance (four per cent) compared to Greater Sydney (about 4.4 per cent). This includes people who required assistance for one or more of the three core activity areas of self-care, mobility and communication, because of a disability, long-term health condition (lasting six months or more) or old age.
- The study area had a lower proportion of children under 15 years (about 14 per cent) and persons aged over 65 years (about 11 per cent) compared to Greater Sydney (about 19 per cent and 12 per cent respectively). Of the three precincts, the Ashfield-Haberfield precinct contained the highest proportion of persons aged over 65 (about 15 per cent) and children under 15 years (about 15 per cent)
- The rate of unemployment in the study area (about five per cent) was slightly lower than Greater Sydney (about 5.7 per cent) overall. Ashfield-Haberfield had the highest unemployment rate (about 5.8 per cent)
- The study area contained a higher proportion of educated persons and professionals with high personal and median household incomes than Greater Sydney
- As of 2011, the study area contained 142,751 jobs with major industries being professional, scientific and technical services (about 15 per cent), health care and social assistance (about 10 per cent), education and training (about 9 per cent)
- There was a high home ownership rate across all precincts ranging from 46 per cent to 57 per cent. This was still however lower than the Greater Sydney rate of about 65 per cent. The Alexandria-Erskineville precinct had the highest percentage of renters (about 51 per cent)
- Family households were the most prevalent across all precincts. Alexandria-Erskineville had a large percentage of group households (around 16 per cent) compared to Greater Sydney (four per cent)
- Private vehicles were the predominant mode of transport for people living in the study area. All of the precincts had a higher proportion of rail and bus users in comparison to Greater Sydney
- Vehicle ownership across the study area averaged 0.9 vehicles per household, which was lower than the Greater Sydney average of 1.6 vehicles per household.

5.2 Social Infrastructure

This section provides an overview of key social infrastructure located within the study area (the Ashfield-Haberfield, Leichhardt-Glebe and Alexandria–Erskineville precincts) and identifies those located within close proximity of the project footprint.

Defining social infrastructure

Social infrastructure includes assets that accommodate social services or facilities that are used for the physical, social, cultural or intellectual development or welfare of the community. Social infrastructure may include physical infrastructure such as schools, libraries and the services, activities and programs that operate within these facilities. Open spaces, parks, recreation areas and sporting fields that support sport, recreational and leisure uses are also included in this definition.

Social infrastructure facilities generally operate at three levels of provision: local, district and regional. These are defined by the scale of the population catchment they are intended to serve, as well as the absolute physical distances involved. For example, a public primary school serves a local catchment, generally at a suburb level. However, a secondary school would seek to serve a wider catchment (serves multiple suburbs) and a university would cater for a significantly wider catchment (serves multiple LGAs).

In conducting an audit of social infrastructure for this report, local, district and regional facilities within the study area were identified. These facilities are identified in **Table 5-46** along with the catchments that they serve. As such, the audit provides an important indication of the type, number, and importance of these facilities within the study area.

The audit is indicative and based on the data available at the time of preparing report. This audit was sourced from various data points including Core List Australia (2016), local council social infrastructure lists, Google and MapInfo Geographical Information System (GIS). Due to errors in this

base data, facilities not being registered or the facility not having a virtual presence some facilities may not have been recorded.

Table 5-46 Social Infrastructure included within the audit

	Local	District	Regional
Childcare and educational facilities	· Primary school · Long day care · Preschool · Out of school hours care	· Secondary school	· Tertiary institution
Community facilities, libraries and places of worship	· Branch library · Meeting space · Community centre · Places of worship	· District library · Multipurpose community centre/community hub	
Health and emergency facilities	· Medical centre	· Integrated health clinic · Police shopfront · Ambulance standby point	· Hospital · Police station · Ambulance station
Sport, recreation and leisure facilities	· Playground · Outdoor sports court ie tennis or basketball court · Ovals and sports field · Neighbourhood open space and park	· Multi-purpose community/ neighbourhood sports centre · Indoor sport facility	· Sportsground (5 ha) · Indoor sports court and recreation centre · Multi-purpose leisure/aquatic centre · Passive open space (> 5 ha)

A range of community facilities of local, district and regional importance are located in the study area. The following sections identifies the childcare and education facilities; community and cultural facilities; community health facilities and sport, recreation and leisure facilities.

5.2.1 Childcare and education facilities

Catchments for childcare centres and primary schools are local in nature, primarily serving the needs of the local community. Secondary schools are district level facilities as they often draw from a wider catchment. Families are willing to travel further to enrol within schools with particular personal meaning, reputation or history.

At the time of undertaking the report, the study area contained a wide range of educational facilities including around 110 childcare centres, 50 primary schools, 15 secondary schools, three combined primary-secondary schools and 20 tertiary (higher education) educational facilities.

The University of Sydney is located in the north of the Alexandria-Erskineville precinct. In 2015, the university employed over 3,400 academic staff and enrolled over 54,000 students, of which 10,000 were international students. The university attracted over $400 million in federal research funding that year[21].

Table 5-47 provides a summary of the childcare and educational facilities within the study.

[21] Sydney University annual report 2015.

Table 5-47 Identified childcare and education facilities within the study area

Precinct	Provision	Facility types	No. of facilities
Ashfield-Haberfield	Local	Child care centres	37
	Local	Primary schools	11
	District	Secondary school	7
	District	Combined (primary and secondary)	3
	Regional	Tertiary	4
Leichhardt-Glebe	Local	Child care centres	34
	Local	Primary school	18
	District	Secondary school	6
	Regional	Tertiary	11
Alexandria-Erskineville	Local	Child care centres	39
	Local	Primary school	18
	District	Secondary school	3
	Regional	Tertiary	6

Source: Core List Australia 2016, Council Social Infrastructure Lists, Google and MapInfo GIS

Table 5-48 provides a summary of the childcare and educational facilities located within close proximity to the project footprint.

Table 5-48 Identified childcare and educational facilities within close proximity to the construction ancillary facilities

Precinct	Construction site	Provision	Facility types	No. of facilities	Name of facility
Ashfield-Haberfield	C1a, C2a and C3a	Local	Childcare	8	· The Infants Home, Family Day Care · Chaya's Family Day Care · Little VIPs Child Care Haberfield · St John's Pre-school · Guardian Early Learning Centre · Goodstart Early Learning Centre · Nurjahan's Family Day Care · Greenwood Five Dock
		Local	Primary School	1	· Haberfield Public School
Leichhardt-Glebe	C4	Local	Childcare	7	· Explore and Develop · Emmerick Street Community Preschool · Billy Kids Lilyfield Early Learning Centre · Zero Up Childcare · OAC Leichhardt Elswick St Campus · My Stepping Stone · St Columba's North Leichhardt OSHC
		Local	Primary school	2	· St Columba's Primary School Leichhardt North · Orange Grove Public School
		District	Secondary College	1	· Sydney Secondary College Leichhardt

Precinct	Construction site	Provision	Facility types	No. of facilities	Name of facility
Alexandria-Erskineville	C5, C6 and C7	Local	Childcare	4	· Rosebud Cottage Childcare Centre · Lilyfield Early Learning Centre · Hilda Booler Kindergarten · Balmain Cove Early Learning Centre
		Regional	Tertiary Education	2	· Sydney Community College · TAFE NSW Petersham College, Annandale
	C8	Local	Childcare	4	· Rozelle Out of School Hours Care · St Thomas' Child Care Centre · Balmain Cove Early Learning Centre · Rozelle Child Care Centre
		Local	Primary school	1	· Rozelle Public School
		District	Secondary school	1	· Sydney Secondary College Balmain Campus
		Regional	Tertiary Education	1	· Sydney College of the Arts – The University of Sydney
	C9	Local	Childcare	10	· Camperdown Child Care Centre · Camperdown Sunshine Kids · Explore and Develop Camperdown · Guardian Early Learning Centre · Peekaboo - Camperdown (Learning Centre) · Annandale Child Care Centre · Sunshine Bubs Kindergarten · JoJo's Family Day Care · Explore & Develop Annandale · Lucas Street Child Care Centre
		Local	Primary school	2	· Annandale Public School · St Brendan's Primary School
		District	Special needs school	1	· Bridge Road School
		Regional	Tertiary	2	· Sydney Nursing School · The University of Sydney, Camperdown NSW
	C10	Local	Childcare	2	· St Peters Community Preschool · Tribe Out of School Hours
		Local	Primary school	1	· St Peters Public School

Source: Core List Australia 2016, Council Social Infrastructure Lists, Google and MapInfo GIS

5.2.2 Community facilities, libraries and places of worship

The study area contains a number of community centres, halls and places of worship for a variety of faiths. These facilities provide opportunities for increased community, cultural and social activities and interaction. In addition to this, community centres and halls presented within the study area play a role in:

- Delivering a range of educational, recreation and health services and programs
- Building community connections and relationships
- Improving the inclusion of community members especially within areas of highly diverse cultural and linguistic backgrounds.

At the time of undertaking the report, the study area contained around 30 community centres/halls, 140 places of worship and 10 libraries.

Table 5-49 provides a summary of the community centres, libraries and places of worship located within the study area.

Table 5-49 Community centres, libraries and places of worship in the study area

Precinct	Facility types	No. of facilities
Ashfield-Haberfield	Places of worship	58
	Community centres/hall	12
	Library	4
Leichhardt-Glebe	Places of worship	38
	Community centre/hall	11
	Library	4
Alexandria-Erskineville	Places of worship	47
	Community centres/hall	4
	Library	3

Table 5-50 provides a summary of the community centres, libraries and places of worship located within close proximity to the project footprint.

Table 5-50 Community centres, libraries and places of worship within close proximity to the construction ancillary facilities

Precinct	Construction site	Provision	Facility types	No. of facilities	Name of facility
Ashfield-Haberfield	C1a, C2a and C3a	Local	Place of worship	2	· Kingdom Hall of Jehovah's Witness · Anglican Church Sydney Diocese
Leichhardt-Glebe	C4	Local	Place of worship	2	· St Columba & the Holy Souls Catholic Church · St Gerasimos
		Local	Community centres	1	· Lucan Care Community Centre
	C5	Local	Place of worship	4	· St Joseph's Catholic Church
	C5, C6 and C7	Local	Community centres	1	· Lilyfield Community Centre
	C8	Local	Community centres	1	· Rozelle Neighbourhood Centre
		Local	Place of worship	1	· Darling Street Anglican Church

Precinct	Construction site	Provision	Facility types	No. of facilities	Name of facility
Alexandria-Erskineville	C9	Local	Community centres	3	· Booler Community Centre · C3 Central City Church · St Joseph's Catholic Church
	C10	Local	Place of worship	1	· St Peters Church

Source: Core List Australia 2016, Council Social Infrastructure Lists, Google and MapInfo GIS

5.2.3 Health and emergency facilities

The study area contains a range of health and emergency facilities servicing the local and wider community. These facilities include private and public hospitals, medical centres, general medical practices, fire, police and ambulance stations.

At the time of undertaking the report, the study area contained around 130 medical facilities and seven hospitals. Emergency services were also dispersed across the study area including police, ambulance and fire stations. There were around seven police stations, four ambulance stations and eight fire stations.

Table 5-51 provides a summary of the health and emergency facilities located within the study area.

Table 5-51 Identified health and emergency facilities in the study area

Precinct	Provision	Facility types	No. of facilities
Ashfield-Haberfield	Local	Medical centres (including general practitioners, collection centres and specialist medical)	58
	Regional	Hospitals	3
	District	Ambulance stations	1
	District	Fire stations	2
	District	Police stations	3
Leichhardt-Glebe	Local	Medical centres (including general practitioners, collection centres and specialist medical)	42
	Regional	Hospitals	2
	District	Ambulance stations	1
	District	Fire stations	3
	District	Police stations	2
Alexandria-Erskineville	Local	Medical centres (including general practitioners, collection centres and specialist medical)	35
	Regional	Hospitals	2
	District	Ambulance stations	2
	District	Fire stations	3
	District	Police stations	2

Source: Core List Australia 2016, Council Social Infrastructure Lists, Google and MapInfo GIS

Table 5-52 identifies the health and emergency facilities located within close proximity to the project footprint.

Table 5-52 Identified health and emergency facilities within close proximity of the construction ancillary facilities

Precinct	Construction site	Provision	Facility types	No. of facilities	Name of facility
Ashfield-Haberfield	C1a, C2a and C3a		None		
Leichhardt-Glebe	C4		None		
	C5, C6 and C7		None		
	C8	Local	Medical centre (including GP, collection centres and specialist medical)	2	· Rozelle Medical Centre · Rozelle Total Health
Alexandria-Erskineville	C9		Medical Centre, (including general practitioners, collection centres and specialist medical)	4	· Community Mental Health Centre Camperdown · Missenden Medical Centre · Southern Radiology Centre · Therapies for kids
	C10		None		

Source: Core List Australia 2016, Council Social Infrastructure Lists, Google and MapInfo GIS

5.2.4 Sport, recreation and leisure facilities

The study area contains a substantial amount of active and passive space in the form of parks, reserves, playgrounds, sporting fields, aquatic centres and bowling clubs. The area also benefits from cycling and walking paths located alongside waterfronts and other natural waterways. For the purpose of the audit facilities have been broken down into parks/reserves (passive spaces), playgrounds, sporting grounds/ovals (active spaces) and specialised sporting facilities. Specialised sporting facilities include facilities such as bowling clubs, tennis courts, golf courses, basketball courts, leisure and aquatic centres.

At the time of undertaking the report, there were about 150 parks/reserves located within the study area, 30 sporting grounds, three skate parks, 100 playgrounds and 40 specialised sports facilities. It should be noted that many of the playgrounds and sporting facilities were located within the identified parks and reserves. **Table 5-53** provides a summary of the sporting/recreational facilities within the study area precincts.

Table 5-53 Identified sporting/recreational facilities within study area

Precinct	Provision	Facility types	Number of facilities
Ashfield-Haberfield	Local	Park/reserves	59
	Local	Playgrounds	33
	District	Sporting grounds	8
	District	Specialised sports facilities	13
	District	Skate parks	3
Leichhardt-Glebe	Local	Park/reserves	48
	Local	Playgrounds	28
	District	Sporting grounds	9
	District	Specialised sports facilities (including courts)	14
Alexandria-	Local	Park/reserves	43

Precinct	Provision	Facility types	Number of facilities
Erskineville	Local	Playgrounds	45
	District	Sporting grounds	10
	District	Specialised sports facilities	12

Source: Core List Australia 2016, Council Social Infrastructure Lists, Google and MapInfo GIS

Table 5-54 identifies sport, recreation and leisure facilities are within close proximity to the project footprint.

Table 5-54 Sporting/recreational facilities within close proximity of the construction ancillary facilities

Precinct	Construction site	Provision	Facility types	No. of facilities	Name of facility
Ashfield-Haberfield	C1a, C2a and C3a	Local	Sports ground	1	· Hammond Park
	C1a, C2a and C3a	Local	Playgrounds	4	· Algie Playground · Livvi's Park Playground · Crocker Park Playground · Hammond Park Playground
		Local	Parks/reserves	4	· Croker Park · Wadim Jegorow Reserve · Reg Coady Reserve · Hammond Park · Algie Park
		District	Sports ground	1	· Timbrell Park
Leichhardt-Glebe	C4	Local	Playground	1	· Richard Murden Reserve Playground
					·
		Local	Sports ground	1	· Blackmore Park
		Local	Parks/reserves	1	· Richard Murden Reserve · Pioneers Memorial Park
	C5, C6 and C7	Local	Playground	1	· Easton Park Playground
		Local	Sports fields	1	· Easton Park
		Local	Parks/reserves	2	· Easton Park · Federal Park · Cohen Park · Buruwan Park · O'Connor Reserve
	C8	Local	Playground	2	· Shields Playground · Bridgewater Park Playground
		Local	Parks/reserves	1	· Bridgewater Park
		District	Parks/reserves	1	· King George Park · Callan Park
Alexandria-Erskineville	C9	Local	Playgrounds	2	· Camperdown Park Playground · O'Dea Reserve Playground
		Local	Parks/reserves	1	· Douglas Grant Memorial Park · O'Dea Reserve
		Local	Sports ground	1	· Camperdown Park
	C10	District	Sports ground	1	· Camdenville Park
		Local	Playground	1	· Sydney Park Playground
		Local	Parks/reserves	2	· Camdenville Park · Simpson Park
		Regional	Parks/reserves	1	· Sydney Park

Source: Core List Australia 2016, Council Social Infrastructure Lists, Google and MapInfo GIS

5.3 Employment centres

5.3.1 Strategic, district and local centres

In developing Towards our Greater Sydney 2056[22] (a draft update to A Plan For Growing Sydney), the Greater Sydney Commission (GSC) identified that some centres make a substantially greater contribution to the economy of Greater Sydney than others. On this basis, the draft District Plans have defined a hierarchy, which includes three types of centres: strategic, district and local. These centres vary in terms of scale and contribution to Greater Sydney's job growth and productivity as well as service provision to local communities.

Strategic centres

Strategic centres, including transport gateways, are locations that currently or are planned to have least 10,000 jobs and have the scale, industries and location needed to support Greater Sydney. These are priority locations for employment, retail, housing, services and mixed-uses and tend to have one or more of the following characteristics[23]:

- A higher proportion of knowledge-economy jobs, principally relating to the presence of major hospitals, tertiary education institutions, stand-alone office development or a combination of these
- The presence of existing or proposed major transport gateways
- A major role in supporting the increased economic activity of the eastern, central or western cities.

District centres

District centres including transport gateways, are locations that currently or are planned to have between 5,000 and 10,000 jobs. District centres have jobs, facilities and services that support district populations and tend to have one or more of the following characteristics[24]:

- The scale of retail activity, generally over 50,000 square metres of floor space
- The presence of health and education facilities that serve the district and the local community
- The level of transport services.

Local centres

Local centres vary in size from a few shops on a corner, to a vibrant main street. They are on a smaller scale than district centres and generally serve the local population[25].

5.3.2 Strategic and district centres

Strategic and district centres located within Greater Sydney, as identified in the draft District Plans, are illustrated on **Figure 5-1.**

[22] Greater Sydney Commission 2016, *Towards our Greater Sydney 2056*, NSW Government.

[23] Greater Sydney Commission 2016, *Draft Central District Plan*, NSW Government.

[24] Greater Sydney Commission 2016, *Draft Central District Plan*, NSW Government.

[25] Greater Sydney Commission 2016, *Draft Central District Plan*, NSW Government.

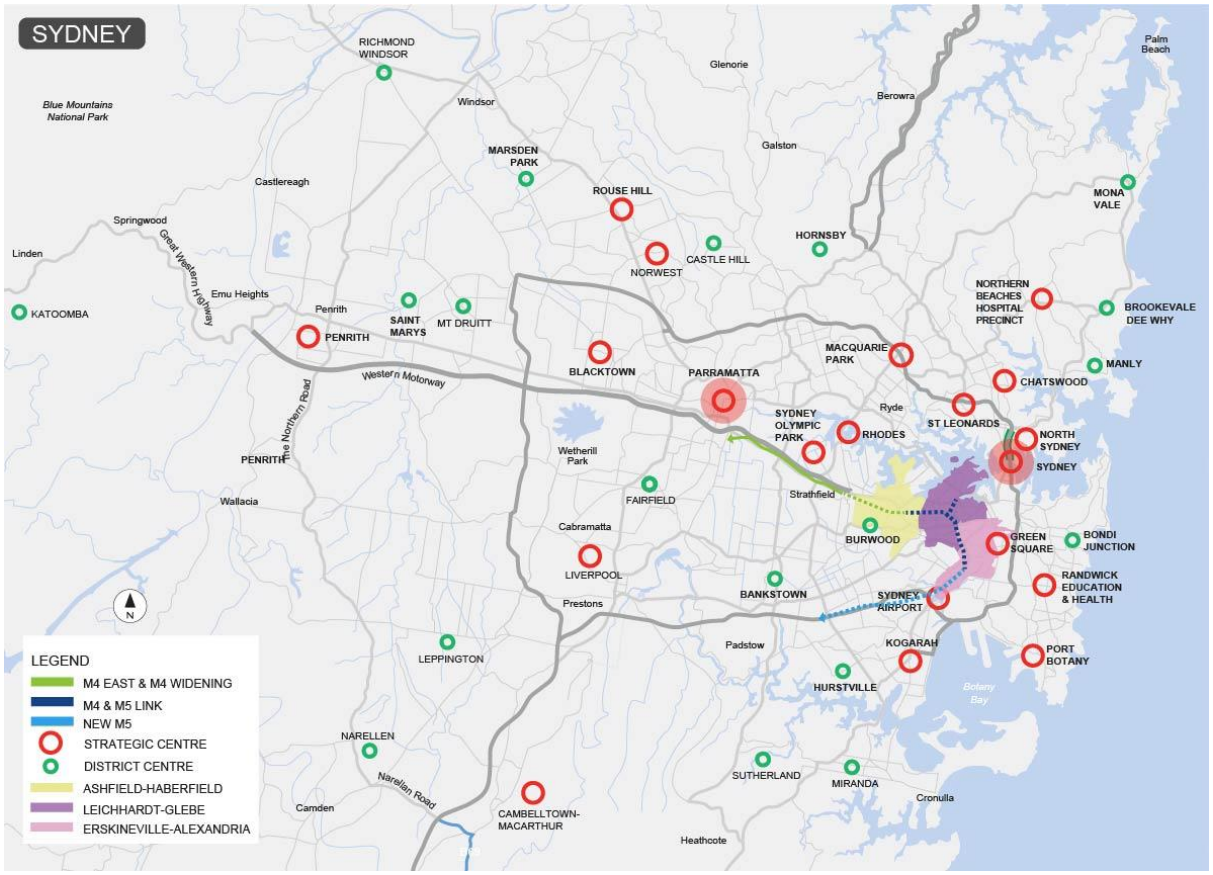


Figure 5-1 Strategic and district centres in Greater Sydney

Source: HillPDA 2017, adapted from information in the draft District Plans (indicative only)

The draft District Plans nominate job targets for the strategic and district centres to provide guidance to councils and State agencies as to the likely and potential scale of employment growth and to inform land use and infrastructure planning. **Table 5-5** outlines the employment projections identified for each strategic and district centre.

The baseline estimate job targets reflect the projected jobs growth that is anticipated in the centre. The higher estimate is an aspirational growth scenario to reflect outcomes in the case of further investment and land use planning in centres.

The targets reflect the crucial influence that transport has on making areas more attractive for businesses and more accessible to workers. As almost half of Greater Sydney's jobs are located in strategic and district centres, improving connections to these centres would have a significant impact on the socio-economic environment.

Table 5-55 Strategic and district centre employment numbers

Centre Type	District	Centre	2016 Job Estimate	2036 Job Baseline Estimate	2036 Higher Estimate
Strategic	Central	Sydney City	496,900	662,000	732,000
		Sydney Airport	18,100	22,000	24,500
		Green Square-Mascot	59,500	75,000	80,000
		Randwick Health & Education	22,800	32,000	35,500
		Port Botany	14,900	17,000	18,500
		Rhodes	15,700	22,000	25,500
	West Central	Greater Parramatta City Westmead	96,500	156,000	170,500
		Sydney Olympic Park	30,100	45,000	46,500
		Norwest	32,400	49,000	53,000
		Blacktown	13,200	17,000	19,500
	North	Macquarie Park	58,500	73,000	79,000
		North Sydney	60,400	76,000	81,500
		St Leonards	47,100	54,000	63,500
		Chatswood	24,700	31,000	33,000
		Northern Beaches Hospital and surrounding industrial areas	9,300	12,000	1,300
	West	Greater Penrith	33,400	44,000	45,000
	South West	Liverpool	29,000	36,000	39,000
		Campbelltown-Macarthur	20,400	27,000	31,000
	South	Kogarah	11,800	16,000	20,500
District	Central	Bondi Junction	13,800	17,000	20,500
		Burwood	10,300	12,000	14,000
		Eastgardens-Maroubra Junction	6,900	8,000	9,000
	West Central	Castle Hill	9,800	16,000	19,500
		Rouse Hill	4,200	10,000	11,000
		Mount Druitt	6,700	8,000	8,500
		Marsden Park	300	5,000	8,500
	North	Brookvale-Dee Why	20000	23,000	26,000
		Hornsby	14300	18,000	22,000
		Manly	5,000	6,000	6,500
		Mona Vale	4,300	5,000	6,000
	West	St Marys	8,300	10,000	11,500
		Richmond-Windsor	10,300	12,000	16,500
		Katoomba	2,700	3,000	5,500
	South West	Fairfield	5,400	6,000	10,000
		Narellan	10,600	14,000	16,500
		Leppington	400	7,000	12,500
	South	Bankstown Airport	15,000	17,000	20,000
		Bankstown	12,100	17,000	25,000
		Hurstville	11,600	1,500	20,000
		Miranda	7,000	8,000	11,500
		Sutherland	5,700	8,000	9,000
		Campsie	4,800	7,000	7,500

Source: HillPDA 2017, adapted from information in the draft District Plans

5.3.3 Local centres

Figure 5-2 illustrates the local centres located within the study area. The local centres within the study area are generally clustered on the main transport routes (such as bus routes) and provide either a specialist service to the broader area or a convenience service for the local community. Rozelle Local Centre (as defined in the draft District Plan) is the only local centre within close proximity to the project footprint. The business clusters that contribute to this local centre are Darling Street and Victoria Road. Specific detail of these clusters are described in the section below.

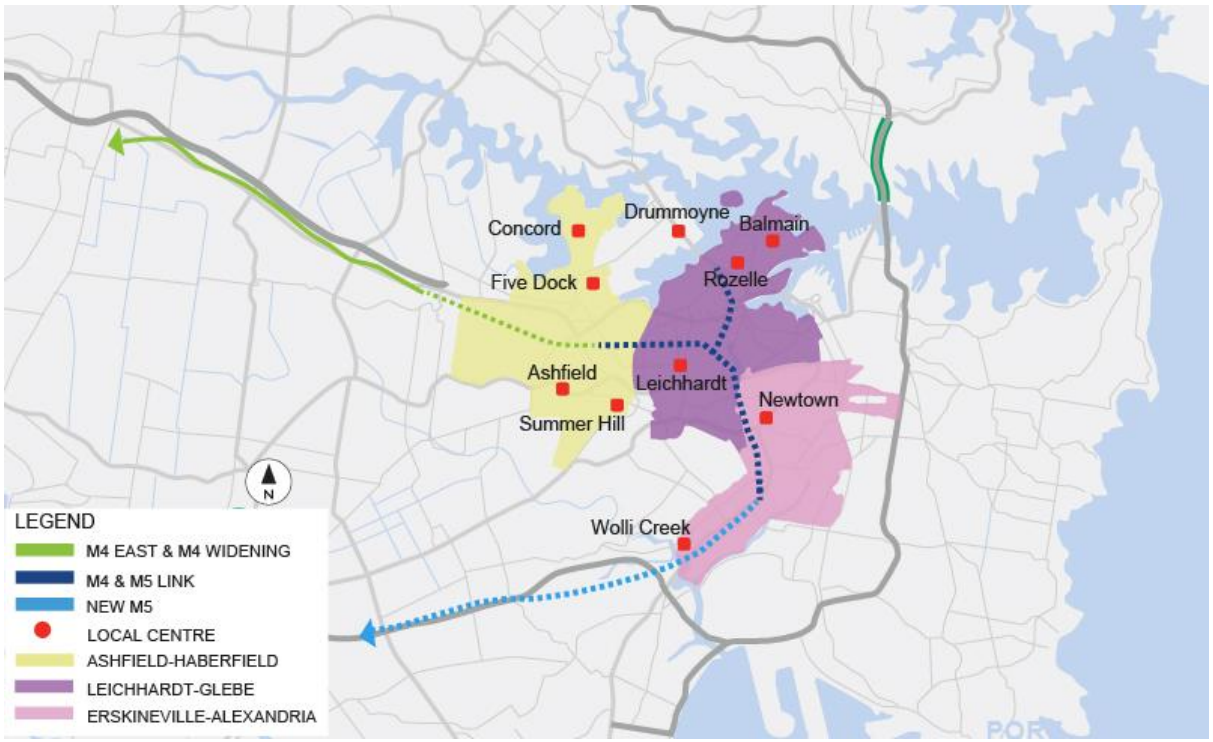


Figure 5-2: Local centres within the study area

Source: HillPDA 2017, adapted from information in the draft Central District Plans (indicative only)

Business clusters

Although not necessarily confined within a Local Centre, a number of business uses are dispersed across the study area forming business clusters. These business clusters range in size and provision and have been described below.

Ashfield-Haberfield

The following business and industry clusters are located within close proximity to the project footprint within the Ashfield-Haberfield precinct.

Figure 5-3 Business and industry clusters within close proximity of the construction ancillary facilities C1a, C2a & C3a at Haberfield (Option A)

Table 5-56 Description of business clusters within close proximity of the construction ancillary facilities C1a, C2a and C3a at Haberfield (Option A)

Project area	Business cluster name	Business land zoning	Business cluster description
Wattle Street civil and tunnel site (C1a) Haberfield civil and tunnel site (C2a) Northcote Street civil site (C3a)	Parramatta Road Haberfield	B6 Enterprise Corridor	Parramatta Road at Haberfield is a linear specialist retail centre generally containing car dealerships, smash repairers and home building and renovation suppliers. These business types are destination (purpose visit) retailers and are not reliant on passing trade. Service stations and take-away food businesses are also located along the road. These businesses would be more reliant on drop in customers and passing trade, however would not be dependent on pleasant amenity to attract customers. A large Bunnings is an anchor tenant along the road and would attract higher volumes of customers. The cluster would serve a wide catchment.

Project area	Business cluster name	Business land zoning	Business cluster description
Wattle Street civil and tunnel site (C1a) Northcote Street civil site (C3a)	Ramsay Road Convenience	B1 Neighbourhood Centre	Ramsay Road Convenience is a small commercial centre on the intersection of Harrabrook Avenue, Ramsay Road and Connecticut Avenue. The centre contains a mix of passive and active uses including a restaurant, veterinary hospital, mechanic, catering company, hair salon and a shutter and blinds company. The majority of the cluster would not be as dependent on passing trade and would primarily service the local community.
Wattle Street civil and tunnel site (C1a) Haberfield civil and tunnel site (C2a)	Ramsay Street Convenience	B1 Neighbour-hood Centre	Ramsay Street is a small commercial business cluster on the corner of Ramsay Street and Alt Street. The cluster contains primarily commercial office and wholesale retail space. One restaurant operates out of the corner store and would be more dependent on pleasant amenity. The cluster would not be as dependent on passing trade and would service the local community.

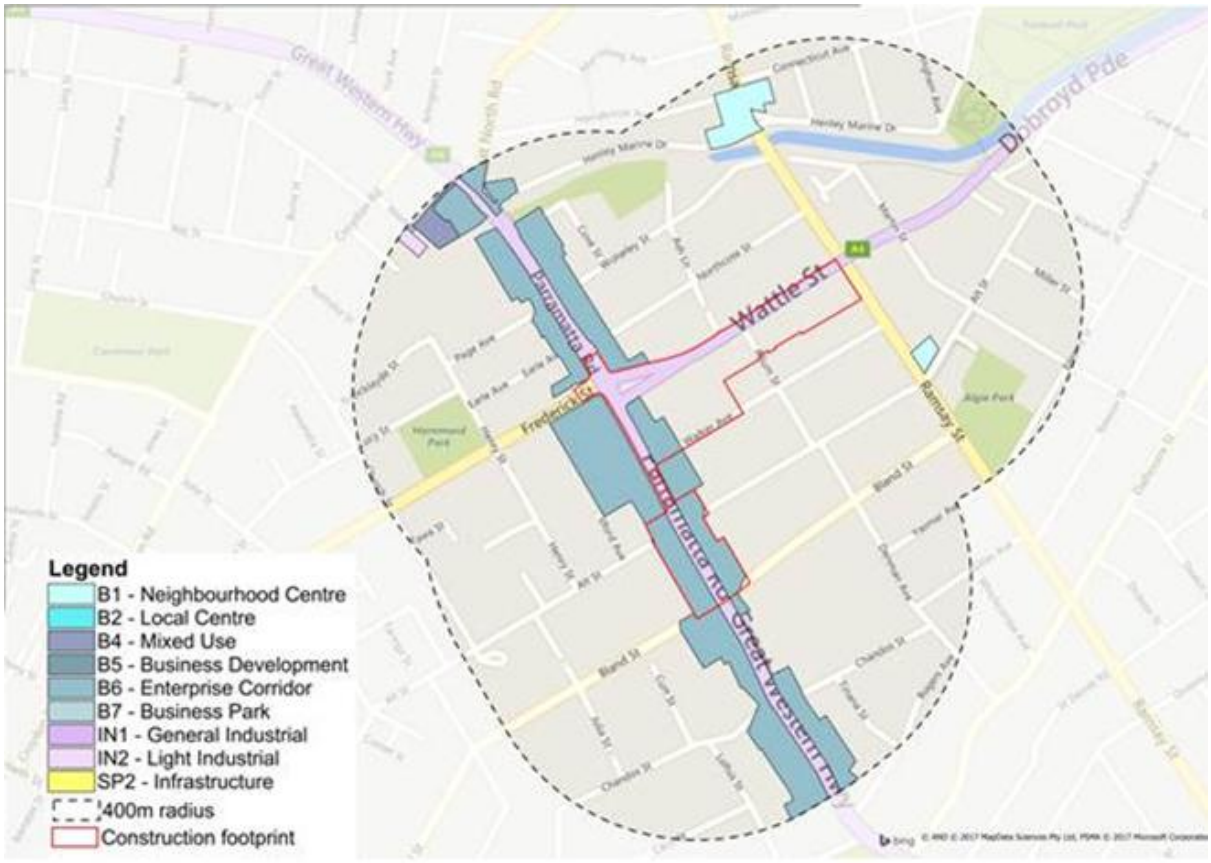


Figure 5-4 Business and industry clusters within close proximity of construction ancillary facilities C1b, C2b and C3b at Haberfield (Option B)

Table 5-57 Description of business clusters within close proximity of construction ancillary facilities C1b, C2b and C3b at Haberfield (Option B)

Ancillary facility	Business cluster name	Business land zoning	Business cluster description
Parramatta Road West civil and tunnel site (C1b) Haberfield civil site (C2b) Parramatta Road East civil site (C3b)	Parramatta Road Haberfield	B6 Enterprise Corridor	Parramatta Road at Haberfield is a linear specialist retail centre generally containing car dealerships, smash repairers and home building and renovation suppliers. These business types are destination (purpose visit) retailers and are not reliant on passing trade. Service stations and take-away food businesses are also located along the road. These businesses would be more reliant on drop in customers and passing trade, however would not be dependent on pleasant amenity to attract customers. A large Bunnings is an anchor tenant along the road and would attract higher volumes of customers. The cluster would serve a district catchment.
Haberfield civil site (C2b)	Ramsay Street Convenience	B1 Neighbourhood Centre	Ramsay Street is a small commercial business cluster on the corner of Ramsay Street and Alt Street. The cluster contains primarily commercial office and wholesale retail space. One restaurant operates out of the corner store and would be more dependent on pleasant amenity. The cluster would not be dependent on passing trade and would service the local community.

Leichhardt-Glebe

The following business and industry clusters are located within close proximity to the project footprint within the Leichhardt-Glebe precinct.

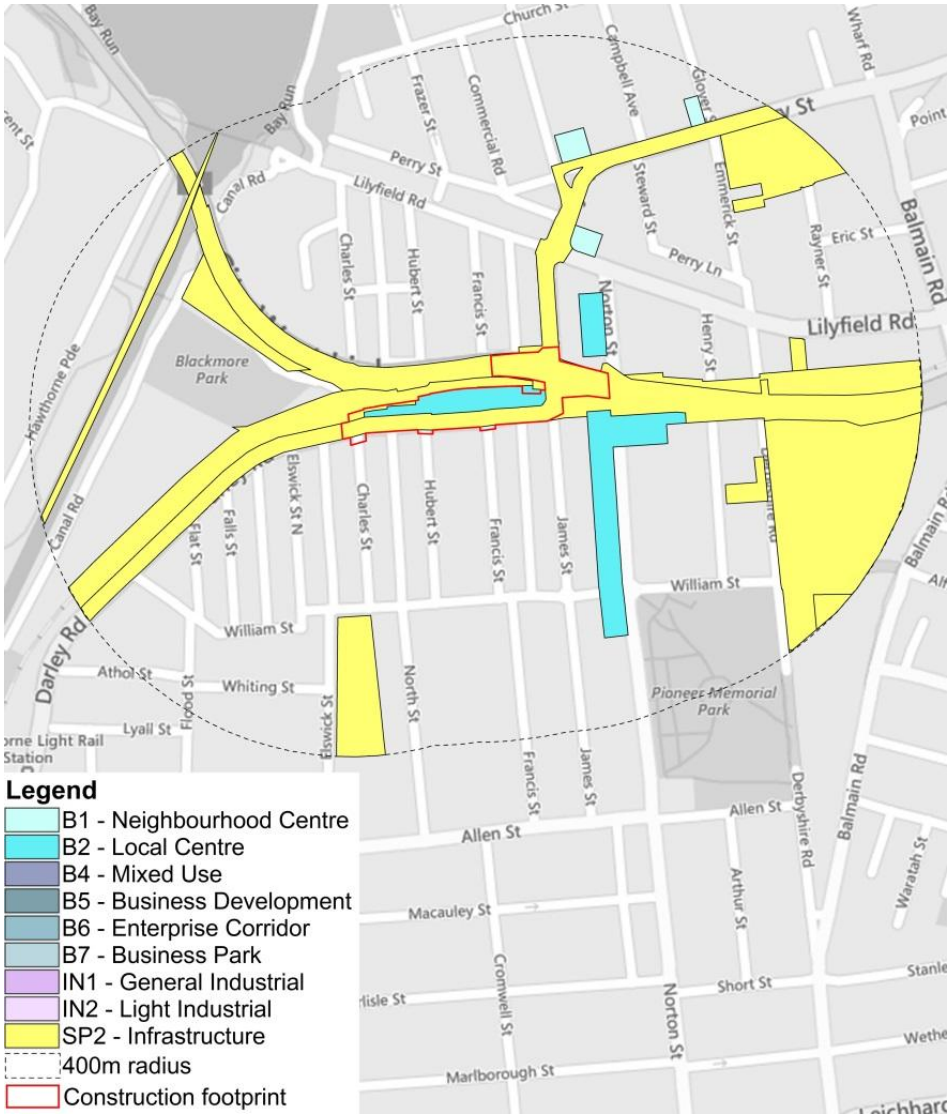


Figure 5-5 Business and industry clusters within close proximity of the Darley Road civil and tunnel site (C4)

Table 5-58 Description of business clusters within close proximity of the Darley Road civil and tunnel site (C4)

Ancillary facility	Business cluster name	Business land zoning	Centre description
Darley Road civil and tunnel site (C4)	Canal Road	SP1 Special activities: Canal Road arts precinct	A cluster of specialised creative arts businesses is located in the cluster on Canal Road, adjoining Blackmore Park. The business mix includes prop suppliers, film services, wig making and a costume rental service. The cluster services a wide catchment and is unlikely to be dependent on passing trade.

Ancillary facility	Business cluster name	Business land zoning	Centre description
	Norton Street	B2 Local centre	The Norton Street cluster contains a mix of speciality retail and personal service businesses. A mix of convenience stores, speciality clothing, homewares and beauty salons are dispersed along the street. A number of restaurants and cafés are also present. Automotive repair garages and building supply retailers are located towards City West Link end. The business cluster primarily contains passive uses, however some businesses would benefit from passing trade. The cluster caters primarily to a neighbourhood catchment.
	Lilyfield Neighbourhood	B1 Neighbourhood Centre B2 Local Centre	There are a number of small and dispersed commercial uses north of the construction site on Perry Street, Lilyfield Road and Norton Street. These uses are predominantly neighbourhood convenience shops and cafés or small speciality businesses and retail. These businesses would primarily serve a neighbourhood catchment and are likely to rely on passing trade.

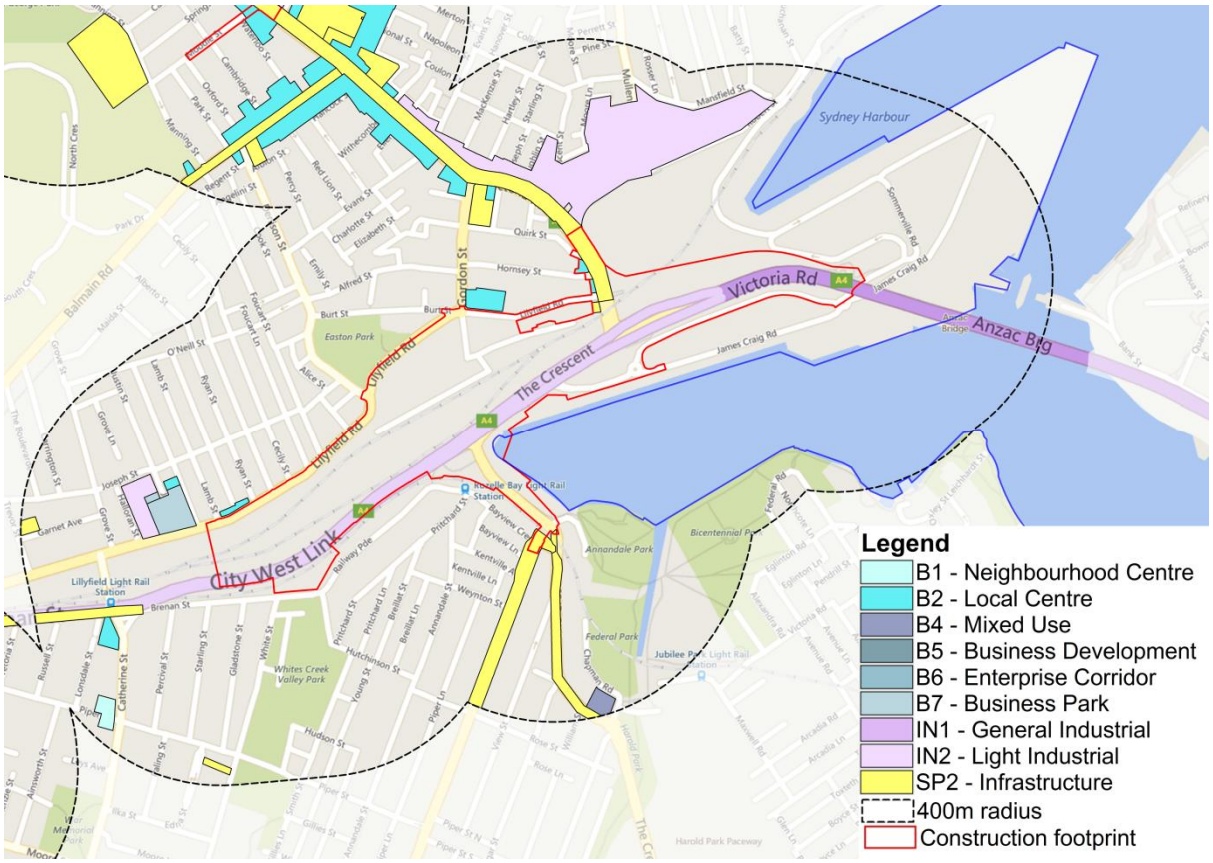


Figure 5-6 Business and industry clusters within close proximity of construction ancillary facilities C5, C6 and C7 Rozelle

Table 5-59 Description of business clusters within close proximity of construction ancillary facilities C5, C6 and C7 - Rozelle

Ancillary facility	Business cluster name	Business land zoning	Business cluster description
Rozelle civil and tunnel site (C5) The Crescent civil site (C6) Victoria Road civil site (C7)	Catherine Street Convenience	B2 Local Centre	Catherine Street, Lilyfield contains two small business centres. A larger convenience store is located on the corner of City West Link and operates as the anchor tenant. A small mixed use retail centre is present, containing a newsagency, health and beauty, jeweller, café and a grocer. These businesses cater to a neighbourhood catchment and are likely to be reliant on passing trade.
	Lilyfield Road	B1 Neighbourhood Centre B2 Local Centre	Lilyfield Road contains two small business clusters both containing passive commercial office and wholesale retail uses. The businesses would likely serve a broader specialised catchment and are unlikely to be dependent on passing trade.
	Roberts Street	IN2 Light Industry	The business uses along Robert Street, Rozelle (Victoria Road end) mostly include passive services such as mechanics, auto body repair shops and light industry manufacturing and trade. Robert Street would be considered a destination services area as many customers would be driving specifically to the business. The businesses would service both a neighbourhood and wider catchment and are unlikely to be dependent on passing trade.
	James Craig Road	Unincorporated Sydney Foreshore Authority	James Craig Road, Rozelle is a working waterfront area with businesses being predominantly marine related, such as dry storage, slipways, harbour cruises, government agency (Maritime NSW), public marina berths as well as supportive food services such as cafés. The working waterfront would be dependent on access and connectivity, servicing a wide catchment. The business clusters are unlikely to be dependent on passing trade.
	Chapman Road	B4 Mixed Use	Two large specialist retail providers are located in the cluster. The businesses would service a wide catchment and are unlikely to be dependent on passing trade.
	Victoria Road	B2 Local Centre and IN20 Industrial Light Industry	Victoria Road, Rozelle contains a mix of active and passive business uses. An industrial precinct is located in the southern section of Victoria Road, which contains a number of urban support services and warehousing businesses. Heading northward along Victoria Road there are number commercial, retail and medical businesses leading to Darling Street. The businesses would service both a neighbourhood and wider catchment and are more likely to be dependent on passing trade.

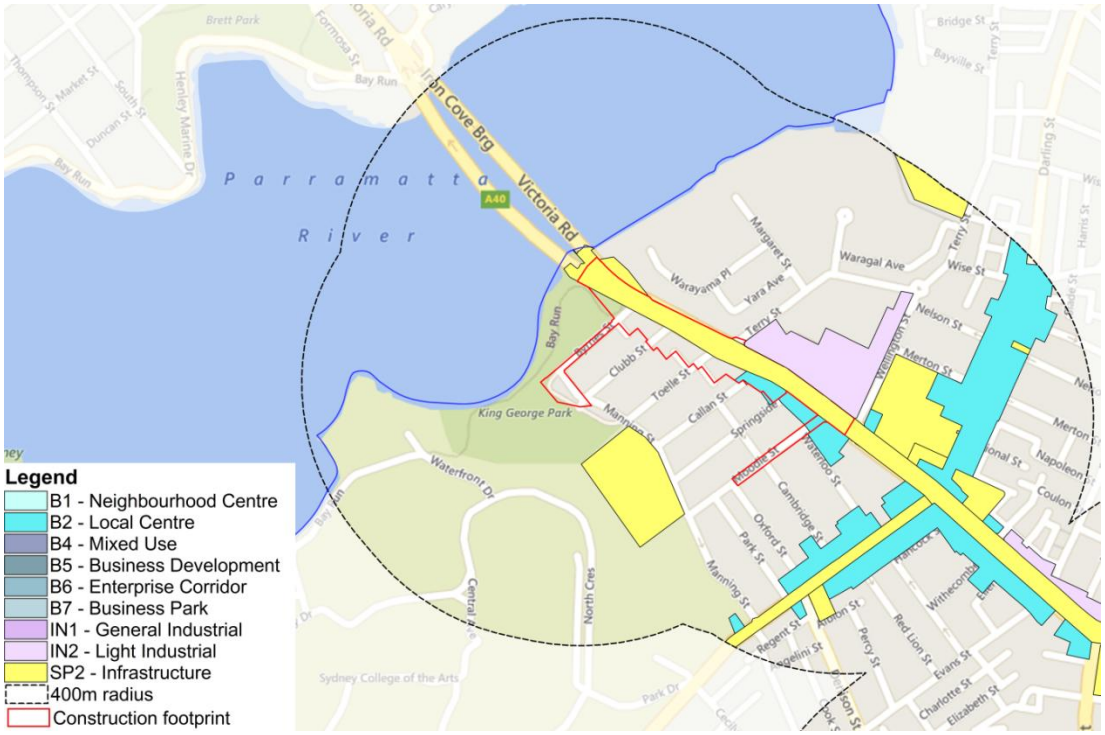


Figure 5-7 Business and industry clusters within close proximity of the Iron Cove Link civil site (C8)

Table 5-60 Description of business clusters within close proximity of the Iron Cove Link civil site (C8)

Ancillary facility	Business cluster name	Business land zoning	Business cluster description
Iron Cove Link civil site (C8)	Victoria Road	B2 Local Centre	Victoria Road, Rozelle contains a mix of active and passive business uses. The Iron Cove Bridge end of the cluster contains a mix of businesses including pubs, service stations and auto repair shops. The businesses in close proximity to the Darling Street intersection contain a variety of retail and personal medical services. These businesses generally offer specialised services or products that customers would travel to specifically. The businesses would serve a wide catchment and although they are heavily dependent on business visibility, they would be less dependent on passing trade.
	Darling Street	B2 Local Centre	Darling Street, Rozelle is oriented towards food services such as cafés, restaurants and takeaway shops. There is also a mix of personal retailing such as clothing stores, hairdressers, bike shops and a small contingent of commercial services (banks and post offices) and health services (gyms and medical centre). Darling Street is an active centre that would rely on passing trade and would service both a neighbourhood and wider catchment.
	Crystal Street	IN2 Light Industrial	Crystal Street is zoned industrial and reflects a precinct that is transitioning from that of a traditional industrial to a residential precinct. Businesses in this cluster are unlikely to be dependent on passing trade and would serve a wider catchment.

Alexandria-Erskineville

The following business and industry clusters are located within close proximity to the project footprint within the Alexandria-Erskineville precinct.

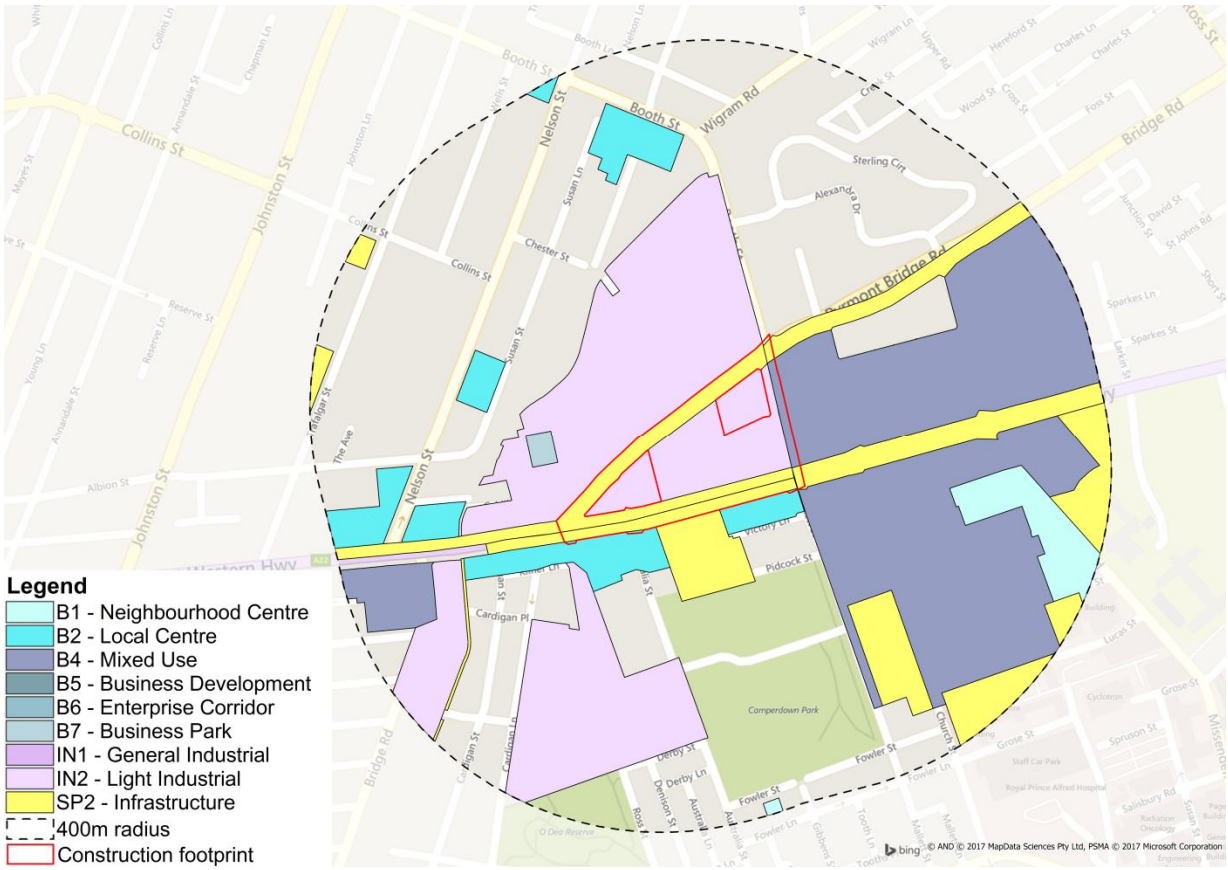


Figure 5-8 Business and industry clusters within close proximity of the Pyrmont Bridge Road tunnel site (C9)

Table 5-61 Description of business clusters within close proximity of the Pyrmont Bridge Road tunnel site (C9)

Ancillary facility	Business cluster name	Business land zoning	Business cluster description
Pyrmont Bridge Road tunnel site (C9)	Annandale-Camperdown	B1 Neighbourhood Centre B2 Local Centre B4 Mixed Use B7 Business Park IN2 Light Industrial	A diverse mix of uses are located is the Annandale-Camperdown business cluster. Light industrial uses including warehouse and storage facilities, commercial operators, large format specialised retailers, personal service providers and food and beverage businesses are oriented to the north of Pyrmont Bridge Road. Along Parramatta Road there is a mix of food and speciality retail services. A number of serviced apartments, hotels and student accommodation are located to the east and south-east of the site in the B4 mixed use area. Specialised retail, personal service operators, café and restaurant providers and small business operators are located along the Missenden Road frontage. The Annandale-Camperdown business cluster would rely on passing trade and would service both a neighbourhood and wider catchment.

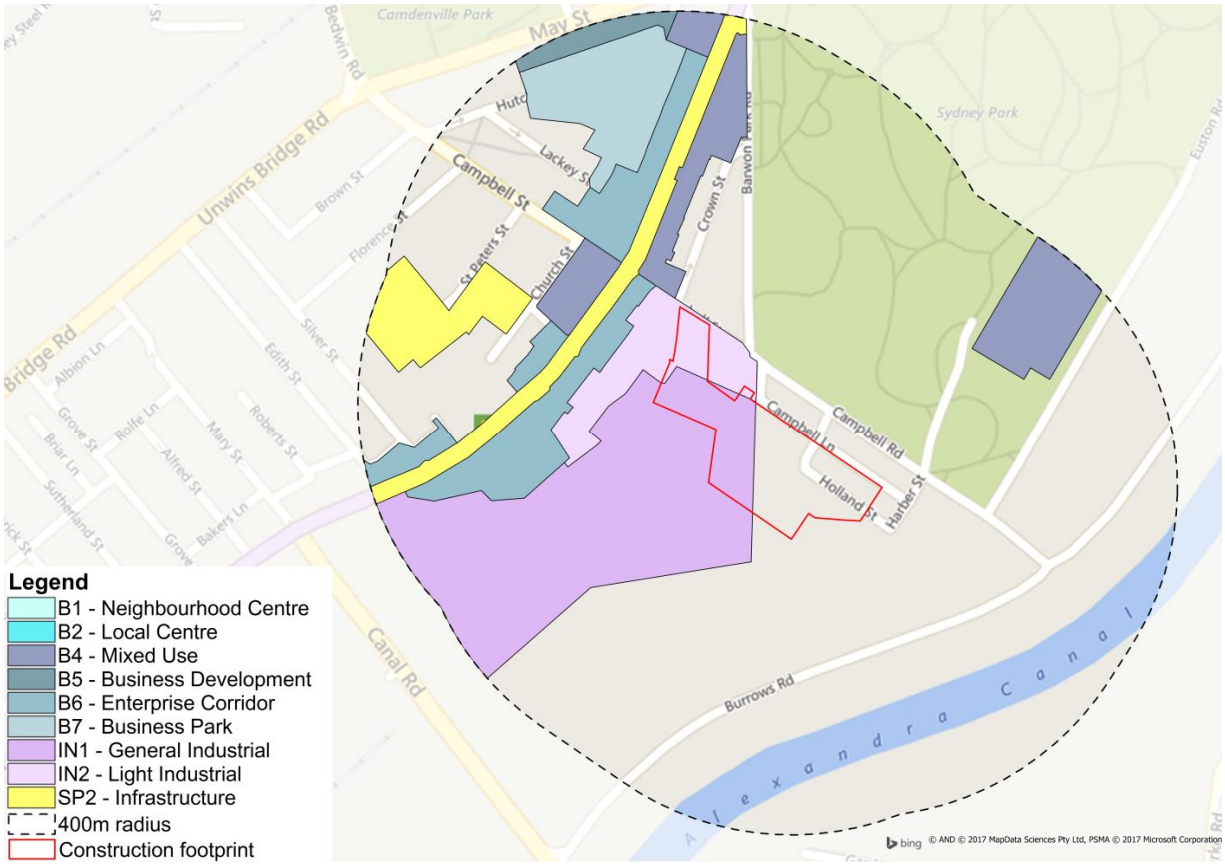


Figure 5-9 Business and industry clusters within close proximity of the Campbell Road civil and tunnel site (C10)

Table 5-62 Description of business clusters within close proximity of the Campbell Road civil and tunnel site (C10)

Ancillary facility	Business cluster name	Business land zoning	Centre description
Campbell Road civil and tunnel site (C10)	Princes Highway	B4 Mixed Use B6 Enterprise Corridor B7 Business Park IN2 Light Industrial	A mix of takeaway food services such as KFC and McDonald's front the Princes Highway. A business park is located to the west of the construction site, containing office and warehousing space for a variety of businesses. Domestic building and interior supply businesses are dominant in the area. The B6 Enterprise Corridor zoning along the Princes Highway, allows for the clustering of commercial, retail, bulky goods, wholesaling, urban support and industrial businesses. There are also hospitality services present such as the IBIS budget hotel and fast food restaurants linked to the operation of Sydney Airport. Campbell Road itself contains limited business uses, with the majority of the land being utilised by WestConnex. This centre is unlikely to be dependent on passing trade or pleasant amenity.
	Burrows Road Industrial	IN1 General Industrial	This centre contains a variety of heavy industrial uses, manufacturers, office, wholesalers, specialised services and trades and food and beverage providers. This centre is unlikely to be dependent on passing trade or pleasant amenity.
	Euston Road	B4 Mixed Use	The cluster contains an office business park that would provide employment for the broader district. This centre is unlikely to be dependent on passing trade.

5.4 Businesses within the study area

Table 5-63 highlights the total number of businesses located within the study area as of June 2016[26]. Alexandria-Erskineville contains the largest number of businesses out of the three precincts in the study area.

Table 5-63 Total number of businesses

Precinct	Total number of businesses
Ashfield-Haberfield	9,029
Leichhardt-Glebe	9,136
Alexandria-Erskineville	10,611
Total	28,776

Source: ABS, 2016; HillPDA calculations

[26] ABS. '8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2012 to Jun 2016, Table 1, Businesses by Industry Division by Statistical Area Level 2 by Employment Size Ranges, June 2016 '.

As identified in **Table 5-64**, in June 2016, there were around 11,670 employed people in the study area. Across the study area, all precincts have a high number of businesses with fewer than 20 employees and non-employing businesses (ie independent contractors, sole proprietorships or professional partnerships who would not hire additional employees). This is likely to be attributable to the larger proportion of construction and professional services businesses in the precinct that would not require additional back office staff (eg independent contractors or professional partnerships who manage their own businesses).

At around 4,500 the Alexandria-Erskineville provides the largest employment figures. This precinct also includes the largest number of businesses employing more than 200 employees.

Table 5-64 Total number of employing businesses

Precinct	Employees					
	Total (non-employing)	1–4	5–19	20–199	200+	Total (employing)
Ashfield-Haberfield	5,517	2,725	647	131	9	3,512
Leichhardt-Glebe	5,494	2,717	753	166	6	3,642
Alexandria-Erskineville	6,096	2,960	1,103	434	18	4,515
Total	17,107	8,402	2,503	731	33	11,669

Source: ABS, 2016; HillPDA calculations

5.4.1 Industry value added and employment

The metric of 'Industry Value Added' (IVA) refers to the total value of goods and services produced by an industry, minus the cost of goods and services used in the production process. IVA is a more refined measure of economic contribution than gross output as some industries have higher levels of output but require large amounts of input expenditure to achieve that (eg mining versus retail sales)[27].

Small area estimates of IVA (eg at the SA2 level) are not routinely provided by the ABS as part of their standard release. As a result, to estimate local economic activity HillPDA divided total Statewide IVA by the Statewide number of employees to derive an average IVA per employee. HillPDA then multiplied average IVA per employee by the most recent industry employment estimates within the study area (making any necessary adjustments for inflation as required).

Using this approach, the study area as a whole was found to generate around $9.7 billion[28] of IVA per year. Comparatively, in June 2016 Greater Sydney IVA was around $284.5 billion and NSW Gross State Product (GSP) was around $538.5 billion[29]. At two per cent the study area contributes to a relatively small fraction of GSP.

HillPDA estimates that employment industries within the IVA for each of the three precincts within the study area were as follows[30]:

- Ashfield-Haberfield precinct – contributed an estimated $950 million IVA with the largest contributing industry being health care and social assistance, contributing 18 per cent of the precincts total IVA and 10 per cent of the study areas IVA
- Leichhardt-Glebe precinct – contributed an estimated $2,690 million IVA with the largest contributing industry being professional, scientific and technical services, contributing 14 per cent of the precincts total IVA and 28 per cent of the study areas IVA

[27] IVA also excludes taxes less subsidies. We have also excluded ownership of dwellings, which consists of property owners and owner-occupiers of dwellings. Ownership of dwellings is often excluded for this purpose land-use and industry analysis.
[28] Indexed to $2016.

[29] ABS. '5220.0 Australian National Accounts: State Accounts, Series A2478800F'.

[30] HillPDA calculation based on per capita information from the ABS, '5220.0 Australian National Accounts: State Accounts, Series A2478800F'.

- Alexandria-Erskineville precinct – contributed an estimated $6,040 million IVA with the largest contributing industry being information media and telecommunications, contributing 13 per cent of the precincts total IVA and 62 per cent of the study areas IVA.

Table 5-65 summarises HillPDA's estimates of IVA by industry sector. Across the study area, the top three industries by IVA were health care and social assistance, professional, scientific and technical services and information media and telecommunications, which represent 10.8 per cent, 10.6 per cent and 10.4 per cent of IVA respectively.

Table 5-65 Industry value added by industry sector ($000, rounded)

Description	Ashfield-Haberfield IVA ($000)	Leichhardt-Glebe IVA ($000)	Alexandria-Erskineville IVA ($000)	Total IVA ($000)	% of study area total
Agriculture, forestry and fishing	1,000	3,900	1,600	6,500	0.1%
Mining	-	1,100	9,300	10,400	0.1%
Manufacturing	29,600	164,600	641,800	836,000	8.6%
Electricity, gas, water and waste services	7,300	9,600	56,800	73,700	0.8%
Construction	46,900	168,700	210,300	425,900	4.4%
Wholesale trade	28,700	152,600	590,000	771,300	8.0%
Retail trade	76,700	198,500	217,500	492,700	5.1%
Accommodation and food services	38,800	110,700	137,500	287,000	3.0%
Transport, postal and warehousing	19,300	71,700	652,500	743,500	7.7%
Information media and telecommunications	18,100	235,600	757,700	1,011,400	10.4%
Financial and insurance services	44,000	135,000	150,300	329,300	3.4%
Rental, hiring and real estate services	125,400	123,200	143,300	391,900	4.0%
Professional, scientific and technical services	73,400	374,500	574,500	1,022,400	10.6%
Administrative and support services	33,800	174,500	170,200	378,500	3.9%
Public administration and safety	127,200	175,000	334,500	636,700	6.6%
Education and training	80,700	182,100	581,400	844,200	8.7%
Health care and social assistance	173,800	280,800	593,100	1,047,700	10.8%
Arts and recreation services	8,300	40,900	75,900	125,100	1.3%
Other services	21,800	83,200	141,700	246,700	2.5%
Total	950,000	2,690,000	6,040,000	9,680,000	100%

Source: ABS, 2016; HillPDA calculations

At a precinct level, within Leichhardt-Glebe, health care and social assistance and professional, scientific and technical services were the two largest generators of economic value (about 24.3 per cent together), likely reflecting the presence of the Royal Prince Alfred hospital and the University of Sydney.

In Ashfield-Haberfield, health care and social assistance, public administration and safety and rental, hiring and real estate services were the largest contributors to IVA. This potentially reflects the presence of two hospitals (Sydney Private Hospital and Wesley Hospital) and NSW Government offices, such as Family and Community Services and Housing NSW.

Within the Alexandria-Erskineville precinct, transport, postal and warehousing and information media and telecommunications are the two largest industries. However, looking at the employment figures in **Table 5-66**, retail trade represents a much larger proportion of jobs across Alexandria-Erskineville despite having a lower IVA, reflecting the relatively lower economic contribution per job. On both an IVA and employment perspective, education and training, health care, and social assistance reflect important contributions to the study area, together representing 25.5 per cent of jobs and 19.5 per cent of IVA.

Table 5-66 Precinct employment by industry sector

Description	Ashfield-Haberfield	Leichhardt-Glebe	Erskineville-Alexandria	Total jobs	% of total
Agriculture, forestry and fishing	11	43	18	72	0.1%
Mining	-	3	25	28	0.0%
Manufacturing	220	1,223	4,769	6,212	6.8%
Electricity, gas, water and waste services	23	30	178	231	0.3%
Construction	497	1,788	2,229	4,514	5.0%
Wholesale trade	185	985	3,808	4,978	5.5%
Retail trade	1,489	3,854	4,224	9,567	10.5%
Accommodation and food services	771	2,201	2,735	5,707	6.3%
Transport, postal and warehousing	170	633	5,759	6,562	7.2%
Information media and telecommunications	76	987	3,175	4,238	4.7%
Financial and insurance services	153	470	523	1,146	1.3%
Rental, hiring and real estate services	628	617	718	1,963	2.2%
Professional, scientific and technical services	619	3,157	4,843	8,619	9.5%
Administrative and support services	232	1,198	1,169	2,599	2.9%
Public administration and safety	1,097	1,509	2,885	5,491	6.0%
Education and training	999	2,255	7,199	10,453	11.5%
Health care and social assistance	2,115	3,417	7,217	12,749	14.0%
Arts and recreation services	120	589	1,094	1,803	2.0%
Other services	349	1,331	2,268	3,948	4.3%
Total	9,754	26,290	54,836	90,880	100%

Source: Bureau of Transport Statistics, "Journey to Work Survey: Table 17 Origin SA2 by Destination SA2 by Mode 15

5.5 Transport and access

Sydney's population is increasing with infill development and urban renewal projects contributing to inner-city growth. Balancing the needs of passenger vehicles, public transport and freight movement is a key challenge in planning for future transport infrastructure.

Changes to road, public transport and/or active transport networks during construction have the potential to result in impacts on access and connectivity for residents, business owners and visitors. As access and connectivity are major components of the socio-economic assessment, it is important

to consider the baseline transport infrastructure present within the study area. The existing baseline condition is presented below and has largely been drawn from **Appendix H** (Technical working paper: Traffic and transport) of the EIS, which provides a detailed analysis of the existing transport and traffic environment.

5.5.1 Passenger vehicles and public transport

Parramatta Road, Victoria Road, City West Link and King Street/Princes Highway are all major arterial roads that provide access between the city and the west, south-west and north-west. These routes dissect the urban environment carrying significant volumes of traffic daily.

Roads and Maritime has a number of traffic counters and classifiers in place across the NSW road network. **Figure 5-10** illustrates the location of traffic counters with the correlating information highlighted in **Table 5-67**. The information highlights the traffic volumes on major road networks relevant to the project. These roads are more likely to experience changes in traffic volumes during construction and upon operation of the project.

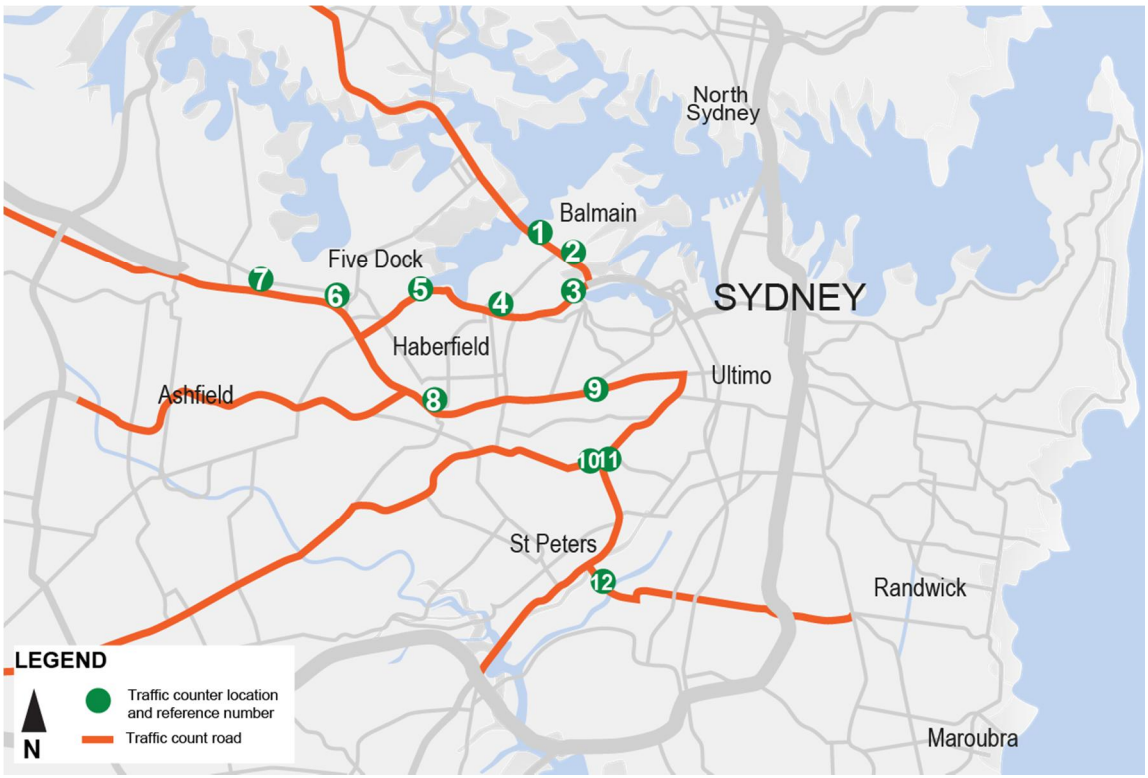


Figure 5-10 Traffic counter locations as relevant to the M4-M5 Link project

Source: HillPDA 2016 and Traffic Volume Viewer 2016

Table 5-67 All vehicle average daily traffic count 2016

Figure 5-10 ref.	Traffic counter locations	North-bound	South-bound	East-bound	West-bound	Classifier
1	**Victoria Road** (at Byrnes Street, Rozelle)				35,710	N/A
2	**Victoria Road** (at Evans Street, Rozelle)			32,866		Light vehicle: 95% Heavy vehicle: 5%
3	**City-West Link Road** (at The Crescent)			25,195	22,015	N/A
4	**City-West Link Road** (at James Street, Lilyfield)				27,214	Light vehicle: 94% Heavy vehicle: 6%
5	**City-West Link Road** (at Timbrell Drive, Haberfield)				25,962	Light vehicle: 93% Heavy vehicle: 7%
6	**Parramatta Road** (at Arlington Street, Five Dock)			39,801		Light vehicle: 91% Heavy vehicle: 9%
7	**Parramatta Road** (at Cheltenham Road, Five Dock)			36,856	37,547	N/A
8	**Parramatta Road** (at Brown Street, Leichhardt)			31,696	30,827	N/A
9	**Parramatta Road** (at Mathieson Street, Annandale)			29,647	21,249	N/A
10	**Enmore Road** (at Bailey Street, Newtown)	14,626	13,334			N/A
11	**King Street** (at Newman Street, Newtown)	10,540	10,274			N/A
12	**Canal Road** (north of Burrows Road, St Peters)			13,304	14,773	Light vehicle: 88% Heavy vehicle:12%

Source: Roads and Maritime, Traffic Volume Viewer 2016

As can be seen in **Table 5-67**, Parramatta Road currently carries the largest volume of daily traffic, with up to 39,801 vehicles travelling eastbound at one section of the road. Around 91 per cent of this traffic comprises of light vehicles. Victoria Road travelling through Rozelle also accommodates relatively high volumes of traffic, greater than 30,000 vehicles in each direction daily. City West Link ranges between around 22,000 to 27,000 across various traffic counter locations. The majority of traffic along these routes is light vehicles.

Private vehicles are the predominant mode of transport across the study area, with 39 per cent of residents travelling to work by this method.

Other modes of transport available across the study area include light rail, heavy rail and bus. At the time of the Census data collection in 2011, the light rail system from Lilyfield to Dulwich Hill was not operational. The introduction of the light rail may have an impact on commuter travel modes and subsequently the data presented is only reflective of commuter movement patterns as of 2011. The light rail network now runs from Central Station to Dulwich Hill via Glebe, Lilyfield, Leichhardt and Summer Hill. There are services every eight to 10 minutes in peak periods, with off-peak services every 15 minutes (Transport for NSW 2016).

Three rail lines intersect within the study area, the T1 North Shore, Northern and Western Line, the T2 Airport, Inner West and South Line and the T3 Bankstown Line. These provide rail access to the

suburbs of Ashfield, Summer Hill, Redfern, Erskineville, St Peters, Newtown, Sydenham, Eveleigh and Chippendale. At the time of the Census, rail transport was the primary mode of public transport across the study area carrying 19 per cent of resident commuters.

Bus transportation was the second preferred mode of transport across the study area carrying 13 per cent of residents. Parramatta Road, Victoria Road and King Street are important bus corridors, with a number of services operating both inbound and outbound from the city. Parramatta Road is the main corridor connecting residents of western Sydney to the Sydney CBD, with the highest number of transit passengers of any corridor in Sydney (40,000 in peak hour period towards CBD)[31]. There are no regular bus routes on City West Link. Although numerous bus routes operate across the study area, the main bus routes operating include:

Ashfield-Haberfield

- L37 running along Ramsay Street in Haberfield, along Norton Street, Balmain Road, Victoria Road across Anzac Bridge into the city
- L38 and L39 running along Ramsay Street in Haberfield into Norton Street and down Parramatta Road.

Leichhardt-Glebe

- 433 from Balmain to Broadway along Darling Street, Victoria Road, The Crescent and Broadway
- M50 along Victoria Road and across Anzac Bridge into the city
- 441 from Birchgrove, through Balmain across Anzac Bridge into the city
- 440 from Victoria Road, Rozelle, via Balmain Road, Norton Street and Parramatta Road to the city
- 470 from Lilyfield Light Rail, via Booth Street and Pyrmont Bridge Road to Broadway.

Alexandria-Erskineville

- 422 from St Peters via King Street to the city
- L23 from Kingsgrove via Illawarra Road, Enmore Road, and King Street to the city
- L28 from Hurlstone Park via King Street to the city through Newtown
- 352 and 355 from Marrickville via King Street to Bondi Junction
- M30 from Sydenham via King Street to the city.

A small proportion of residents travel to work by ferry (one per cent). This form of transport is only available in the Leichhardt-Glebe precinct, which recorded two per cent of commuters opting for ferry transportation and the Ashfield-Haberfield precinct recording one per cent of commuters. Ferry stops are located at Balmain East, Balmain, Birchgrove, Cockatoo Island, Drummoyne, Abbotsford and Chiswick.

5.5.2 Pedestrians and cyclists

Walking was the most common form of active transport for commuters across the study area with eight per cent of residents walking to work. The Alexandria-Erskineville precinct recorded the highest number of commuters walking to work (11 per cent), followed by Leichhardt-Glebe (eight per cent) and Ashfield-Haberfield (four per cent). Cumulatively across the precincts, a smaller percentage of commuters chose to cycle to work (three per cent). The Alexandria-Erskineville precinct recorded the highest number of cycling commuters (four per cent), followed by Leichhardt-Glebe (three per cent) and Ashfield-Haberfield (one per cent).

[31] NSW Government 2012, NSW *Long Term Transport Master Plan,* Transport for NSW, pg 86.

Figure 5-11 illustrates the separated dedicated cycling lanes and bicycle friendly roads relevant to the study area. Victoria Road and Anzac Bridge are the primary separate dedicated cycleways in the study area. *Sydney's Cycling Future 2013* strategy also identifies Lilyfield Road as a strategic bicycle corridor. There are limited separated dedicated cycling lanes or dedicated cycling lanes in the south of the study area around St Peters and Newtown. There are limited segregated cycling paths along Parramatta Road corridor and King Street. Cycling in these areas is encouraged on local roads instead.

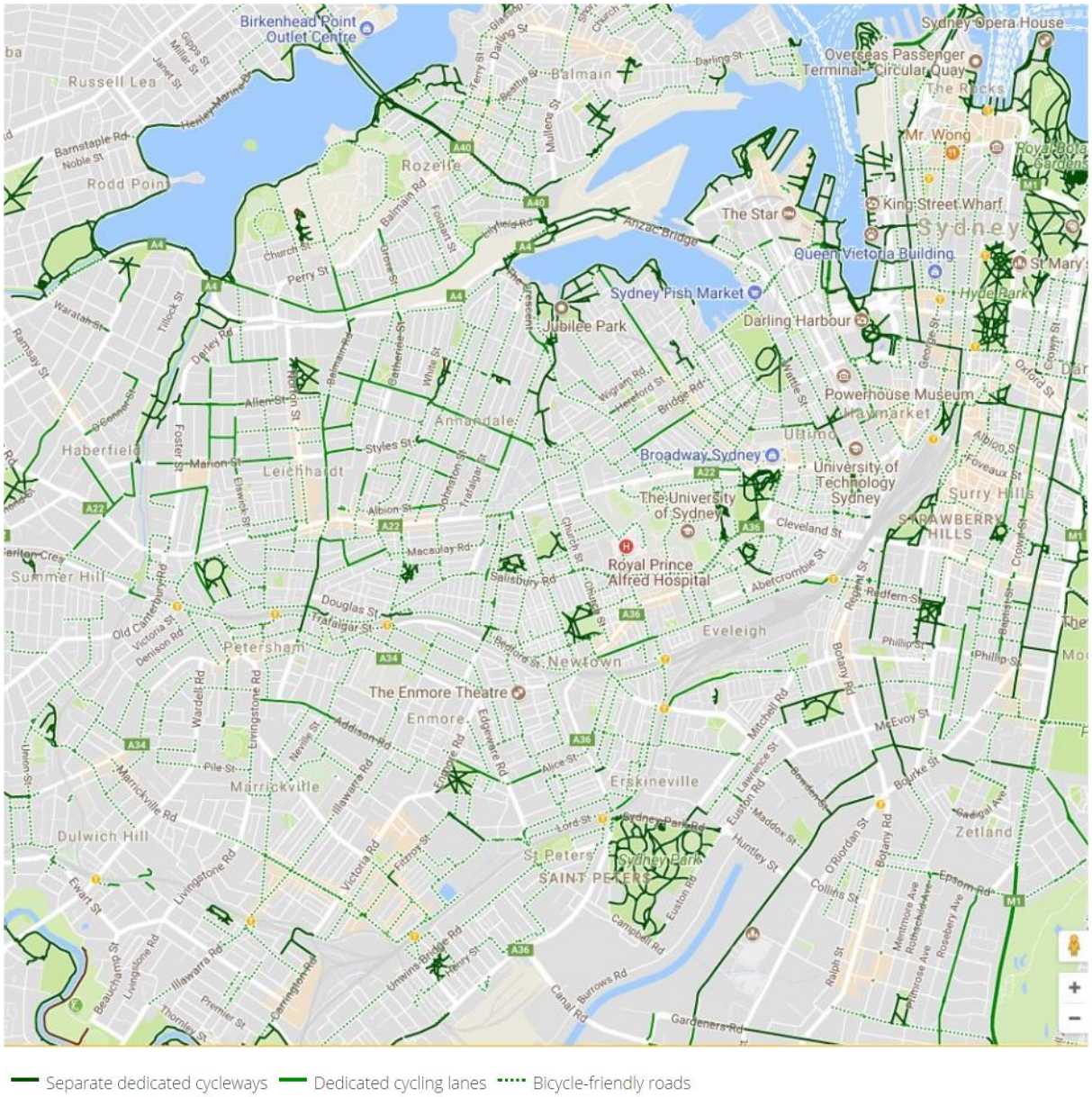


Figure 5-11 Cycling paths in Sydney

Source: Sydney Cycleways 2017

The current cycling network is predominantly oriented towards recreational trips rather than commuter trips, with dedicated cycleways concentrated within recreational spaces and along the foreshore.

There are a number of cycling and/or walking paths within the study area or in close proximity to the study area that would generate recreational cyclist activity. The Iron Cove walking and cycling path, Jubilee Park, Richard Murden Reserve, Sydney Park, Victoria Park and the Johnston Creek connection all provide separated and generally slow speed cycleways appropriate for children and inexperienced riders. These parks and spaces are also popular with recreational walkers.

As identified in **Appendix N** (Technical working paper: Active transport strategy) of the EIS, significant and highly valued active transport networks include the Bay Run, Glebe Foreshores, Anzac Bridge cycle and pedestrian shared path and the northern part of the Greenway (the active transport connection between Cooks River and Iron Cove). The shared path along Whites Creek to Buruwan Park is used by both cyclists and pedestrians. Shared pedestrian and cycle paths also run both sides of Victoria Road with important connectivity provided by overpasses at the city end of Victoria Road and across City West Link, providing connection to the foreshore.

The New M5 project includes a significant number of new and upgraded active transport links as a component of the project. The area around the St Peters interchange would include new separated cycleways, shared paths and pedestrian paths. Details of the new network can be found in in the **Appendix N** (Technical working paper: Active transport strategy) of the EIS and the New M5 EIS. Upgraded active transport links would also be provided by the M4 East project.

5.5.3 Freight and commercial vehicles

Increasing the productivity and efficiency of movement enables the efficient delivery of goods to consumers and increases the provision and accessibility of specific services (eg trade services). The project forms part of the Urban National Land Transport Network for Sydney, which identifies major connections through urban areas to ports, airports and intermodal facilities. These connections are considered of critical importance to national and regional economic growth, development and connectivity. The M4-M5 Link project provides a link between the M4 East and the New M5 to enable efficient movement of freight and commercial vehicles across Sydney to key metropolitan and regional markets.

Figure 5-12 illustrates and **Table 5-68** defines the motorways and routes of national significance. Parramatta Road currently operates as a major commercial vehicle thoroughfare supporting the delivery of goods and services to major centres such as Parramatta, Sydney Olympic Park and the Sydney CBD. City West Link, King Street/Princes Highway and Victoria Road are also main arterial roads within the study area. Canal Road is located in close proximity to the major industrial and port area around Sydney Airport and subsequently has a high number of commercial and heavy vehicle movements. The road traffic counters shown in **Figure 5-12** identify that:

- Nine per cent of road users are heavy vehicles along Parramatta Road
- Six per cent of road users along City West Link are heavy vehicles
- Five per cent of road users along Victoria Road are heavy vehicles
- Twelve per cent of road users along Canal Road are heavy vehicles.

The statistics for King Street and Enmore Road were not available at the time of writing the report.

Table 5-68 Road number and names

Road category	Road names
M1	Eastern Distributor, Southern Cross Drive
M4	Western Motorway
M5	M5 East
A1	General Holmes Drive, The Grande Parade, President Avenue, Princes Highway
A3	King Georges Road, Roberts Road, Centenary Drive
A4	City-West Link Road, The Crescent, Victoria Road, Western Distributor
A22	Broadway, Greater Western Highway, Parramatta Road
A34	Enmore Road, Stanmore Road
A36	Princes Highway, King Street, City Road
A40	Victoria Road

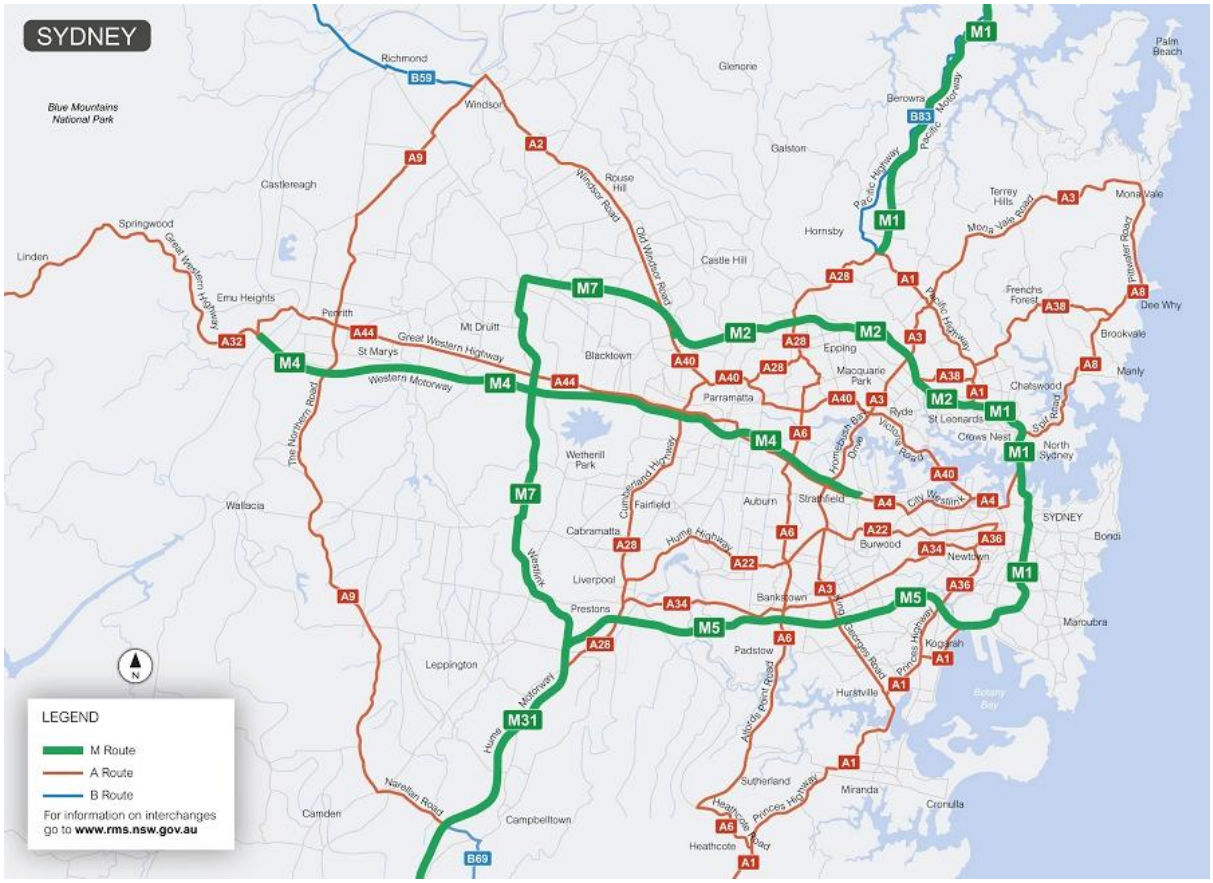


Figure 5-12 Motorways and routes of national significance

Source: NSW Government, Road number and name changes in Sydney, Department of Transport, Roads and Maritime

In 2011, the *NSW Freight and Ports Strategy*[32] identified that 63 per cent of freight tasks, reported in NSW, were undertaken by road. The *2014 State Infrastructure Strategy Update*, prepared by Infrastructure NSW also identified that urban roads support around 278,000 heavy freight vehicle movements and more than 1.2 million light commercial vehicle trips every day. Currently these movements are forced onto urban arterial roads due to insufficient motorway connectivity between major centres and distribution areas such as Port Botany and Sydney Airport.

The Sydney metropolitan area is however experiencing growth in traffic volumes, with longer peak periods and traffic congestion. As the population increases conflicts are arising where freight movements seek to utilise the same road network as other local users, causing adverse effects on transport efficiency and costs, community amenity and the environment. Sustained congestion increases the cost of freight movement and goods and service delivery, reducing the efficiency of the transport network and hindering business and economic growth. The *2014 State Infrastructure Strategy Update* identifies that congestion was costing Sydney around $5 billion a year, set to grow to $8 billion annually by 2020[33].

[32] Transport for NSW 2013.

[33] Infrastructure NSW 2014, State Infrastructure Strategy Update.

6 Consultation and community values

Community consultation is an integral aspect of the SEIA. The consultation process communicates values and issues that assist the decision making process for the project. This section presents a summary of the community values and feedback from consultation as it relates to the SEIA.

A range of communication and consultation activities conducted through different media for the M4-M5 Link project were undertaken during the development of the concept design and EIS. **Chapter 7** (Consultation) of the EIS identifies the community and stakeholder consultation undertaken for the project, along with the key issues raised.

Community values were also scoped from additional sources, including:

- Community strategic documents from each LGA as identified in **Chapter 4**
- Community Feedback Report (SMC 2016) prepared following the community briefing sessions between August and September 2016
- Agency and stakeholder submissions on previous WestConnex projects
- Agency and stakeholder submissions on the Rozelle Rail Yards site management works
- Community feedback from the Concept Design Report and associated community information sessions (held between May and August 2017)
- Agency comments on the M4-M5 Link project.

6.1 Consultation summary

Table 6-1 provides a summary of the key socio-economic issues raised during community and business consultation.

Table 6-1 Key social-economic considerations identified during community and business consultation

Key socio-economic considerations		Report section
Property impacts		
Property acquisition	· Appropriate compensation for property acquisition · Uncertainty and transparency around the property acquisition process · Operation of acquisition assistance phone line after project commencement · Loss of local businesses · Displacement concerns relating to the inability to relocate into same suburb.	**Section 7.3**
Property values	· Property value fluctuations due to uncertainty regarding: · Property acquisition locations and process · The alignment of WestConnex.	**Section 6.2**
Uncertainty	· Uncertainty regarding: · Property or neighbouring property(s) being acquired · Potential damage occurring to heritage homes · Housing being located in close proximity to project corridor · Tunnelling undermining building foundations · Disruption to electricity, water and gas services during construction.	**Chapter 6** (Construction work) of the EIS **Chapter 12** (Land use and property) of the EIS **Appendix F** (Utilities Management Strategy)

Key socio-economic considerations		Report section
Amenity impacts		
Visual	· Request for replanting of trees along Victoria Road after construction · Request for measures to reduce the visual impact of construction at compound locations.	**Section 8.2**
Noise and vibration	· Hours of construction and impact on local residents and businesses · Local areas including Lilyfield Road and Rozelle interchange · Disturbance at night and on weekends due to construction occurring outside of standard construction hours · Requests for noise assessments with associated mitigation measures and abatements · Requests for trucks to be precluded from using local roads during construction and operation.	**Section 7.2.2** **Section 8.2.2**
Air quality and human health	· Dust and contaminated waste during construction · The location, composition and filtration system of ventilation outlet · Proximity of residential, business and open space locations during operation · Residents' health and safety as a result of pollution and increased traffic on local roads during construction and operation. · Request for air quality studies before, during and after construction.	**Section 7.2.3** **Section 8.2.3**
Heritage	· Potential impact on residential heritage homes and conservation areas along the project corridor · Prioritise heritage protection and conservation · Protect heritage items in Glebe, specifically along Arundel Street.	**Section 7.4.1**
Access and connectivity impacts		
Public transport	· The temporary relocation of bus stops during construction · The design and integration of public transport.	**Section 7.1.3**
Access and connectivity	· Road closures during construction and operation · Construction compound locations · Tunnel site access locations · Connectivity between Rozelle and Glebe · Increase connectivity to local social infrastructure.	**Section 7.1** **Section 8.1**
Congestion	· Potential congestion as a result of construction sites · Further congestion along Anzac Bridge after construction · Upon operation, tunnel entries and exits would become congested areas.	**Section 7.1** **Section 8.1**
Parking	· Loss of on/off-street parking during construction and operation.	**Section 7.1.2** **Section 8.1.4**
Toll prices	· Toll prices discouraging use and result in congestion on toll free routes during operation.	**Section 8.6.3**
Active transport	· Increasing pedestrian and cycle path connectivity around the project · Providing a pedestrian over-crossing above City West Link and Victoria Road during construction and operation · Construct footbridge at Lilyfield Road · Open Glebe Island Bridge for pedestrian use	**Section 8.1.2** **Appendix N** (Technical working paper: Active transport strategy) of the EIS

Key socio-economic considerations		Report section
	· Provide cycle ways to connect and complete the 'greenway', linking Cooks River, Iron Cove and The Bays Precinct.	
Social infrastructure impacts		
Social infrastructure	· Loss of open space during construction and operation · Any changes to the Bay Run that compromise the existing efficiency of the active transport loop · Changes to Callan Park · Reinstated open space to include sporting facilities · Increased amenity and access to Sydney Park · Retention of Easton Park and Blackmore Park for community use.	**Section 7.10** **Section 8.3**
Consultation		
Notification	· Residents and businesses to be given adequate notification of project commencement · Engagement of residents and business located in close proximity to the tunnels · Comprehensive and transparent information to be made publicly available · Request that businesses are kept up to date and informed about the project, particularly during construction.	**Chapter 10**
Business and industry		
Access and connectivity	· Traffic management of congestion and bottleneck in relation to business amenity, passing trade and efficiency of business deliveries · Customer access as a result of changed environment.	**Section 7.9**
Parking	· Limited parking for customers and employees due to construction related activities · Construction workers competing for customer and employee car parking.	**Section 7.9**
Business visibility	· Impact on the visibility of businesses due to potential road detours, changed traffic volumes or construction related hoardings.	**Section 7.9**
Business revenue	· Increase in business revenue due to potentially more customers as a result of construction workers in area · Reduction in business revenue due to construction activity.	**Section 7.9**
Business amenity	· Dust and pollution concerns as a result of construction activity and construction traffic · Concern regarding increased noise and vibration around businesses.	**Section 7.9**

6.2 Community values

Community values are those that are held in common by residents and visitors in regards to a particular area or the enhancement of quality of life or sense of place. Values can be tangible or intangible. Physical aspects such as heritage items, social infrastructure or local features such as public art and trees are generally highly valued by communities, as are intangible elements such as the connection to water and places, the perception of safety and health or the sense of belonging and connectivity with people.

This section describes the community values held by residents, businesses and visitors in the study area. The community values have been informed through project consultation (summarised in **Table 6-1** and **Chapter 7** (Consultation) of the EIS and the review of the local government Community Plans and Strategic Plans as outlined in **section 4.4**).

As identified in **Table 6-1**, the community raised concern regarding property value fluctuations due to uncertainty around property acquisition locations and process, and the ultimate project alignment. An assessment of the impact of the project on residential and commercial property prices has not been included in the preparation of the EIS given the large number of factors that influence the value of a property. It is extremely difficult to anticipate market perceptions, particularly as these in turn are influenced by broader macroeconomic considerations (eg strength of the economy, outlook for economic growth, interest rate levels and availability of finance, unemployment levels). As such, a reliable assessment of the interaction between the project and the property market cannot be made with any certainty.

6.2.1 Neighbourhood identity and character

Neighbourhood identity and character relates to the distinctive features of a place or environment that generate a sense of ownership by the community and contribute to a person's appreciation of their surroundings. These features can be tangible or intangible. Results from community consultation and the policy review identified community values that were associated with neighbourhood identity and character are as follows.

- Public art should be integrated to create a distinct sense of place
- Local schools, preschools and centres of adult learning should remain a community focus with access to new technology
- Heritage should be protected and enhanced
- Significant trees and vegetation enhance scenic amenity and should be retained
- Open space contributes to neighbourhood identity with specific areas holding particular community importance included King George Park, Blackmore Park, Easton Park, the Glebe Foreshore Parks and Sydney Park.
- Local amenity in residential neighbourhoods and around open space is important both day and night
- Views and vistas of heritage, waterways and the city skyline are to be protected
- Businesses and community are to work together to improve the local economy
- Communities are to be equitable, cohesive, connected, caring, diverse, healthy, safe, culturally active, creative and innovative, and have a strong sense of belonging and place.

6.2.2 Community safety, health and well-being

Community safety, health and well-being are a key priority for communities within the study area. Community members indicated the importance of construction activities being undertaken in a manner that considers the health, safety and well-being of residents. The strategic plans also highlight safety, health and well-being as core principles. Results from community consultation and the policy review identified community values that were associated with community safety, health and wellbeing are as follows.

- Assistance should be provided for vulnerable, disabled and isolated people
- Construction traffic should be minimised on local streets to conserve safety for residents
- The health and safety of residents should be prioritised around construction areas
- Dust and contamination waste during construction should be minimised
- The location, composition and filtration system of the ventilation outlets should be carefully considered
- Comprehensive and transparent information should be made publicly available.

6.2.3 Community cohesion

Community cohesion refers to the connections and relationships between individuals and their neighbourhoods. Levels of community cohesion and sense of belonging are said to be good where communities have access to a diverse range of local and regional infrastructure, barriers to movement

are minimised and there are a variety of meeting places, which encourage strong support networks. Values relating to community cohesion were raised during consultation and within the strategic plans as follows:

- People feel a sense of belonging, connected to the local village, shops and people in the streets
- More accessible and efficient public transport is delivered
- A range of cultural facilities, opportunities for artistic expression, and an exciting range of events and entertainment opportunities are provided
- Connections to green spaces and public spaces are enhanced and encourage community groups to meet and share culture
- Acquisitions are minimised to prevent the displacement of people from their communities
- Traffic management is incorporated into construction plans to minimise congestion and bottlenecking in relation to business amenity, passing trade and efficiency of business deliveries
- Pedestrian and cyclist connections to the waterfront and public spaces are maintained and enhanced, particularly Glebe Foreshore Walks and the Bay Run
- Public transport is designed and integrated into existing environments
- Streets are walkable and safe to move around.

7 Assessment of construction impacts

Since the inception of the M4-M5 Link project, various options have been considered in the development of the project, including the location of the interchanges, the alignment of the mainline tunnel and the inclusion and configuration of the Iron Cove Link as a way to improve efficiencies and design outcome of the project.

In response to community concern and design constraints, a number of substantial changes have been made to the project design. An overview of options development and design alternatives have been outlined in detail in **Chapter 4** (Project development and alternatives) of the EIS. Project design alterations to reduce potential socio-economic construction impacts include:

- Adjustment of the project footprint to avoid using Easton Park at Rozelle during construction and to minimise impact on Lilyfield Road and the heritage listed Sydney Water sewerage pumping station
- Adjustment of the project footprint to avoid using areas around Blackmore Park, Leichhardt during construction
- Deletion of a construction site in Derbyshire Road, Leichhardt adjacent to Sydney Secondary College (Leichhardt campus) to prevent amenity, traffic and heritage impacts
- As a result of the deletion of the Camperdown interchange, adjustment of the mainline tunnel alignment further to the west which has avoided construction impacts on the Royal Prince Alfred Hospital and the University of Sydney
- The selection of spoil haulage routes to primarily follow the arterial road network and avoid local roads
- The restriction of hours for spoil haulage from the Darley Road construction site to standard construction hours to avoid noise, traffic and amenity impacts on local residents.

These design and construction changes have avoided several potentially substantial construction and operation impacts on the community and have improved the efficiency and design of the project outcome. Despite these improvements, construction of the project would still affect a range of socio-economic factors across the study area.

This section discusses the impacts that may be experienced across the study area due to construction works and utility works associated with the project. These works have the potential to affect residents, businesses, road users, social infrastructure users and the wider community, both positively or negatively. An assessment of the proposed project activities has been undertaken to determine the type and magnitude of the impacts and to identify measures to avoid, minimise, manage and mitigate these.

This section has been structured to assess the effects of construction on the broader socio-economics environment (**sections 7.1** to **7.8**) before identifying specific impacts on business and social infrastructure in **sections 7.9** and **7.10**. This assessment considers impacts on:

- Access and connectivity
- Local amenity
- Property acquisitions
- Community values
- Population and demography
- The local and regional economy
- Business and industry
- Social infrastructure.

7.1 Access and connectivity

Changes to road, public transport and active transport are likely to arise from the establishment and operation of construction sites, portals, interchanges, surface road changes and ancillary infrastructure that trigger alterations or disruptions to traffic and transport connections and access to properties, businesses and social infrastructure. These include changes to:

- Road network efficiency and connectivity
- Parking availability
- Public transport connectivity
- Pedestrian and cyclist connectivity.

The direct impact of changes in property access for residents, businesses and social infrastructure have been discussed in **section 7.9** (business) and **section 7.10** (social infrastructure).

7.1.1 Road network

Changes in road network efficiency and connectivity would occur across the study area as a result of construction activities. This would include traffic disruptions and diversions due to temporary, partial or full closures of roads, increased construction traffic (including heavy vehicles) and changes to speed limits near construction works. All traffic modifications, including road closures and diversions, are outlined in detail in **Appendix H** (Technical working paper: Traffic and transport) of the EIS. These changes are likely to affect general motorists, freight operations and deliveries. Impacts on public transport are discussed in **section 7.1.3**. Changes in access to businesses are discussed in **section 7.9** and changes in access to social infrastructure are discussed in **section 7.10.**

Direct and indirect traffic disruptions are likely to be experienced on local and arterial roads in most suburbs that are in close proximity to construction sites. This would include the suburbs of Ashfield, Haberfield, St Peters, Camperdown, Annandale, Lilyfield, Leichhardt, and Rozelle.

The significance of the impact on the performance of the road network would vary depending on the traffic volumes that the road carries and the level of importance of the transport route.

Direct local road impacts

Local road alterations, would affect the accessibility of areas for local residents, businesses and visitors. Direct local road impacts are expected on:

- Northcote Street (Haberfield Option A - C3a), which would be closed at the intersection (as per the existing arrangement of the M4 East project) for the duration of construction. This intersection would be reinstated at the completion of construction
- Darley Road, due to temporary lane closures during the establishment of construction vehicle access to the site
- Chapman Road at Annandale, due to temporary changes of the intersection. Access to the commercial premises that use Chapman Road, including the Multihull Central Marina, as well as the Glebe Foreshore Parklands would be protected and maintained at all times
- Gordon Street between Lilyfield Road and the Rozelle Rail Yards, which would be permanently closed as part of the project
- Lilyfield Road, which would require temporary lane closures for short periods. Access to Lilyfield Road from Victoria Road may be temporarily restricted during the works however alternative access to Lilyfield Road would be available from Hornsey Street and Gordon Street during these periods
- Hornsey Street at Rozelle, which would require lane closures for short periods. Access to Hornsey Street from Victoria Road would require full closure during the works for short periods however alternative access would be available from Lilyfield Road and Gordon Street during these periods

- Quirk Street at Rozelle, which would require lane closures for short periods. Access to Quirk Street from Victoria Road would require full closure for short periods. Alternative access would be available from Hornsey Street and Gordon Street
- Moodie Street at Rozelle, where temporary lane closures of one lane may be required to facilitate utility works
- Callan Street at Rozelle, where access at the intersection with Victoria Road would require temporary closures. Alternative access would be available during these periods from Springside Street and McCleer Street
- Toelle Street at Rozelle, where access at the intersection with Victoria Road would require temporary closures. Alternative access would be available during these periods from Springside, McCleer, Callan and Manning streets
- Clubb Street at Rozelle, where access to Victoria Road would be permanently closed and a cul-de-sac established. Alternative access to Clubb Street would be available via Manning Street via Toelle Street or from Callan Street and McCleer Street via Springside Street
- Byrnes Street at Rozelle, where temporary lane closures of one lane may be required to facilitate utility works. Works would also be carried out to move the terminus near Victoria Road south to accommodate the revised design
- Bignell Lane at Annandale would be permanently realigned between Mallett Street and Pyrmont Bridge Road. Temporary closures of Bignell Lane would be required during construction to allow for the realignment works. Rear access to commercial properties along Bignell Lane would be maintained during construction.

These streets are primarily residential streets. Maintaining access to residential properties, including ensuring the operability of clearways and driveways, is important in enabling the continuity of an individual's daily routine. In most instances, these modifications would be temporary with local roads reinstated upon completion of construction works. Properties along these roads may experience a marginal increase in travel time. Closures would be outside of peak periods or within evening periods where feasible and reasonable.

Overall, the effect of construction on local roads would be medium term at a locality extent. The severity of change from the existing baseline environment would be small. The consequence of change would be slight and the likelihood high. As such, the overall significance of impact on the socio-economic environment would be minor negative.

Direct arterial road impacts

Construction impacts on major roads have the capacity to influence the performance of the broader road network both nearby and further afield. Such changes associated with the project are likely to affect both local communities and the broader region, potentially resulting in adverse impacts upon the socio-economic environment. Construction impacts on major road networks would increase traffic congestion, travel time, accessibility of local areas and the efficiency of freight, commercial vehicles and public transport movements. However, closures would be planned for outside of peak traffic periods where feasible and reasonable. Arterial road impacts are expected on:

- Parramatta Road, Ashfield and Haberfield, where works would be carried out to facilitate ingress and egress for construction traffic
- City West Link at Leichhardt, where a right turn lane would be included to enable construction vehicles to turn into Darley Road
- City West Link at Lilyfield and Rozelle, where works would be carried out to facilitate ingress and egress for the Rozelle civil and tunnel site and upgrades and improvements to the eastbound and westbound carriageways. Works would require temporary traffic diversions and short-term lane closures
- The Crescent at Annandale and Rozelle, where works would be carried out to facilitate ingress and egress for The Crescent civil site and to realign The Crescent and reconstruct the intersection with City West Link. The new alignment of The Crescent would be constructed 'offline' (that is, next to the existing alignment) and traffic would be switched onto the new alignment when ready.

The old alignment of The Crescent would be demolished. Works would require traffic diversions, traffic signal modifications and some short-term lane closures. Access to the commercial premises in the marina as well as the Glebe Foreshore Parklands would be maintained at all times

- Victoria Road at Rozelle, where works would require some short-term lane closures (outside peak periods), traffic signal modifications and temporary diversions at the intersection with The Crescent to allow for construction of the new bridge in line with the permanent design. All traffic lanes in each direction would generally be maintained
- Victoria Road near Iron Cove, where works would be carried out to facilitate ingress and egress for the Iron Cove Link civil site and upgrades and improvements to the eastbound and westbound carriageways. Works would require temporary traffic diversions and short-term lane closures
- Parramatta Road and Pyrmont Bridge Road, Annandale where works would be carried out to facilitate ingress and egress for construction traffic.

As identified in **Appendix H** (Technical working paper: Traffic and transport) of the EIS, there are three key areas that would require detailed traffic staging due to the substantial existing volumes of traffic. Detailed traffic staging plans would be required at:

- Victoria Road/The Crescent/Anzac Bridge approach intersection – reconstructing the intersection to accommodate existing connectivity, the new M4 East Motorway/Iron Cove Link to Anzac Bridge connections and construction of a new bridge at Victoria Road
- City West Link/The Crescent intersection – realigning The Crescent at Annandale to the west, building a new bridge over Whites Creek and modifying the intersection
- Victoria Road at Iron Cove – realigning the westbound (southern) carriageway of Victoria Road to create sufficient space to build new tunnel portals and entry and exit ramps for the Iron Cove Link.

Appendix H (Technical working paper: Traffic and transport) of the EIS indicates that the majority of arterial roads likely to be directly affected by construction work are already operating at or near their capacity during peak periods. The following discussion identifies the socio-economic effects of construction if traffic delays occur.

Traffic delays have the capacity to affect freight and commercial vehicle transport efficiency, commuter travel times and general access and connectivity to surrounding areas or employment centres. These impacts would have direct effects on the socio-economic environment, costing individuals and businesses time and money. The consequence of this adverse traffic environment may also have secondary effects on the socio-economic environment, with the potential that individuals would spend less time and money at local businesses within the study area. This may influence the revenue generation and productivity of the local economy.

As identified in **section 5.5.3**, freight and commercial vehicle movements are an integral component of the economy. The major arterial routes of Parramatta Road, City West Link, Wattle Street and Victoria Road carry high volumes of heavy vehicle movements, which would be affected by the road alterations during construction. Numerous industries are dependent upon efficient transport along these arterial roads to service business operational requirements. Network inefficiencies along these major freight and commercial vehicle routes would increase labour and operating expenses, with freight costs anticipated to increase due to the time shipments take in the supply and delivery chain. This would have an impact on both local and regional industries.

Increased traffic congestion may also reduce the amenity of an environment, with idle vehicles increasing noise impacts and enhancing the concentration of vehicle emissions in a particular area. This may affect human health and residential and business amenity, resulting in the reduction in the appeal of a place and the potential reduction in business revenue or return customers.

Increases in traffic may also reduce roadside safety, particularly in areas heavily frequented by pedestrian and cyclists, such as near schools, child care centres, aged care facilities and near public transport stops. This would particularly be the case at Alt Street due to the proximity of Haberfield Public School and the Parramatta Road East civil site (C3b) and along Parramatta Road due to the proximity of Bridge Road School and the Pyrmont Bridge Road tunnel site (C9).

The project attempts to minimise adverse impacts from road closures by reducing the lane closures during peak periods. At all locations where temporary and permanent road closures are required, access to properties would be maintained and signage for road closures or detours would be installed. Specific traffic management measures would be determined during detailed design and documented in a CTAMP prepared as part of the CEMP.

The implementation of the CTAMP would assist in reducing the negative impacts associated with changes and alterations to the road network. This Plan would however not be capable of mitigating all impacts, with inefficiencies still anticipated to affect road users. Construction impacts on arterial roads have the capacity to affect a large number of people and businesses both locally and regionally. Overall, the effect of construction on arterial roads would be medium term across a regional extent. The severity of change from the existing baseline environment would be medium. The consequence of the impact would be moderate, with a high likelihood. As such, the overall impact upon the socio-economic environment would be moderate negative**.**

Construction vehicles

The use of local roads by construction traffic was identified as a key concern for both community members and business operators during consultation for the project. The layout and access arrangements for the construction ancillary facilities have had regard to this concern. Where possible, vehicle access points would have direct access to the arterial road network to minimise the need for heavy vehicles to travel on local roads, through residential areas.

Light vehicles

The number of daily light vehicle, one way movements, is expected to range from 10 to 350 light vehicles per construction site. The greatest number of light vehicle movements are anticipated at:

- Rozelle civil and tunnel site (C5) estimating 350 daily one way vehicle movements mostly affecting Lilyfield Road on to Victoria Road and City West Link
- Northcote Street civil site (C3a) estimating 150 daily one way vehicle movements affecting Wolseley Street and Wattle Street
- Parramatta Road East civil site (Option 3b) estimating 150 daily one way vehicle movements affecting Alt and Bland streets and Parramatta Road
- Victoria Road civil site (C7) and estimating 140 daily one way vehicle movements affecting Victoria Road and Hornsey Street
- Iron Cove Link civil site (C8) estimating 140 daily one way vehicle movements affecting Victoria Road.

These light vehicle movements may reduce the amenity of local streets around the construction sites and increase traffic at local road intersections. Increased traffic, particularly on local streets may affect the safety of the environment, particularly if those streets are primarily residential and had previously experienced lower traffic numbers. This would be the case for Wolseley Street, Alt Street, Bland Street and Hornsey Street. Alt Street is also located in close proximity to the Haberfield Public School, which would generate larger vehicle numbers in its own right. The increase in number of light vehicles on this road may affect intersection performance and may reduce road safety, particularly for children.

Light vehicles would generally distribute fairly quickly across the road network, with minimal effect on the performance of the road network during peak periods.

Heavy vehicles

Heavy vehicles would also be required to deliver and remove construction plant equipment and materials, spoil and waste from the construction sites. Specific heavy vehicle access, egress and haulage routes are described in **Appendix H** (Technical working paper: Traffic and transport) of the EIS. Daily heavy vehicle movements would vary across the construction sites, ranging from 10 to 517 per site. The greatest number of heavy vehicle movements are anticipated at:

- Rozelle civil and tunnel site (C5) with 517 daily one way heavy vehicle movements anticipated

- Parramatta Road West civil and tunnel site (C1b) with 140 daily one way heavy vehicle movements anticipated
- Haberfield civil and tunnel site (C2a) with 136 heavy vehicle daily one way heavy vehicle movements anticipated
- Wattle Street civil and tunnel site (C1a), Pyrmont Bridge Road tunnel site (C9), and Campbell Road civil and tunnel site with 133 daily one way heavy vehicle movements at each of these locations
- Northcote Street civil site (C3a) and Darley Road civil and tunnel site (C4) with 100 daily one way heavy vehicle movements anticipated.

All other construction sites, are anticipated to experience less than 100 heavy vehicle movements per day.

To reduce traffic and amenity impacts on local roads, spoil haulage routes would operate mainly on arterial roads including Parramatta Road, M4 East tunnels (if possible, when available), Wattle Street, Victoria Road, The Crescent, City West Link, Pyrmont Bridge Road, Campbell Street and the Princes Highway. Spoil management has been discussed in **Chapter 23** (Resource use and waste minimisation) of the EIS, which outlines the preferred management of spoil haulage and waste minimisation. A Construction Waste Management Plan, as part of the CEMP, would be prepared and implemented for the project.

Parramatta Road and City West Link would be cumulatively the most effected by heavy vehicle movements, as multiple construction sites link to these roads. These sites already carry significant traffic volumes with additional construction vehicles potentially further contributing to congestion and a reduction in road network efficiency. City West Link would carry around 700 daily (one way) heavy vehicle movements that would, in most instances, connect to the M4 East Motorway. Around 208 of these heavy vehicle movements would be during peak AM and PM periods. Where possible, spoil haulage from Haberfield would also utilise the M4 East tunnel.

The above mentioned arterial roads already cater for heavy vehicles, with the increased number of construction vehicles unlikely to further reduce amenity. The increased number of construction vehicles would however contribute to congestion and may reduce trip efficiency between Sydney City and the west. The residents and employees that reside in the precincts of Ashfield-Haberfield and Leichhardt-Glebe would be most affected by any reductions in the efficiency of the road network.

Construction traffic would be managed through a Construction Traffic and Access Management Plan (CTAMP), which is to be prepared as part of the CEMP. Through effective management, negative impacts of construction vehicle traffic on the socio-economic environment would be reduced.

Overall, the effect of construction vehicle traffic on the road network would be medium-long term, generally confined to the LGA. The change from the baseline environment would be medium. The overall consequence of construction traffic would be moderate, with effects highly likely to occur. As such, the overall impact upon the socio-economic environment would be moderate negative.

Road and intersection performance

Appendix H (Technical working paper: Traffic and transport) of the EIS identifies the changes in level of service of roads and intersection performance due to construction activities. Generally, changes in level of service or intersection performance are the result of lower speed limits around construction areas, removal of traffic lanes, detours or the introduction of new intersections.

Although there is no evidence regarding these impacts from the traffic modelling, at a worse case, these impacts may result in:

- Route redirection (or ‘rat-running’) as drivers seek alternative faster routes on local roads or parallel road to avoid traffic congestion
- Modal shift as people seek alternative transport forms to travel to destinations
- Inefficiencies caused by reduced traffic mobility both within and outside peak periods.

These changes would have an impact on travel time and may reduce the accessibility of areas or generate secondary impacts (eg amenity, reduced safety) on surrounding neighbourhoods. Route redirection may alter the volume of traffic on local streets and increase pressure on local intersections. Examples of areas where this may occur include:

- Streets to the north of Rozelle civil and tunnel site (C5) where route redirection would seek to avoid congestion along City West Link
- Streets to the west of Iron Cove Link civil site (C8) where route redirection would seek to avoid congestion on Victoria Road
- Streets around the Pyrmont Bridge Road tunnel site (C9) where route redirection would seek to avoid congestion on Parramatta Road and Pyrmont Bridge Road.

This may affect the safety and amenity of neighbourhood streets due to increased traffic volumes and may reduce accessibility for residents living in these areas. Local streets, which typically carry limited traffic volumes, are commonly utilised by residents (particularly children) as additional recreational spaces. The ability to congregate and recreate in a street encourages social interaction between neighbours. Increased traffic volumes on local streets, reduces the safety and capacity of residents to utilise these spaces and may contribute to instances of community severance.

During construction, it may become more efficient for people to catch public transport rather than drive, due to the increase in traffic. This modal shift would increase demand on the public transport system, adding to crowding on services or requiring additional services to be scheduled. The provision of additional services would be an expense for service providers that may not have been previously budgeted. It may also reduce the flexibility and reliability of commuting for some people. Modal shift would however assist in alleviating traffic, benefitting the efficiency of the broader network.

Traffic congestion generally affects commuter travel time. This in turn may affect the amount of time people may spend with family and friends or undertaking personal activities (outside commute and work times). Traffic congestion may also increase stress levels as people become more anxious about reaching their destination on time.

Increased travel time has economic impact, potentially creating inefficiencies for freight operations and business servicing and deliveries. It may increase costs to businesses and the economy due to longer trip time, additional driver wages and fuel consumption. Traffic delays also affect accessibility for residents, businesses and social infrastructure users. This hindrance to access may deter customers or visitors from travelling to an area, potentially affecting business revenue or social infrastructure utilisation.

As outlined in **Appendix H** (Technical working paper: Traffic and transport) of the EIS, a number of the roads and intersections in the study area are already constrained or at capacity in the peak periods. The introduction of construction works in these areas is likely to increase intersection waiting times periods and travel times for road users.

During construction, changes in road level of service (LoS) are forecast on the following roads:

- On Parramatta Road, north of Wattle Street, the eastbound mid-block level of service is forecast to drop from LoS D to LoS E in the PM peak hour
- On City West Link, west of The Crescent at Rozelle, the westbound mid-block level of service is forecast to decrease from LoS E to LoS F in the AM peak hour.

The level of service on all other road is forecast to remain stable with only minor positive or negative variances in delays expected throughout construction.

Intersection performance across the study area during construction was also assessed in **Appendix H** (Technical working paper: Traffic and transport) of the EIS. This report indicated that the majority of intersections were unlikely to experience significant increases in average delays and the overall impact of construction activities on the road network would be minimal. Despite this, some prominent intersections would experience a decline in performance. These include:

- Wattle Street and Ramsay Street intersection (PM peak hour)
- Dobroyd Parade, Timbrell Drive and Mortley Avenue intersection (AM and PM peak hours)

- City West Link Road and James Street intersection (AM and PM peak hours)
- City West Link and The Crescent intersection (AM and PM peak hours).

It is noted that this is a worst-case assessment, based on peak construction traffic levels, and adverse road and intersection impacts would be expected to reduce once peak construction is complete.

Increased intersection delays and traffic congestion have the capacity to:

- Increase stress and anxiety for road users (**section 7.1**)
- Reduce resident, business and social infrastructure accessibility (**section 7.1**)
- Increase air and noise pollution (**section 7.2**)
- Incur greater service and delivery costs for businesses (**section 7.9**)
- Affect the costs and efficiency of the freight network (**section 7.9**).

Although there are predicted delays and longer waiting periods at intersections, the variances between the 'with' and 'without construction' scenarios are in most instances, less than five per cent. Construction would generate a small net worsening of intersections across the study area. The effect would be medium term and has the capacity to alter the efficiency of the network across the LGA. The consequence of the changes on the socio-economic environment would be moderate, with a high likelihood. As such, the overall impact upon the socio-economic environment would be moderate negative.

Road network summary

Overall, the changes to the road network due to the construction of the project would have an adverse impact on the socio-economic environment. Construction of the project would generate an increase in construction vehicle traffic on the roads and noticeably affect some intersection and road performances, as well as having a direct impact on local and arterial roads. These changes have the capacity to reduce the amenity of the environment, affect health and safety of commuters and surrounding communities, impact on motorist, commercial vehicle, freight and commuter efficiency and costs and reduce overall access and connectivity. The impacts may also affect the economic productivity of local and regional industries.

A CTAMP would be prepared as part of the CEMP to address, manage and reduce impacts on surrounding communities, wherever possible. To reduce the uncertainty around traffic and transport changes, it is recommended a Community Communication Strategy (CCS) be developed for the project. The details of the CCS are outlined in **Chapter 10**. Clear communication regarding changes in the road and traffic environment during the project would assist in reducing uncertainty and enable road users to adequately plan for the changes. Where possible, it is recommended that project information be graphically represented providing information regarding alternative travel routes, the additional distances and the duration that detours would remain in place.

The effective implementation of these management measures would reduce the extent of adverse construction impacts on the socio-economic environment. It is recognised that these measures would be unable to alleviate all socio-economic impacts arising from the impact of construction on road performance.

The construction effects would extend for a medium duration and would potentially affect the efficiency of road networks across the broader LGA. The effects would reflect a medium change from the existing baseline road network condition. The consequence of these changes is moderate and with impacts having a high likelihood of occurring. The overall significance of impact on the socio-economic environment would therefore be moderate negative.

7.1.2 Parking availability

Alterations to parking availability near construction compounds and other work areas may affect the availability of parking for local residents, commuters, businesses and social infrastructure users.

The loss of parking spaces during the construction phase was a specific concern raised during community consultation and the business impact survey. Of the businesses surveyed, 61 per cent

thought the project would have no impact on parking while 39 per cent identified that a reduction in parking would have a negative impact on their business. This concern was particularly prevalent for businesses in close proximity to the construction compounds, such as those in Camperdown and Rozelle.

The main reasons for decreases in parking availability identified by businesses and residents were:

- The increased number of construction workers in the area
- The potential for parking to be removed due to the presence of construction sites.

During construction, some un-restricted on-street parking spaces would be temporarily or permanently lost due to the presence of construction compounds. This is likely to be confined to:

- The northern carriageway of Darley Road, Leichhardt between Francis Street and Charles Street (on-street car parking to be reinstated upon completion)
- The eastbound carriageway of Hornsey Street, Rozelle near Victoria Road
- Callan, Toelle and Clubb streets, Rozelle near Victoria Road, adjacent to the premises being acquired
- Parking along the southern (westbound) carriageway of Lilyfield Road, Rozelle
- Informal car parking in King George Park, adjacent to Manning Street, Rozelle to facilitate the construction of the bioretention facility.

Depending on the alignment of the project design and utilisation purpose of the car parks, some of these car parking spaces would be reinstated upon completion of required works, generally within the short-term.

The removal of parking spaces on Darley Road would reduce the availability of on-street parking for light rail commuters and would increase demand for parking on other nearby streets. Should construction workers also use on-street parking the demand for parking in this area would further increase. Local residents would then be competing with both regular commuters and construction workers for parking. A similar scenario may occur at the Rozelle Bay light rail stop, which is in close proximity to The Crescent civil site (C6).

To reduce the impact of construction worker parking in the various neighbourhoods, construction compounds have been designed to provide around 700 dedicated car parking spaces across the following construction sites:

- Northcote Street civil site (C3a) – around 150 car parking spaces (if Option A is used)
- Parramatta Road East civil site (C3b) – around 140 car parking spaces (if Option B is used)
- Rozelle civil and tunnel site (C5) – around 400 car parking spaces
- Campbell Road civil and tunnel site (C10) – around 150 car parking spaces.

The provision of on-site construction worker car parking at the Darley Road, Pyrmont Bridge Road and Iron Cove Link construction sites is limited, however alternative arrangements to supplement on-site construction car parking would be investigated during detailed design.

Construction workforce would also be encouraged to use public transport. There are existing bus and light rail services in close proximity to most of the construction sites. Catching public transport would not be possible for all workers, however, as some may be required to work late/night shifts or carry tools/equipment with them as part of their construction activities.

Residential streets, in close proximity to construction sites, which are not constrained by parking time limits, would likely experience an increase in construction worker parking. Elderly people, those with a disability or families with young children, who may have difficulty walking greater distances, would be particularly affected if they were required to park further away from their homes.

The removal or increased competition for on-street parking would also affect parking convenience for customers, clients and workers of local businesses. This could lead to a decision by customers/clients to use an alternative service or business, resulting in a decline in business revenue (see **section 7.9**).

Similarly, for social infrastructure users, enhanced competition for car parking or parking access restrictions could lead to them choosing to use alternative facilities, potentially severing ties with community networks or affecting personal routines (see **section 7.4.3**).

The extent of parking impacts around particular construction compounds would vary dependent on the number of workers expected at each site and the availability of suitable alternative public transport options. In higher density areas, such as surrounding the Pyrmont Bridge Road tunnel site (C9), an increase in around 100 construction workers would place additional pressure on an already constrained parking area. This area is mixed use, with residents, employees and social infrastructure users already competing for parking. The addition of construction workers to this area would increase competition for parking, potentially raising stress and anxiety levels for motorists seeking parking spaces, deterring customers from businesses and reducing accessibility for residents and employees.

A car parking strategy would be prepared and would include items such as forecasting of construction parking demand, review of existing parking supply and use on local streets in the area, impact on existing parking, consultation activities and proposed mitigation measures, such as management of workforce parking and transport, alternative parking arrangements and communication and engagement. This would include the identification of areas where there are high levels of existing parking demand around the construction ancillary facilities and works sites and identifying alternative car parking sites for use by the construction workforce. Processes for monitoring, reporting and corrective actions would also be part of the strategy.

The strategy would be developed in consultation with local councils and stakeholders associated with public facilities adjacent to project sites, as well as with the M4 East and New M5 contractors (where relevant) to identify opportunities to access parking during their respective construction periods and once those periods are completed.

The construction effects would extend for a medium-long duration, however would generally be confined to a suburb extent. The effects would result in a medium change from the existing baseline condition. The consequence of the construction effects would be slight, however there would be a high likelihood of the effects occurring. The overall impact on the socio-economic environment would therefore be minor negative.

7.1.3 Public transport network

During construction, public transport in the project corridor and surrounding areas may be affected by the relocation of stops, increases in traffic, road alterations during traffic staging or delays arising from congestion. Community, stakeholder and business consultation identified changes to public transport as an important concern. The business survey respondents suggested that about 16 per cent of staff and customers rely on public transport to access businesses within the study area.

The construction of the project would not directly affect the operation of heavy rail or light rail services. Passenger access to stations within or in proximity to the study area may however be affected by temporary traffic changes and congestion arising from the presence of construction works. Construction works would affect light rail stops at Leichhardt North (Darley Road) and Rozelle Bay (The Crescent). In both cases, access to light rail stops would be retained at all times, although some local diversions of pedestrian movements may be required.

Construction would have a more tangible impact on bus public transport passengers due to:

- The temporary or permanent relocation of bus stops, potentially increasing the distance bus patrons are required to walk
- Slower travel speeds due to congestion and increased intersection delays, therefore affecting commuter travel time or the potential for missed transport connections due to the delays
- Reduced reliability of bus service timetabling due to traffic congestion or detours.

The project would require temporary or permanent modifications to existing bus infrastructure around the Rozelle and Iron Cove interchange surface works, including:

- Two bus stops on The Crescent:
    - The relocation of the existing northbound bus stop at The Crescent, currently located around

150 metres north of Johnston Street (permanent)

- The relocation of the existing southbound bus stop at The Crescent, currently located around 100 metres north of Johnston Street (temporary).

· Five bus stops on Victoria Road:

- The relocation of the existing northbound bus stop on Victoria Road, currently located around 20 metres south of Lilyfield Road (temporary)
- The relocation of the existing northbound bus stop on Victoria Road, currently located between Lilyfield Road and Hornsey Street (temporary)
- The relocation of the existing southbound bus stop on Victoria Road, currently located around 100 metres south of Robert Street (temporary)
- The relocation of the existing westbound bus stop on Victoria Road, currently located between Toelle Street and Clubb Street (temporary)
- The relocation of the existing eastbound bus stop on Victoria Road, currently located between Terry Street and Crystal Lane (temporary).

This would result in some pedestrians being required to walk slightly further to bus stops, however the extra distance is minor (less than 200 metres) and would be manageable for most people. Where bus stops are relocated, pedestrian access, including disabled facilities, would be maintained.

Upon operation, bus stops would be reinstated generally in the same location as existing. The northbound bus stop on The Crescent would be permanently moved to the south to allow for the realignment. This would have no discernible change from the baseline condition.

Bus services near construction compounds and project-related road works may experience a reduction in passenger amenity while waiting for buses. Noise walls and construction hoarding around sites should assist in mitigating this issue. As commuters also spend a relatively small amount of time waiting for transport services, it is likely that patrons would be able to tolerate and adapt to the change.

Effects on bus travel times due to traffic congestion may affect the following routes:

· Routes travelling along Victoria Road south and north bound

· Route 433 that travels along The Crescent

· Route 438 and 439 that travel along Ramsay Street

· Routes 461 with a north and south bound bus stop on Parramatta Road near Wattle Street, Haberfield (Stop ID 204512 and ID 213132)

· Routes travelling eastbound along Parramatta Road (413, 436, 438, 439, 440, 461, 480, 483, L38, L39 and M10) using the stop on Parramatta Road at Mallett Street (Stop ID 203835).

There are no planned road closures along any existing bus routes, however some traffic lane closures and speed limit restrictions would be required, which may affect the efficiency and potentially reliability of bus services.

Based on the above, impacts upon bus routes would likely be temporary and confined to specific bus routes, with impacts managed and mitigated where possible through the CTAMP. Any changes to bus stops and bus services would be undertaken in consultation with Transport for NSW and the bus service provider, with relevant information being communicated to bus users.

Overall, the effect of construction on the public transport network would be medium term at a suburb extent. The severity of impact on the baseline condition would be small and the consequence of construction effects would be slight, with a likelihood of possible. As such, the overall significance of impact on the socio-economic environment would be minor negative.

7.1.4 Pedestrian and cyclist network

The construction of the project requires some existing pedestrian footways and cycling paths to be closed or diverted, has the potential to affect travel duration, movement patterns and accessibility. As detailed in **Appendix H** (Technical working paper: Traffic and transport) of the EIS, a key objective of the construction program would be to minimise disruption to pedestrian and cyclists and to maintain network efficiency by transferring from the existing infrastructure to final infrastructure as soon as possible.

Section 5.5.2 of the existing environment chapter, highlights a number of existing strategic links for cyclists and pedestrians in and around the project. Construction of the project would slightly alter or require diversion to some of these strategic links, including:

- The Bay Run
- Shared paths along Victoria Road
- Victoria Road pedestrian and cyclist overpass
- The cyclist and shared pathways along Lilyfield Road
- City West Link overpass near Victoria Road.

These links were identified during consultation as being important commuter links. These temporary alterations may affect connectivity, local amenity (see **section 7.2**) and community values (see **section 7.3**).

Table 7-1 identifies the proposed alterations to the pedestrian and cyclist environment during construction. To maintain connectivity, all necessary diversions would be in place prior to the removal of existing linkages (including overpass). Figures of the pedestrian and cyclist diversions may be found in **Appendix H** (Technical working paper: Traffic and transport) of the EIS.

Table 7-1 Alterations to the pedestrian and cyclist network

Construction compound	Construction duration	Alterations	Impact
Wattle Street civil and tunnel site (C1a), Haberfield civil and tunnel site (C2a), Northcote Street civil site (C3a)	Medium term (4 years)	· Increased interactions between construction vehicles and pedestrians using footpaths, particularly along Parramatta Road near the Northcote Street civil site (C3a) and along Walker Avenue at Haberfield · Temporary closure of a section of footpaths on both sides of Northcote Street at Haberfield during construction. This would be a continuation of the current closure of these sections of footpaths along Northcote Street to facilitate construction of the M4 East project. Alternative access to Parramatta Road would be provided via Ash Lane and either Wolseley Street or Wattle Street at Haberfield · No diversions would be required.	Reduced safety and amenity
Parramatta Road West civil and tunnel site (C1b), Haberfield civil site (C2b), Parramatta Road East civil site (C3b)	Medium term (4 years)	· Increased interactions between construction vehicles and pedestrians and cyclists along Alt Street near the Parramatta Road West civil and tunnel (C1b) and Bland Street near the Parramatta Road East civil site (C3b) · Periodic, short-term closures of footpaths on both sides of Alt Street on the eastern and western sides of Parramatta Road. These would be most likely to occur during site establishment, when access to these sites is being established. Where a footpath is temporarily closed, the	Reduced safety and amenity

Construction compound	Construction duration	Alterations	Impact
		corresponding footpath on the other side of the road would remain open.	
Darley Road civil and tunnel site (C4)	Medium term (4 years)	· Temporary closure of the footpath on the northern side of Darley Road at Leichhardt, between around Canal Road and Darley Road, may be required. This would be most likely to occur during site establishment works · The footpath along the southern side of Darley Road would remain open at all times, and would act as an alternative to the northern footpath during temporary closures · There is an on-road cycle route on Darley Road at Leichhardt that connects to the Lilyfield Road commuter route via City West Link/James Street intersection. No diversions would be required. · Traffic management measures would be implemented at the entry and exit driveways to manage potential interactions between construction traffic and pedestrians and cyclists · The project would not affect the existing pedestrian path that runs along the southern side of City West Link and connects the Leichhardt North light rail stop with Charles Street at Lilyfield (via the bridge over City West Link) · Increased interactions are likely between construction vehicles and pedestrians using the northern footpath along Darley Road between Charles Street and City West Link and cyclists using the on-road cycle route along Darley Road.	Reduced safety and amenity
Rozelle civil and tunnel site (C5), The Crescent civil site (C6), Victoria Road civil site (C7)	Medium term (4 years)	Victoria Road and Lilyfield Road to Anzac Bridge (east-west): · The existing connection between the eastern side of Victoria Road and Anzac Bridge would be maintained during construction. This connection may be temporarily realigned · Periodic closures of the footpath on the southern side of Lilyfield Road between around Lamb Street at Lilyfield and Victoria Road at Rozelle. The footpath along the northern side of Lilyfield Road would not be affected by the project · The Victoria Road pedestrian and cycle bridge would be removed, with alternative routes established before closure of the bridge · Connections between the Anzac Bridge and the western side of Victoria Road would be provided via an underpass below Victoria Road and into the Rozelle Rail Yards. A ramp would connect the Rozelle Rail Yards with the western side of Victoria Road and Lilyfield Road · Periodic, short-term closures of the shared path on the eastern and western side of Victoria Road may be required. Where this is the case, the shared path on one side of the road would be maintained.	Diversions

Construction compound	Construction duration	Alterations	Impact
		Victoria Road to The Crescent (north-south): · Pedestrian and cycle bridge spanning City West Link to be removed, with alternative routes established before closure of the bridge · The existing at-grade connection between the western side of Victoria Road and The Crescent would be retained with a ramp connecting up to Lilyfield Road and Victoria Road · The Anzac Bridge to Somerville Road to James Craig Road connection would be retained.	Diversions Reduced safety
		The Crescent and Bayview Crescent: · Pedestrian and cyclist access around Rozelle Bay would be retained with only minor alterations · Periodic, temporary closures of the footpath on the eastern and western side of The Crescent at Annandale between City West Link and Johnston Street during construction. Works would be staged so that one of the shared paths on either side of The Crescent would remain open at all times · At-grade, signalised crossing of The Crescent at the intersection with City West Link would be retained during construction · A temporary connection between Rozelle Bay and the Rozelle Bay light rail stop would be provided for pedestrians · Connections between Whites Creek shared path and Rozelle Bay (through Buruwan Park) to be diverted via Bayview Crescent and Johnston Street, crossing at The Crescent/Johnston Street existing intersection.	Increased travel distance and difficulty
Iron Cove Link civil site (C8)	Medium-long term (5 years)	Victoria Road (southern side): · Temporary closure of shared path between Springside Street and Byrnes Street · Pedestrians and cyclists temporarily diverted via Byrnes, Manning, Callan, McCleer and Springside streets (additional 400m diversion) · Connection to the Bay Run and Iron Cove Bridge (westbound) altered but retained. Victoria Road (northern side): · Shared path on northern side of Victoria Road maintained · Connection to the Bay Run and Iron Cove Bridge (westbound) retained.	Increased travel distance and difficulty
Pyrmont Bridge Road tunnel site (C9)	Medium term (4 years)	· No requirement for diversions · Increased construction vehicle interactions for pedestrians using the northern footpath along Parramatta Road and southern footpath along Pyrmont Bridge Road.	Reduced safety

Construction compound	Construction duration	Alterations	Impact
Campbell Road civil and tunnel site (C10)	Medium-long term (5 years)	· Delivery of the New M5 project would include construction of a separated cycle path along Campbell Road (by 2020) · Increased interactions between construction vehicles and pedestrians and cyclists using shared path on the southern side of Campbell Road. Interactions would be minimised due to signalised intersection being provided as part of New M5 project.	Reduced safety

The majority of diversions, listed in **Table 7-1,** do not result in significant changes from the existing pedestrian and cyclist network connections. There are two instances where the alternative active transport route would result in increased travel distance or difficulty for users. The proposed diversion on the southern side of Victoria Road at Iron Cove Link civil site (C8) and the proposed diversion between Whites Creek and Rozelle Bay via Johnston Street. These would both extend the travel distance and require users to navigate more difficult terrain than the existing routes. This may present difficulties for less capable cyclists or pedestrians with reduced mobility.

The introduction of temporary signalised crossings, delays due to construction vehicles entering and exiting sites or extended travel routes may temporarily increase pedestrian wait times and journey to work times for active transport commuters.

As identified in **Table 7-1**, the amenity, safety and subsequent user experience of pedestrian and cyclist routes around construction sites would likely be temporarily affected due to the introduction of construction activities, heavy vehicles and construction traffic into the local environment. This has the potential to result in:

- An increase in the amount of uneven surfaces (due to cracks and pot-holes in the existing roads and pavements from construction vehicles or activities) or construction debris (nails, soil runoff etc.) on pedestrian and cyclist routes, which may increase trip hazards and injuries, travel times (if tyre punctures occur) or reduce the appeal of the route
- Reduced local amenity due to construction activities producing noise and dust
- Reduced surveillance and sightlines, increased potential for entrapment spaces and increased instances of anti-social behaviour (eg graffiti) due to construction hoarding and facilities
- Increased pedestrian/cyclist conflicts with vehicles.

While the opportunity to walk or cycle in the study area would be maintained, the alterations and changes may detract from the experience of the pedestrian and cyclist environment and potentially deter people from enjoying an active lifestyle or feeling connected with their community. Depending on the length and terrain of alternate routes, some people may elect to take a shorter, less safe option (eg on active public roads), rather than detouring along a recommended detour route.

As identified in the existing environment **section 5.5.2**, eight per cent of the population across the study area currently walk to work and three per cent cycle. Any alterations to commuter-oriented networks would therefore affect the commute efficiency and connectivity for over a tenth of the population living in the study area and others that pass through the study area on their daily commute.

Changes would also affect popular recreational pedestrian and cyclist paths in Rozelle and Glebe such as the Bay Run and the Glebe Foreshore walk. These paths are heavily used by both locals and visitors from outside these suburbs. The potential impacts are only minor with access maintained throughout the construction period.

A CTAMP would be prepared as part of the Construction Environmental Management Plan (CEMP). This plan would aim to reduce the extent of impacts outlined and identify and refine safe routes for pedestrians and cyclists during construction. It is recommended that this plan incorporate:

- Specifications around the standards of pedestrian and cyclist environments (around construction sites and on alternate routes) that include provisions around lighting, surveillance, safe accesses

near construction compounds, graffiti management, avoidance of entrapment spaces, good sightlines and other crime prevention through environmental design elements

- At regular stages of construction, roads, footpaths, shared pathways as directly affected by the project would be subject to 'make good' provisions, particularly in the case of changes that affect public safety
- Provisions to ensure pathways are maintained in good condition and are clear of debris
- Provisions that encourage the maintenance of access for all levels of mobility, as far as practical
- Information regarding alternative travel routes including the difficulty of terrain, the additional distances and the duration of time detours would be in place
- Construction signage clearly identifying the detour route, its intended duration and location of alternative crossing if applicable.

Overall, construction of the project would directly affect the pedestrian and cyclist environment. The impacts would affect pedestrian and cyclist network users across the LGA. Changes would be medium term and reflect a small change to the existing baseline environment. The consequence of the impact would be slight, with a high likelihood of these effects occurring. As such, the overall impact on the socio-economic environment would be minor negative.

7.2 Local amenity

Amenity has its meaning of pleasantness, but also has a physical (or tangible) component. This includes the character and appearance of buildings, proximity to commercial or recreational facilities, quality of infrastructure and absence of noise, unsightliness or offensive odours. It also has a psychological or social component[34].

Changes to local amenity may affect the ability of a resident, a visitor or the community to enjoy or undertake activities (eg hanging washing outdoors, opening windows, enjoying walks) within their residential property or local area. During construction, the following may affect local amenity:

- The removal of established vegetation
- The introduction of construction facilities to the environment, affecting views
- Light spill from night-time construction works
- Noise, vibration, dust arising from construction activities
- Unpleasant odours
- Increased traffic volumes and/or congestion.

Concerns regarding impacts on local amenity were raised during community consultation. During construction, impacts on local amenity are generally contained within close proximity of construction activities and compounds. The following section details the impacts on local amenity that would affect the residents and the broader community as a result of construction.

The sensitivity of an individual resident to amenity impacts would vary depending on their physical or psychological attributes, their living situation, or how they use their place of residence or neighbouring areas. For instance, some individuals are light sleepers and may have difficulty sleeping if noise impacts occur during the evening. Alternatively, a person may work or study at home, which would expose them to a longer duration of construction impacts compared to a person that is employed elsewhere.

Construction effects on the amenity of businesses are discussed in **section 7.9** and social infrastructure in **section 7.10**.

[34] Victorian Government Solicitors Office, 2008, What is "amenity": Planning and Environmental Law, viewed on 26th June 2017, http://www.vgso.vic.gov.au/sites/default/files/publications/What%20is%20amenity.pdf

7.2.1 Noise and vibration

Noise and vibration arising from construction activities has the potential to affect local amenity. Construction activities have the potential to generate high noise levels that may affect the ability to enjoy a place, human health and wellbeing, daily routine, employee productivity, the ability to communicate and interact, and the ambience of social infrastructure and workplaces generally.

Appendix J (Technical working paper: Noise and vibration) of the EIS found that construction activities would generate an exceedance of noise levels for some nearby sensitive receivers at all construction compound locations. Construction activities may also generate vibration effects above human comfort levels in some locations.

Noise

The construction of the project would generate considerable noise, with the highest noise exceedances generally experienced at the first row of receivers (buildings) to construction sites.

Across the majority of construction areas, the highest noise level exceedances are predicted during pavement and infrastructure works, which require the use of concrete saws and/or rock breakers. These works are generally temporary (two weeks) and intermittent (only when concrete saws or rock breakers are in use). These works are likely to be required both within and outside of standard working hours. The demolition of existing buildings (24 weeks duration), utility works (24 weeks duration) and roadworks (192 weeks duration) are also likely to affect a high number of receivers. The operation of laydown areas across the study area are expected to generate noise exceedances and potentially disrupt night-time amenity. The operation of laydown areas would extend for a longer duration (up to 132 weeks).

Daytime noise impacts

Table 7-2 outlines the maximum number of receivers that may be affected during any day-time construction activity as a worst-case scenario. These figures are indicative only and are based on the current design which would be further refined during the detailed design stage. The noise modelling does consider the implementation of standard mitigation measures including scheduling of activities during normal working hours, acoustic sheds, noise walls and planned construction traffic movements. Where the exceedance is greater than 11 dBA, some community reaction to noise may be expected. It must be noted that the most noise intensive construction works that result in the greatest number of exceedances at receivers are anticipated to be relatively short term (around two weeks).

Table 7-2 Maximum number of receivers that may be affected by daytime construction noise impacts

Construction site	Number of receivers		
	Highly noise affected[35] (residential receivers >75 dBA)	Daytime (>11 dBA exceedance – all receivers)	Daytime (out of hours) (>11 dBA exceedance – all receivers)
Haberfield Option A (C1a, C2a, C3a)	5	13	24
Haberfield Option B (C1b, C2b, C3b)	13	49	72
Darley Road (C4)	36	59	101
Rozelle (C5)	29	40	16
The Crescent (C6)	0	6	0
Victoria Road (C7)	20	29	0
Iron Cove Link (C8)	53	91	97
Pyrmont Bridge Road (C9)	6	18	19

[35] *Based on ICNG definition (ie predicted $L_{Aeq(15minute)}$ noise at residential receiver is 75 dBA or greater).*

Construction site	Number of receivers		
	Highly noise affected[35] (residential receivers >75 dBA)	Daytime (>11 dBA exceedance – all receivers)	Daytime (out of hours) (>11 dBA exceedance – all receivers)
Campbell Road (C10)	0	0	0

The **Appendix J** (Technical working paper: Noise and vibration) of the EIS does however identify 177 properties that would be highly noise affected during day-time construction and would require additional treatments to minimise daytime noise impacts (based on current design). The specific location of receivers requiring further mitigation may be found in Annexure H of **Appendix J** (Technical working paper: Noise and vibration) of the EIS. Additional mitigations include ongoing notification and verification.

Social infrastructures facilities may be particularly sensitive to health and amenity impacts associated with noise exceedances eg health and aged care facilities, childcare and educational facilities, places of worship and active and passive open space. During the worst case construction activities (ie during high noise generating activities) the following facilities are anticipated to experience noise exceedances:

- Place of worship - Kingdom Hall of Jehovah's Witnesses at 12 Wattle St, Haberfield
- Childcare - The Infants Home at 17 Henry St, Haberfield
- Education facility - Yasmar training facility at 185 Parramatta Rd, Haberfield
- Childcare - Chaya's Family Day Care at 12/111 Alt Street, Ashfield
- Childcare - Nurjahan's Family Day Care at 12a/115 Alt Street, Ashfield
- Childcare - Explore and Develop at 372 Norton Street, Lilyfield
- Childcare - Billy Kids learning at 64 Charles St, Lilyfield
- Childcare - Rosebud Cottage Child Care Centre at 5 Quirk Street, Rozelle
- Recreation Easton Park Playground, Lilyfield Road, Rozelle
- Rozelle Public School at 663 Darling St, Rozelle.

Appendix J (Technical working paper: Noise and vibration) of the EIS identifies a number of additional mitigation measures to be implemented that would reduce noise impacts on receivers as well as the number of potentially highly affected properties. These include increasing the height of site hoarding, upgrading the acoustic shed performance and limiting the total sound power level of equipment operating within the acoustic sheds to 110 dBA. With implementation of these additional measures, the extent of impact on daytime receivers (outlined in **Table 7-2**) would be reduced, with the majority of receivers experiencing very low or no noise impacts during daytime activities.

Where noise effects cannot be mitigated there is the potential for adverse impacts upon the socio-economic environment. Noise impacts may also affect the way people utilise space, their ability to communicate and the way individuals undertake daily activities. This includes heightened annoyance, stress and sleep disturbance. This would be particularly felt by people that work from home, shift workers, the elderly or households with young children that are more dependent on quieter environments to work, rest and relax. As identified in **section 5.1**, health care and social assistance was one of the top three resident employment industries across all precincts. This industry generally employs a large proportion of their workforce under shift work arrangements. Considering this, there is a high chance of the study area containing a higher numbers of shift workers that rely on a quieter environment during the day to rest and recuperate.

To assist in reducing the cumulative effect of utility works and project works, it is proposed that a Utility Co-ordination Committee be established to ensure better planning and co-ordination of utility works. This would include coordination between different works being undertaken as part of the M4-M5 Link project as well as those associated with other projects.

Although intermittent, the duration of impact would be medium term concentrated at a locality level. The severity of impact would be a medium alteration from the baseline conditions; considering

existing surrounding daytime urban noise levels. The severity of impact would however dissipate the further the receiver is from the site. The likelihood of impact to receivers in the immediate locality would be near certain. The likelihood of impact would also reduce the further the receiver is from the site. With consideration of all of these factors, the overall significance of impact on the day-time socio-economic environment would be minor negative.

Night-time noise impacts

High levels of construction noise at night may interrupt sleep patterns with consequential impacts upon health and well-being. As identified in **Appendix K** (Technical working paper: Human health risk assessment) of the EIS, ongoing sleep disturbance may affect an individual's creativity, performance, memory, concentration, risk-taking behaviour and risk of accidents. This may have secondary effects on the socio-economic environment such as a reduction in employee productivity (affecting business operation and revenue) and student performance at school.

The severity of noise level exceedance varies across the study area, depending on proximity to construction sites and associated noise levels. As background noise levels are lower during night-time periods, the potential impact of construction activity on the amenity of night-time environments may be greater.

Table 7-3 outlines the maximum number of receivers that may be affected during night-time construction activity as a worst-case scenario, without additional mitigation. These figures are indicative only and are based on the current design which would be further refined during the detailed design stage. The noise modelling undertaken for the project does consider the implementation of standard mitigation measures including scheduling of activities during normal working hours, acoustic sheds, noise walls and planned traffic movement. It must be noted that the most noise intensive night-time construction works, including pavement and infrastructure works, line marking and utility adjustments generate the greatest number of exceedances (as reflected in the below table), however these are anticipated to be of short duration (around two weeks).

Table 7-3 Maximum number of receivers that may be affected by night-time construction noise impacts

Construction site	Number of receivers			
	Highly noise affected residential receivers	Evening (>11 dBA exceedance – all receivers)	Night-time (>11 dBA exceedance – all receivers)	Potential sleep disturbance (>11 dBA exceedance)
Haberfield Option A (C1a, C2a, C3a)	5	29	162	148
Haberfield Option B (C1b, C2b, C3b)	7	72	214	177
Darley Road (C4)	36	159	382	371
Rozelle (C5)	0	28	265	602
The Crescent (C6)	0	0	14	3
Victoria Road (C7)	0	0	0	0
Iron Cove (C8)	22	146	253	238
Pyrmont Bridge Road (C9)	4	14	26	60
Campbell Road (C10)	0	0	1	0

Night-time amenity would be affected by several proposed construction activities. As defined in the **Appendix J** (Technical working paper: Noise and vibration) of the EIS, the Noise Catchment Areas (NCA) that are subject to the greatest impacts during night-time construction works and require additional mitigation treatments include those:

- Adjoining the Haberfield construction site in NCA03 to the north (along Wattle Street to the east of Ash Lane) and NCA06 to the south (along Walker Ave to the south) and opposite the construction site in NCA01 (near Page Ave and Earle Ave)
- Adjoining the Darley Road construction site in NCA09 to the north (including the southern end of Hubert Street and Francis Street in Lilyfield) and NCA13 to the south (including the northern end of Charles Street, North Street, Hubert Street, Francis Street and James Street)

- Adjoining the Rozelle construction site west of The Crescent in NCA21 (along Bayview Crescent and Railway Parade), north of the construction site in proximity to Victoria Road in NCA25 and NCA29 (including sections of Lilyfield Road, Hornsey Street, Quirk Street and Robert Street) and to the south of the construction site near White Creek in NCA20
- Adjoining the Iron Cove Link construction site north and south of Victoria Road in NCA33, NCA34 and NCA36
- Adjoining and opposite the Pyrmont Bridge construction site in NCA41 (north along Pyrmont Bridge Road), NCA44 (along Layton Street) and in NCA42 between Denison Street and Australia Street.

Mitigation measures would need to be tailored to each household's individual situation, with suitable mitigation measures being developed in collaboration with each during detailed design and project construction. A suitably qualified and experienced acoustic advisor would monitor activities and make recommendations to avoid or minimise the extent of impacts.

Noise impacts upon specific social infrastructure and business receivers are discussed in **section 7.10**.

The primarily residential areas around the Haberfield, Darley Road, Rozelle and Iron Cove Link construction sites are expected to be the most affected by high night-time noise exceedance impacts. For front row receivers, immediately adjoining or adjacent construction sites, night-time noise exceedances would be near certain, however the potential severity of impact would recede moving away from the construction site.

Although intermittent, the duration of impact would be medium-long term concentrated at a locality level. The severity of impact would be a large alteration to the baseline conditions. The consequence and likelihood of impact on receivers in the locality would be significant and near certain. The likelihood and consequence of impact would however dissipate to moderate and possible the further the receiver is from the site. With consideration of all of these factors, the overall impact on the socio-economic environment would be moderate negative.

Ground borne noise impacts

As the project involves tunnelling, ground-borne noise impacts may be experienced during construction. Ground borne noise is only likely to be an issue where tunnelling occurs at depths of less than 30 metres below ground. Across the majority of the alignment, the tunnel depths are in excess of 30 metres. The areas less than 30 metres in depth occur where the tunnels are approaching the surface at:

- Wattle St, Haberfield near Martin and Waratah streets
- Rozelle, near Lamb, Justin, Alfred, Burt and Denison streets and Lilyfield Road
- Rozelle near Callan, Springside and Moodie streets
- St Peters, near Crown Street.

Considering the roadheader works would be progressing at a rate of around 20 metres per week, it is anticipated that ground-borne noise impacts would only be experienced for a short duration at any one location. Roadheader technology, compared to tunnel boring machines, generates less ground borne noise and vibration. Tunnelling works would however occur 24 hours a day, seven days a week with worst-case predictions primarily affecting residential receivers.

Appendix J (Technical working paper: Noise and vibration) of the EIS indicated that without mitigation, potential noise exceedances would occur at up to 456 residential properties. NCA24 to the north of the Rozelle construction site and east of Victoria Road is predicted to experience the greatest number of ground-borne noise exceedances (159 receivers). One social infrastructure sensitive receiver is located in this noise catchment and two in NCA42. No commercial receivers are anticipated to be affected by ground-borne noise exceedances.

Similar to airborne noise effects, ground-borne noise impacts may affect the amenity of an environment and reduce the capacity to enjoy a space, concentrate, sleep or communicate. This may elevate stress levels and lead to sleep disturbance and reduced productivity.

The following mitigation measures would be considered where feasible and reasonable:

- Validation of predicted ground-borne noise levels (note that this may not be required where the ground-borne noise impacts would last less than three weeks at any one sensitive receiver and should be confirmed at a later design stage)
- Notification letterbox drops to receivers in the area around the works location, detailing work activities, time periods over which these would occur, impacts and mitigation measures
- Specific notifications provided to receivers where the ground-borne noise levels are predicted to exceed the night-time thresholds.

Although tunnel activities would be medium-long term, the duration of impact at any one receiver would be short term. The severity of impact would be a small alteration to the baseline conditions. The likelihood of impact to would be possible and the consequence of impact slight. With consideration of all of these factors, the overall impact on the socio-economic environment would be minor negative.

Construction traffic noise impacts

Construction traffic also has the capacity to result in noise impacts on local amenity. In most cases, construction traffic is unlikely to significantly increase due to the relatively high existing traffic volumes on roads.

The presence of construction traffic would last for a medium-long duration, would affect an LGA extent, however would have no discernible change to the baseline noise condition. The consequence of construction noise is neutral, with a low likelihood of occurrence. As such, the significance of construction traffic noise on the socio-economic environment is negligible.

Airborne noise impact summary

Overall, the presence of construction noise would result in a medium change from the existing environment. These impacts would generally respond to management and mitigation measures. The incorporation of noise barriers, acoustic sheds and other standard and additional mitigation measures would assist in alleviating the extent of impact on local amenity and the socio-economic environment.

Assuming the suggested additional mitigation measures outlined in **Appendix J** (Technical working paper: Noise and vibration) of the EIS are implemented, the severity of impacts on receivers would be reduced. The implementation of the Community Communication Strategy that continues to inform and notify residents and businesses about potential noise exceedances and the anticipated duration of these activities is recommended. This would assist in reducing annoyance, anxiety and stress regarding the noise exceedances, as individuals would feel more informed and know that the impact has an end date.

Noise effects on local amenity would be intermittent in nature however would extend for a medium-long duration. The severity of impact on individual receivers would vary depending on their proximity from the construction sites. The severity of impact would be significant and highly likely at a locality level resulting in a large alteration to the baseline conditions. The likelihood and consequence of impact would however dissipate the further the receiver is from the construction site. With consideration of these factors, the overall impact on the socio-economic environment would be moderate negative.

Vibration

Surface work construction activities such as bored piling, jackhammering, rock-breaking and work associated with tunnelling have the potential to generate vibration. **Appendix J** (Technical working paper: Noise and vibration) of the EIS) measures the impacts of vibration against two criteria, cosmetic damage and human comfort.

Cosmetic damage

The operation of large rock-breakers has the potential to generate some of the most substantial construction vibration impacts. Generally, the separation distances between the proposed works and the nearest receiver(s) would be sufficient to prevent cosmetic damage, though in some circumstances there may be instances where vibration-generating construction activities are required to be undertaken within the minimum working distance where cosmetic building damage may occur.

The assessment identified that up to 229 buildings in the vicinity of works may be within the minimum working distance of vibration intensive equipment under these scenarios.

Households, businesses and social infrastructure providers that are identified as being within the minimum working distance for potential cosmetic damage may experience heightened levels of stress and anxiety during construction activities. This may be caused through the uncertainty of duration for impacts and concern for their properties. Property owners potentially affected by tunnelling activities (within an identified distance to tunnelling alignment) would be offered pre and post condition surveys. If any cosmetic damage did arise due to construction activities, the contractor would need to assess and 'make good' any damage.

Appendix U (Technical working paper: Non-Aboriginal heritage) of the EIS determined that 25 heritage listed items have been identified as having the potential to be within the minimum safe working distances should a large rock-breaker be used at the outer extents of the project footprint. Potential vibration impacts on heritage items would be managed in accordance with the recommendations of **Appendix J** (Technical working paper: Noise and vibration) of the EIS. As the conservation and protection of heritage items is a value held highly by the community, any cosmetic damage to these items would be a concern. A suitably qualified and experienced acoustic and vibration advisor would be engaged during the construction period to monitor vibration and ensure management measures are effectively applied.

Cosmetic damage vibration effects would be confined to localities, would be intermittent and would be short term. During worst-case situations, the change from the baseline condition would be large. The likelihood of the worst case situation occurring would be low. The consequence of socio-economic effects would be moderate. With consideration of these factors, the overall impact on the socio-economic environment would be minor negative.

Human comfort

As identified in **Appendix J** (Technical working paper: Noise and vibration) of the EIS, people may observe vibration levels well before those likely to cause damage to building contents or affect the structural integrity of buildings. These vibrations would affect human comfort with people potentially inconvenienced or possibly disturbed by the vibrations. This may elevate a person's stress and anxiety levels. These vibration effects may also effect businesses, particularly those that require concentration or precision operations such as optometrists, medical equipment (eg x-rays), or fine detail machinery (eg laser printers).

Across the study area, 676 receivers would fall within the nominated minimum working distance for human comfort vibration. This is, however, a worst-case scenario and it is unlikely that all receivers would be affected by human comfort vibration impacts with the proposed mitigation and management measures in place.

Impacts upon human comfort would be intermittent across the duration of the project and would only occur over short periods (generally up to one week at any one location). The effects on the socio-economic environment of disturbances to human comfort level are likely, however would be small and confined to receivers in the locality. Although vibrations effects may cause annoyances and in some instances human discomfort, the consequence on the socio-economic environment would be slight. With consideration of these factors, the overall impact on the socio-economic environment would be minor negative.

Vibration summary

Vibration impacts are likely to respond well to mitigation measure proposed in the EIS. These would include the implementation of a Construction Noise and Vibration Management Plan (CNVMP) and ongoing consultation with the community as part of the Community Communication Strategy.

Although a large number of people may experience vibration, the implementation of mitigation measures would reduce the likelihood of cosmetic damage effects. The roadheader also moves through the tunnel at a rate of 20 to 25 metres per week, so the potential effects on individual receivers would be short-term.

Vibration effects on local amenity would be intermittent in nature and short-term at any particularly receiver. The severity of impact on individual receivers would vary depending on the proximity from

the vibration source. The severity of impact would be a medium change from the baseline condition. The likelihood of effect would be possible at a locality level resulting in a moderate consequence. The likelihood and consequence of impact would however dissipate the further the receiver is from the construction site. With consideration of these factors, the overall impact on the socio-economic environment would be minor negative.

7.2.2 Changes to visual amenity

Visual amenity may be described as the pleasantness of the view or outlook of an identified receptor or group of receptors (eg residences, recreational users). Visual amenity is an important part of an area's character and offers a wide variety of benefits to the community in terms of quality of life, wellbeing and economic activity.

During construction, visual amenity throughout the study area has the potential to be affected by factors such as the removal of established vegetation, the installation of construction hoardings, installation of acoustic sheds, construction equipment and/or the visual appearance of construction sites. Other factors may include the alteration of view corridors to heritage items or places, open space, water bodies or the city skyline. **Appendix O** (Technical working paper: Landscape and visual impact) of the EIS provides an assessment of the visual impacts associated with the construction of the project.

During construction, extended disturbances to visual amenity may affect the enjoyment of an environment, business revenue (**section 7.9**) and human health and the well-being of individuals (**section 7.4.2**). The sensitivity of receptors to visual changes and the overall variance in the receiver's outlook is also relevant in determining the significance of impacts. In some instances, residential views or in other instances, privacy is affected due to the removal of vegetation. **Appendix O** (Technical working paper: Landscape and visual impact) of the EIS assessed the magnitude of these changes and has deemed the overall landscape character and visual impact of the whole project during construction to be moderate to high.

Changes to visual amenity during construction of the project, would be expected to affect the socio-economic environment. The level of impact may alter the way people use space, the value of a property or its subsequent rental return or the appeal and function of businesses or social infrastructure.

Residents likely to experience substantial visual impacts are those that have views of the construction sites, acoustic sheds and ancillary construction infrastructure from internal and external living spaces. Residential properties expected to experience visual impacts include residents along:

- Northcote Street, Wattle Street, Walker Avenue and Ramsay Street, Haberfield – visual impacts from construction infrastructure (Option A). There are already construction sites for the M4 East at this location. Although the visual impacts would not substantially change from the existing use as a construction site, the ongoing use of these sites introduces construction fatigue risks with these residential properties likely to be more sensitive to ongoing impacts
- Alt Street, Bland Street and Parramatta Road, Haberfield – visual impacts from construction infrastructure (acoustic shed), loss of solar access to a number of adjoining residential properties and the removal of two rows of trees (Option B). These impacts would only occur if the Option B outcome progresses instead of Option A. There is also an existing construction site adjoining this location with the capacity to introduce construction fatigue risks
- Darley Road, Charles Street, Hubert Street (south of Darley Road), Francis Street (south of Darley Road) and James Street, Leichhardt – visual impacts from construction infrastructure, machinery and equipment and the increase in construction traffic using Darley Road and the construction of the motorway operations complex
- Foucart Street and Cecily Street, Rozelle – visual impacts from the removal of trees along sections of Lilyfield Road resulting in direct views to the construction fencing and hoarding and larger elements of the construction site such as the acoustic shed and ventilation facilities
- Lilyfield Road near Denison Street, Rozelle - visual impacts from the removal of the majority of mature trees on Lilyfield Road (adjoining the norther boundary of the Rozelle civil and tunnel site (C5)), which would provide direct views to fencing and hoarding, and larger elements of the

construction site. Some residences may experience an alteration of views out across the city due to the installation of the acoustic shed, construction machinery and equipment and ventilation facility

- Bayview Crescent and Johnston Street, Annandale - visual impacts from the removal of some mature trees within the project footprint and the construction of the pedestrian bridge, which would result in some residences experiencing a permanent alteration in views to Rozelle Bay
- Hornsey Street and Quirk Street, Rozelle – the existing commercial building with shop top housing would be demolished and replaced with temporary site offices, laydown areas, car parking, fencing and hoarding. Neighbouring properties would have both direct and extensive views to the Victoria Road civil site (C7)
- Callan, Springside, Toelle and Clubb streets, Rozelle - visual impacts from the demolition of existing buildings along Victoria Road which would expose a number of residential properties to both Victoria Road and construction elements including temporary noise barriers and hoarding, construction machinery and equipment, and the construction of the portals, ventilation facility and substation
- Pyrmont Bridge Road, Annandale – visibility of the construction site, ancillary works and construction traffic would be high for residents within close proximity. Residents adjoining or adjacent to the site would have views of the noise walls, acoustic shed, fences and hoardings
- Booth and Mallett streets, Annandale – two 15-storey apartment buildings are located near the construction site on the northern and southern sides of the intersection of Booth and Mallett streets. Both buildings have balconies and windows that overlook the site with direct views of construction infrastructure, noise walls, acoustic shed, fences and hoardings
- Campbell Road, St Peters – residential properties at the eastern end of Campbell Road would have visibility to fencing/hoarding and large construction elements including the acoustic shed and ventilation facility and associated infrastructure. Although residents already overlook the New M5 construction site and the visual impacts would not substantially change from the existing environment, the ongoing use of these sites introduces construction fatigue risks with these residential properties likely to be more sensitive to ongoing impacts
- Barwon Park Road and Campbell Street, St Peters – residents would have visual impacts from views of an acoustic shed, ventilation facility and associated infrastructure. Although residents already overlook the New M5 construction site and the visual impacts would not substantially change from the existing environment, the ongoing use of these sites introduces construction fatigue risks with these residential properties likely to be more sensitive to ongoing impacts.

These impacts would affect the appeal of external and internal living spaces and reduce the overall amenity of an environment. Residential properties that have the amenity of their living and entertaining spaces reduced may be less inclined to entertain or interact with other household members as the appeal or privacy has declined. The removal of trees and the introduction of construction sites would reduce the privacy of some properties and reduce screening of construction activities. The introduction of temporary or permanent infrastructure may also affect the value of the property or the ability for the property to be rented, without a rent reduction, during the construction period. This would have both financial and social consequences on households.

The pedestrian and social infrastructure environments are also expected to be affected by visual impacts associated with the project. High (or high-moderate) visual impacts have the potential to reduce both the amenity and perceived safety of an area and may result in people avoiding open spaces or pedestrian footpaths. This could influence the amount of time people spend outdoors exercising or enjoying public spaces and may trigger a reduction in community cohesion and social interaction. Areas expected to experience high or high-moderate visual impacts include the following:

- Large areas of Easton Park which would have unimpeded views of the construction site including the construction hoardings and other facilities that extend above the hoardings
- Glebe Foreshore Parklands, where views would be altered by construction works extending around the western end of Rozelle Bay from The Crescent to Anzac Bridge.

The effects on business from changes to visual amenity would be dependent upon on the nature of the business and its dependency on amenity and aesthetics. For example, pleasant views and vistas

may attract customers to a restaurant, however a smash repairs is unlikely to be effected by view alterations. As such, the impact on business revenue would vary. Business impacts are discussed in more detail in **section 7.9**.

Night-time construction works are likely to affect residential amenity. In particular, residential areas around the tunnelling sites are likely to experience high or high-moderate night-time visual impacts. This includes construction lighting impacts due to the operation of the construction sites for 24 hours a day. Although lighting would be designed to minimise light spill, residual impacts upon local amenity and sleep disturbance may occur.

Some visual impacts likely to occur during construction are less likely to respond to mitigation measures. This would include some long-term impacts such as the removal of mature vegetation. This would result in inevitable adverse impacts upon the overall visual amenity of an area.

It is recommended that construction hoardings around project sites are of high visual quality and are used to convey key project information and expected timeframes.

Visual impacts on local amenity would be medium-long term in nature. The severity of impact on individual receivers would vary depending on the proximity from the construction site. The severity of change from the existing environment would be medium and generally confined to locality level. Construction effects would result in a moderate alteration to the baseline conditions. The likelihood of the impact occurring is possible and of a moderate consequence. With consideration of these factors, the overall impact on the socio-economic environment would be moderate negative.

7.2.3 Changes to air quality

Construction activities such as demolition, earthworks, construction and track-out activities have the capacity to increase dust, air emissions and odour. This has the potential to affect human health, reduce the amenity of an area and generate nuisance dust impacts due to the increase in dust deposition (dust soiling) potentially deterring people from using spaces, visiting businesses or enjoying residential amenity.

The dissemination of unpleasant odours is not anticipated during construction as no landfilled areas require excavation or disturbance. Any unexpected finds (eg localised contamination etc.) would be dealt with in the Construction Air Quality Management Plan in relation to odour. The anticipated impact of odour on the socio-economic environment is likely to be negligible.

An assessment of the impacts of construction traffic has been undertaken in **Appendix I** (Technical working paper: Air quality) of the EIS. The assessment determined that exhaust emissions from on-site plant and site traffic would be unlikely to have a significant impact on the local air quality and was not further assessed in the report.

Air quality from construction activities, including spoil haulage and construction traffic was identified as a significant concern during public consultation. An increase in dust as a result of the project would adversely affect human receptors and the function and operating costs of businesses. Nuisance dust generated from construction activities commonly affects dwellings through soiling. This may reduce the cleanliness of an environment and would require residents to spend more time cleaning, which are an annoyance and an additional household expense. Higher levels of dust in residential properties would also potentially heighten the incidence of allergies, asthma and other respiratory issues.

Construction dust would also affect other sensitive premises that require a cleaner and/or sterilised environment, such as food service, manufacturers and processing, electronic manufacturers, vehicle showrooms and medical practitioners. Increased dust on and around social infrastructure, particularly active recreation spaces, would also reduce the capacity of the community to enjoy the environment and/or may increase health risks for participants. This would be a particular concern for community members and visitors with respiratory and health issues such as asthma and allergies.

Appendix I (Technical working paper: Air quality) of the EIS assessed the risk of construction dust impacts, assessing the potential for construction activities to generate dust and the sensitivity of the area (proximity and number of receptors) to dust. The high-risk assessment in this appendix indicated potential impacts on sensitive receivers around:

- Compounds C1a, C2a and C3a (Options A and B) which may generate dust soiling from track-out activities
- Compounds C1b and C3b (Option B) which may generate dust from the demolition of existing buildings
- Compound C4 which may generate dust soiling and human health effects during demolition and dust soiling during track-out activities
- Compounds C5, C6 and C7 which may generate dust soiling during all construction activities and human health effects during demolition
- Compound C8 which may experience dust soiling during earthworks, the demolition of buildings and construction
- Compound C9 which may generate dust soiling from all construction activities and human health effects during demolition
- Compound C10 which may generate dust soiling from earthworks, construction and track-out.

Mitigation measures to manage dust would be incorporated into the Construction Air Quality Management Plan. On this basis, the residual impact of dust on local receptors was deemed in the air quality impact assessment to be low. As construction dust generation is influenced by weather conditions, there is a risk that nearby receptors may still experience some occasional dust soiling impacts, despite mitigation measures being in place. These would be temporary and short-lived.

Demolition of buildings has a greater capacity to trigger human health impacts due to the potential release of asbestos fibres, heavy metals, or fungal spoils during the demolition of certain buildings or objects. **Appendix I** (Technical working paper: Air quality) of the EIS, however, considers a worst-case scenario and deems that significant impacts on human health may generally be avoided or minimised through appropriate and commonly applied mitigation measures.

As construction dust impacts may generally be managed through appropriate mitigation measures, the changes in air quality as a result of the project would likely be small. There may be a higher likelihood of nuisance dust at a locality level around construction compounds on dry weather days with the wind blowing towards a receptor. Any effects would be temporary and short-lived, with the significance of impact on the socio-economic environment negligible.

7.3 Property acquisitions

The nature of direct property impacts, including details of property acquisitions, temporary occupation of land and settlement and subsidence impacts are detailed in **Chapter 12** (Land use and property) of the EIS. This section identifies the socio-economic consequence of these direct property acquisitions on residential properties, businesses and social infrastructure.

The project would predominantly be a sub-surface project, with the mainline tunnel running from Haberfield through to St Peters and the majority of the Rozelle interchange being underground. The project has been designed to minimise the need for surface property acquisition. This has been done by:

- Locating road infrastructure in tunnels
- Where possible, using areas within the footprint of the M4 East and New M5 projects for construction activities
- Where possible, using government owned land for construction and operation of the project, including land already owned by Roads and Maritime, minimising the need for property acquisition.

In order to facilitate the project, however, a number of property acquisitions are required for:

- Construction of new structures, including tunnel portals and ventilation facilities
- Construction compounds for the operation and storage of machinery, construction activity coordination and construction parking

- Widening of existing arterial roads or construction of new motorway connections.

7.3.1 Residential

Twenty-six residential properties are proposed to be acquired as part of the project. Multiple strata titles may exist within each parent lot to be acquired.

The social risks related to land acquisition for both property owners and tenants may include:

- Inaccessibility of equivalent housing at a comparable cost. If compensation does not allow property owners and tenants to access similar housing in the local area, acquisition may result in resident's relocation to other more affordable areas or incurring increased levels of debt to remain in the area.
- Relocation health risks. Relocation may be emotionally and physically taxing process. Vulnerable members of the community, including the frail, elderly, people with a disability or poor health and those with low English language skills may be most at risk of stress and in need of support when relocation.
- Altered access to social infrastructure. If acquisition results in households needing to move to other areas, this may affect continuing access to social services, family and local social networks.

As identified in **section 5.1.2**, the proposed residential acquisitions are not within areas that are considered socially disadvantaged. These areas also have a low proportion of persons needing assistance (1.2 per cent). Fifteen per cent of the population across the precinct are however children, with acquisition potentially requiring children to move schools if families cannot relocate into the same school catchment.

These impacts may be reduced and/or managed through the application of a process of consultation and compensation that is designed to be equitable to existing property owners. As stated in **Chapter 12** (Land use and property) of the EIS.

All acquisition required for the project would be undertaken in accordance with *the Land Acquisition (Just Terms Compensation) Act 1991* (NSW), the *Land Acquisition Information Guide* (NSW Government 2014) and the land acquisition reforms announced by the NSW Government in 2016[36].

Overall, the number of acquisitions proposed to facilitate the project is relatively low for an infrastructure project of this scale. The impact upon individual residents would be major, however somewhat mitigated by the implementation of a detailed consultation and advice process, as per the abovementioned NSW property acquisition reforms. Residential property acquisitions are generally determined early in the process with property owners and tenants notified at this stage. Affected households are offered support during the acquisition process and are normally re-established in their new homes within the short-medium term.

Considering this, acquisitions would result in a short-medium term change to the existing baseline environment. The severity of change to the overall environment is medium and confined to a locality. The likelihood of these effects occurring is high, with a moderate consequence. Considering this, the overall impact of construction activities on the socio-economic environment is a moderate negative.

7.3.2 Businesses

Businesses have specific and individual needs, including but not limited to the location of the business premises, access to the business by employees and customers and the ability to deliver and receive goods and services. The acquisition of properties, including cessation of leases, and subsequent relocation or closure of businesses has the potential to result in:

- Disruptions to business operation
- Loss of revenue

[36] see: https://www.finance.nsw.gov.au/sites/default/files/NSW_Government_Response.pdf. Relocation and some other categories of expenses would be claimable under this Act

- 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 across the study area, 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 has been designed to reduce this impact.

To enable construction of the project, 24 commercial or industrial zoned properties and one mixed-use property, containing 48 businesses are required to be acquired. Businesses would need to cease operation, to either relocate to another location or permanently close. The breakdown of properties containing commercial or industrial uses by location and trade catchment is included in **Table 7-4**. Note that each property parcel may contain more than one business.

Table 7-4 Commercial and industrial acquisition requirement for the project

Location	Use (type)	No. of total property acquisitions[37]	Likely trade catchment
Parramatta Road West and East civil and tunnel sites	Mixed use	1	Local
Darley Road surface works	Commercial	1	Local
Rozelle interchange surface works	Commercial/industrial	4	District
Iron Cove Link surface works	Commercial/industrial	10	Local
Pyrmont Bridge Road tunnel site	Commercial/industrial	9	District

The magnitude of impact on the local economy from a business closing would be dependent on worker productivity, number of employees, the size of the trade catchment it serves (ie manufacturing may serve a larger catchment than a coffee shop), and the ability for the business to remain within their existing trade catchment.

Businesses required to close or relocate due to the project are predominantly light industrial or speciality services. These businesses would service a wider area and would likely employ a small number of workers. Due to the orientation of these businesses and the fixed supply of alternative industrial zoned land in the surrounding area, it is likely that these businesses would relocate to another trade catchment. This would result in relocation and establishment costs with potential loss in trade and revenue during this time for individual businesses.

The relocation or closure of businesses due to property acquisition or lease cessation would also disrupt the character of business areas and effect the productivity of local economies. The impact upon the character of these areas may be partially returned should some businesses be able to re-establish in the same location post-construction. This would most likely be seen at the Darley Road, Pyrmont Bridge Road and Parramatta Road construction ancillary facilities, which would retain future opportunities for the land to be redeveloped, post-construction, consistent with the current land zoning.

There are circumstances where a community may develop a strong tie and connection to a business and its employees, with changes affecting the business leading to disruptions to routine, social networks, and economic productivity. The loss of such ties would be a negative socio-economic impact.

[37] Note, that this column reflects the acquisition of properties that contain business uses, not the number of businesses.

The area to where a business relocates may also have different locational attributes, such as reduced passing trade or business visibility. This may result in a loss of revenue for the business or may require the business to relocate again to an alternative area, to maintain viability.

Of the businesses affected by property acquisitions, there are limited co-dependencies or synergies between those that would be acquired and those that would remain operational in the surrounding catchment. Therefore, the operation of remaining businesses would not be substantially affected by these changes. With respect to wholesale businesses along Lilyfield Road, it is noted that some of these businesses supply specialist materials that are not readily available in the surrounding area. Tradesmen and others more dependent on these businesses would be required to travel further to access similar supplies. Of the remaining businesses affected, the provision of similar goods and services remains adequate and readily available within the local area and broader catchment.

A key mitigation to reduce the severity of impact on businesses would be the implementation of the acquisition and compensation process in line with the *Determination of compensation following the acquisition of a business*[38] guideline (NSW Government, date unknown). This guideline provides direction to all NSW acquiring authorities in determining compensation for a business conducted on land that is acquired in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW). It is acknowledged in the guide that each case for business interest compensation should be considered on its individual merits. The business interest may be in the same ownership as the "land" or may be a non-related party.

A proportion of businesses required to cease operation, which provide a unique service to the broader LGA, may not be able to relocate into the same area. This would result in a potential loss of this service to the broader trade catchment. In most instances however, there would be sufficient capacity in the broader trade catchment for a business to relocate or enough similar businesses remaining within the local area.

Overall, the number of acquisitions and businesses required to cease operation to facilitate the project is relatively low for an infrastructure project of this scale. The impact upon these businesses would be somewhat mitigated by the implementation of a detailed consultation and compensation process.

Although the acquisition process is likely to be a significant change for individual businesses directly affected by the project, the compensation process should help to alleviate the severity of impact on individual business interests. In regards to the broader socio-economic environment, the business closures are anticipated have a slight effect on the baseline condition, with the economy projected to normalise and business expected to be re-established in a short-medium term. The spatial extent of impact would generally be confined to a suburb level. The likelihood of these changes occurring is near certain. Considering this, the overall impact of construction activities on the socio-economic environment is a moderate negative.

7.3.3 Social infrastructure

The construction of the project would result in temporary or permanent impact upon social infrastructure facilities and open spaces at specific locations within the study area.

It should be noted that several areas previously intended to be affected by construction as part of the concept design have now been avoided in the reference design. This has resulted in fewer and less severe impacts on social infrastructure and open space. The reference design has avoided direct impacts upon Easton Park, Algie Park, Blackmore Park and the Sydney Secondary College (Leichhardt campus), which were all previously proposed for construction activities.

Direct impacts on social infrastructure facilities and open spaces that would be permanently acquired or temporarily leased by the project include:

- Buruwan Park – 0.35 hectares permanently acquired to facilitate the new alignment of The Crescent

[38] See: https://www.finance.nsw.gov.au/sites/default/files/Guidelines_determination_compensation_business.pdf

- King George Park – permanent acquisition of 0.08 hectares and temporary acquisition of 0.05 hectares of the park (adjacent to Byrnes Street) to facilitate the Iron Cove Link portals and associated widening of Victoria Road, as identified in **Chapter 12** (Land use and property) of the EIS.
- King George Park – temporary acquisition of the informal area (0.18 hectares) of the car park at Manning Street, which is within the boundary of King George Park, to formalise the car park and provide a bioretention facility.

Buruwan Park

Buruwan Park is a passive open space area forming part of the active transport link through to Rozelle Bay. The link runs from Railway Parade through to The Crescent and also provides access to Rozelle Bay light rail stop. The park is predominantly utilised by pedestrians and cyclists. The park currently has poor surveillance with evidence of anti-social behaviour in the form of graffiti. The park has no permanent outdoor furniture and has limited grass area for people to relax or play. The landscaping within the park and its position adjoining Whites Creek does provide visual amenity, however the park is affected by traffic noise from City West Link and The Crescent. Due to the presence of more substantial parks nearby and the creation of the new open space at Rozelle Rail Yards, there remain, and will exist in the future, other options for the community in terms of open space if the park is removed.

King George Park

King George Park offers a variety of active and passive recreation spaces. The park is heavily utilised by local residents and visitors from the broader district due to its high amenity value and park facilities. The park also contains a section of the Bay Run, which is a highly valued pedestrian and cyclist connection.

Land adjacent to Byrnes Street and Victoria Road in King George Park would be required for construction. As identified in **Chapter 6** (Construction work) of the EIS only a small portion of the park near Victoria Road would be required. This portion of land is currently occupied by the Bay Run path and landscaping and other than the path connection, the area does not appear to be used for passive recreation purposes.

The Bay Run connection to Iron Cove Bridge would be slightly altered but maintained during the construction period.

The informal car park on Manning Street, would be reconfigured as a formal car park and a bioretention facility. There may be a slight increase in the demand for parking in surrounding residential streets during construction. This would be alleviated as soon as the formalised car park is established. The bioretention basin would however occupy a proportion of this land long-term. This would have limited effect on the socio-economic environment.

Summary

Acquisitions would result in a medium-term change to the existing baseline environment. The severity of change is however small and confined to a suburb. There is a high likelihood of these changes occurring, with slight consequences. Considering this, the overall impact of construction activities on the socio-economic environment is a minor negative.

7.4 Community values

Community values across the study area may be categorised under neighbourhood identity and character, community health and safety and community cohesion. The socio-economic impacts associated with each of these elements are outlined in the following sections.

7.4.1 Neighbourhood identity and character

The preservation of neighbourhood identity and character was raised as being an item of high community importance during consultation. This included the protection of established vegetation and heritage items, the preservation of public art and monuments and the protection of the amenity and accessibility of open space and recreation areas.

As identified in **Appendix S** (Technical working paper: Biodiversity) of the EIS, vegetation removal would be required to facilitate construction, including street trees. Trees contribute to the identity of a neighbourhood, provide protection from the elements and provide intermittent or consistent screening and privacy. As such, the clearing of established vegetation is likely to be of concern to the community, particularly those where the visual amenity and landscape character of the area or property is altered due to a reduction in landscape screening.

As outlined in **Appendix O** (Technical working paper: Landscape and visual impact) of the EIS, the removal of trees would expose residents, pedestrians and motorists to direct views of fencing and hoarding and other large elements of construction. This would result in a reduction in the amenity and character of affected environments, which are considered a high community value.

Public art and monuments contribute to neighbourhood identity and character, holding sentimental value for the community. Only two items of public art have been identified within the project footprint – the statues of soldiers on the approaches of Anzac Bridge and the mural along The Crescent between City West Link and Johnston Street. These items of public art would be retained and protected during construction of the project, resulting in negligible effects.

The heritage places of NSW not only reveal the story of Australia's past; they safeguard and enrich our present and future. For communities, heritage plays a major role in the appeal and life of neighbourhoods[39]. The community consultation process identified that preserving the heritage character of an area was a high priority for residents.

Appendix U (Technical working paper: Non-Aboriginal heritage) of the EIS identifies that the project directly affects five listed heritage items across the study areas, which are:

- Demolition of three statutory heritage items of local heritage significance, being:
  - Stormwater canal at Rozelle
  - 'Cadden Le Messurier' at Rozelle
  - Former hotel at Rozelle
- Partial demolition of one statutory heritage item of local heritage significance, being the Whites Creek Stormwater Channel No. 95
- The project temporarily encroaches into the south western boundary of the curtilage of the White Bay Power Station which is a State Heritage Register (SHR) listed item. The minor encroachment occurs during the construction phase of the project as a result of the alignment of the temporary Victoria Road bridge. However, the works would be some distance from the Power Station building itself and the building would not be physically impacted by the project.

Twenty-one other statutory heritage items of State or local heritage significance and heritage conservation areas (HCAs) would be subject to indirect impacts through potential vibration, settlement and visual setting. The project also directly affects nine individual buildings/structures assessed as being potential local heritage items which would be fully demolished. One landscape feature assessed as being a potential local heritage item would be partially demolished, being the sandstone cutting at Rozelle Rail Yards.

One structure assessed as being a potential heritage item of State significance would be indirectly impacted through vibration which is the southern penstock associated with the White Bay Power Station. Six other individual buildings/structures assessed as being potential local heritage items would be subject to indirect impacts through potential vibration, settlement and visual setting.

Appendix U (Technical working paper: Non-Aboriginal heritage) of the EIS concludes that the overall impact of the project on heritage would be moderate. As heritage is of high value to communities

[39] Heritage listing explained What heritage means for you, Heritage Council of New South Wales viewed at: www.environment.nsw.gov.au/resources/heritagebranch/heritage/HeritageListing2010final.pdf on 10th October 2016.

within the study area, the loss of heritage items may diminish the sense of place and neighbourhood identity valued by the community. Various management measures would be implemented to reduce the loss of heritage, including photographic archival recordings and salvaging historic fabric and features to be partially re-instated upon completion. Considering the nature of some of the heritage items being of less visual prominence and the project intent to implement various mitigation measures, the extent of impact on sense of place and neighbourhood identity is moderate negative.

The preservation of the accessibility and amenity of open space and recreation areas was also raised during consultation as an important community value. Access to open space and recreation areas provides the opportunity for numerous community-scale health benefits including improved overall cardiovascular health, reduced stress levels and reduced recorded instances of depression[40]. Maintaining the accessibility and amenity of open space and recreation also increases opportunities for social interaction and provides an area to break away from the urban environment to relax, play, exercise and congregate, hence contributing to the overall mental health of local communities.

An increase in construction activity in or around open space and recreation areas has the potential to reduce the amenity and accessibility of these areas. This may deter people from using such facilities and may increase user demand and crowding at other locations. Community consultation identified Easton Park, Blackmore Park, the Bay Run, King George Park, Sydney Park, the Glebe Foreshore parks (including Federal and Bicentennial parks) and Whites Creek Reserve as open space areas that hold particular community value. There would be some impacts to limited areas of King George Park and all of Buruwan Park during construction. There would not be direct impacts to other open space areas during construction. As identified in **section 5.2**, there are a number of other parks and recreation spaces located in proximity to the construction compounds that may be indirectly affected by the project. The direct and indirect impacts on social infrastructure have been assessed in **section 7.10**.

Overall, construction of the project would directly affect values held by the community around neighbourhood identity and character. Although the impacts would generally be confined to localities around construction compounds, they would be medium-long term and reflect a medium change to the existing baseline environment. The likelihood of impacts occurring ranges from possible to highly likely and the consequence on the socio-economic environment would be moderate. As such, the overall significance of impact upon the socio-economic environment would be moderate negative.

7.4.2 Community safety and health

Community safety and health were identified as being of high community value during consultation (see **Chapter 6**). If unmanaged, the construction impacts of noise, light spill, dust and vibration may affect this core value. This impact would be felt more explicitly by residents and building occupants that work, live or participate in recreation in areas closest to construction sites.

Fifty-one per cent of the business survey respondents stated their business would be negatively affected by disturbances (such as noise, dust and vibration). Businesses raised human health concerns arising from the potential reduction in local air quality due to the construction phase of the project. **Appendix K** (Technical working paper: Human health risk assessment) of the EIS has considered the risks associated with construction of the project on the health of the immediate and wider community. Specifically, the assessment identifies potential health risks associated with following consequences of construction:

- Noise and vibration
- Air quality
- Traffic congestion
- The property acquisition process.

[40] Healthy Spaces and Places, 2009, '*Design Principles - Parks and Open Space',* viewed on 20th June 2017, https://www.healthyplaces.org.au/site/parks_and_open_space_full_text.php

Overall, the **Appendix K** (Technical working paper: Human health risk assessment) of the EIS found that without mitigation, extended elevated levels of noise, vibration and construction dust could result in adverse health effects across the community. These health effects may include disturbance of sleep, reduced capacity for concentration, interference with speech and other activities, potential effects on cardiovascular health, annoyance and increased stress levels.

As discussed in **section 7.2.1** (Noise and vibration) increased levels of noise and vibration may affect human comfort and cause sleep deprivation if noise exceedances persist. Structural damage to properties as a result of vibration was also a concern for some residents. Impacts resulting in sleep disturbance or direct impacts on property were considered likely to trigger higher levels of anxiety and stress resulting in direct impacts on health and wellbeing.

Dust generation from construction activities was raised as a concern due to the potential impacts on the health of some sections of the community who may be more sensitive to changes in air quality. This may include people with pre-existing medical conditions such as asthma or other respiratory difficulties. This impact is likely to be relevant for works within the Pyrmont Bridge Road tunnel site in particular, where a special purpose school is adjacent to the construction site. A number of childcare centres and education facilities are also in close proximity to construction sites (see **section 7.10**). These facilities may be subject to reduced amenity which may affect concentration and learning ability.

Without mitigation, noise, vibration and dust levels would result in a major impact on communities surrounding the project. Consequently, the management and mitigation measures outlined in the EIS, CNVMP and Construction Air Quality Management Plan (contained within the CEMP) would be essential to reducing these levels and the subsequent health effects in local communities. Despite these measures, a small number of people may still experience adverse health impacts from these project-related sources.

An increase in construction traffic and heavy vehicles within the study area, changed traffic conditions and the introduction of construction sites, may affect community safety around roads and active transport connections. A reduction in safety may be experienced:

- In proximity to construction compounds where there may be limited lighting, reduced casual surveillance or where construction hoardings may reduce sightlines
- Near community facilities that are in close proximity to construction sites, particularly facilities that are used by children such as schools, out of school care, childcare centres, playgrounds and sporting facilities
- At at-grade intersections where pedestrian crossings have been established to compensate for the loss of a pedestrian underpass or overpass
- On local or arterial roads with higher traffic volumes than would normally be experienced, as a result of the presence of construction traffic and construction worker's vehicles
- On local roads due to a potential increase in traffic volumes as a result of route re-direction (rat-running)
- Along pedestrian and cyclist routes that have been diverted and may not accommodate the pre-existing level of lighting, casual surveillance or general activity.

Without mitigation, the traffic impact of construction activities would result in a moderate negative impact upon the safety of local streets. Environmental management measures, including the CTAMP, would be prepared as part of the CEMP to identify traffic management measures with a view to maintaining safety for pedestrians, cyclists and other road users near construction works and on haulage routes.

Traffic congestion and loss of parking has the potential to contribute to health impacts (such as stress and anxiety) due to reduced air quality, increased noise, reduced amenity and safety. **Section 7.1.1** (road network) has evaluated impacts on traffic congestion during the construction phase of the project and **section 7.1.2** has evaluated parking impacts.

The community consultation process identified high levels of concern relating to the property acquisition process necessary for construction. As outlined in **section 7.3**, the process may trigger anxiety and stress through:

- Uncertainty with respect to why the property in question is, or may be, acquired
- Timing of acquisition
- The amount of time in which existing users and services are allowed to relocate
- The need to find suitable alternative accommodation, at an affordable price and in an appropriate location, ie participating in the property market
- Implications to social or business networks
- The cost and inconvenience associated with relocation.

Overall, construction of the project would directly affect values held by the community around community safety and health. Although the impacts would generally be confined to localities around construction compounds, they would be medium-long term and reflect a small change to the existing baseline environment. The likelihood of effects on health and safety is possible. As such, the overall impact upon the socio-economic environment would be minor negative.

7.4.3 Community cohesion

Infrastructure that creates a physical or psychological barrier between communities may produce a real or perceived barrier, reducing the capacity for community cohesion, including social and economic interaction. Community consultation identified community cohesion as a core community value, particularly within the Leichhardt-Glebe precinct. The business survey reported that 48 per cent of customers work or live within the local area, indicating a strong dependence on community connections.

A number of the larger arterial roads, including City West Link, Victoria Road, Parramatta Road and the Princes Highway currently operate as physical and psychological barriers between communities. These roads carry large volumes of traffic, with motor vehicles generally prioritised over pedestrian and cyclist connections. Rozelle Rail Yards, City West Link, the light rail corridor and Whites Creek act as a substantial physical barrier between the communities of Annandale, Rozelle and Lilyfield.

Community severance may be substantially increased by the presence of major construction projects. Impacts typically arise as a result of local road detours, changes to active and public transport routes, and increases and decreases in the amount of traffic on connector roads. Community severance may lead to short or long term changes to people's behaviour patterns, affecting established community networks and an area's character and sense of place. The full extent of changes to access and connectivity are discussed in **section 7.1**.

During construction, temporary changes to the road network, particularly along City West Link, Victoria Road, The Crescent, and Lilyfield Road, may contribute to community severance and disconnection.

Any temporary or permanent changes in access to or safety of social infrastructure, community resources or to other desirable locations (such as employment, study, friends and family) may cause community severance, potentially affecting the durability of community networks.

Consultation with the community highlighted that access to water and open space was highly valued by the community. This included access to the Glebe foreshore walkways and the Bay Run. Although minor amendments are proposed to the Bay Run footpath, access is proposed to be maintained throughout construction, with limited effect on community cohesion.

As outlined in **section 7.1.4**, a number of pedestrian and cyclist links are proposed to be altered as a result of construction of the project. This would include the removal of two pedestrian bridges across Victoria Road and another across City West Link which are popular for both recreational and commuter pedestrian and cyclist traffic. These connections also provide important access to Rozelle Bay and through to the Glebe foreshore walkways. The removal of these bridges, despite the presence of temporary alternatives, may reduce community cohesion and perception of access to a place.

At all times during construction, access to the Glebe Foreshore walkways, the waterfront and the marina facilities at Rozelle Bay would be retained. The presence of the civil site at The Crescent would reduce the amenity for pedestrians and cyclists along the Rozelle Bay walkways. This reduced amenity may deter people from participating in community activities or active transport, potentially reducing the connection to an environment and the general feeling of community cohesion.

While physical and psychological community severance would be increased during construction of the project, these changes would result in only slight variation from the existing socio-economic environment. Mitigation measures would be put in place during construction, including the transitioning of pedestrian and cyclist connections to alternative routes prior to the removal of the former. Impacts would generally be confined to suburbs around the project footprint and would extend for a medium-long term duration. The likelihood of effects on community cohesion is possible. As such, the overall impact upon the socio-economic environment would be minor negative.

7.5 Population and demography

Population and demography may be influenced by project-related factors, generally relating to the acquisition of properties (see **section 7.3**).

The acquisition of 26 residential properties for construction and operation of the project would be required within the Leichhardt-Glebe precinct. Based on the average household size of 2.2 persons and ABS residential dwelling statistics showing that 39 per cent of households in this area are couples with children and 28 per cent are lone person households, it is estimated that around 60 people would be affected by property acquisitions in this precinct. This calculation would likely be a minimum, as multiple strata titles may exist within some parent lots. No residential property acquisitions are proposed for the Ashfield-Haberfield precinct or the Alexandria-Erskineville precinct.

The potential permanent relocation of residents as a result of acquisitions makes up a very small proportion of the overall population within the LGA (potentially 60 people out of around 182,000 living in the Inner West LGA). Although likely to be felt at a locality level, these changes are not expected to affect the population and demography of the precinct or study area as a whole. As may be seen in **section 5.1**, the study area is projected to experience significant growth in the population over the next 20 years, driven by urban renewal programs and infill development projects. The expected population changes as a result of construction are likely to be negligible in comparison to the associated changes from other local and regional urban development factors.

The workforce for construction of the project would be expected to be sourced from across the broader Sydney region. Due to its location and accessibility, it is unlikely the project would result in the need for workers to relocate to live in the study area. As such, the presence of construction workers would have a minimal effect on local residential population and demographics. The severity of impact of the project on the population and demography of the study area is expected to be neutral with the likelihood of change possible. Considering this, the overall impact of construction activities on the socio-economic environment is a negligible.

7.6 Economy

7.6.1 Employment and construction expenditure

Construction activity, including utility works, directly benefits the economy, injecting economic stimulus benefits into the local, regional and state economies. The economic benefit of construction is multi-dimensional, including:

- Increased expenditure at local and regional businesses through purchases by construction workers
- Direct employment through on-site construction activities
- Direct expenditure associated with on-site construction activities
- Indirect employment and expenditure through the provision of goods and services required for construction.

The direct and indirect employment benefits of the construction may be quantified based on the following assumptions:

- A base year of 2018 for the project start-up
- A five-year construction period (from 2018 to 2023)
- The complete project opening to traffic in 2023.

The number of direct and indirect jobs generated as a result of the proposed five-year construction period has been estimated in this assessment. Direct jobs are defined as those relating to the project's development throughout construction, commissioning, operating and managing the facility. Direct jobs that would be generated include onsite labour, supervision, professional services and project managers.

Indirect jobs are defined as jobs (within Australia) that support the project through the provision of goods and services such as offsite manufacturing and equipment hire.

Major infrastructure projects may also have flow-on benefits to job generation through the raw material supply chain and jobs created as a result of new infrastructure. Secondary indirect jobs are not however included in job generation calculations.

It is estimated that based on a five-year construction period, around 14,300 direct (onsite) job years would be created between 2018 to 2023, which is equivalent to around 2,800 jobs per annum. Furthermore, about 42,300 indirect (off-site) job years would be generated, equivalent to around 8,400 jobs per annum based on the project period.

As a commitment of the project, the WestConnex Training Academy has been established. As outlined in the WestConnex Sustainability Strategy, the entire WestConnex project aims to deliver 500 apprenticeships/traineeships during the life of the project. A portion of this number would be trained on the M4-M5 Link project. In addition to offering new opportunities for employment, the WestConnex Training Academy is providing training, resulting in accreditation or certification, in tunnelling to people who have transferrable skills from other industries, like the natural resources sector. This would allow people with experience from other sectors, like mining and heavy industry, to join the workforce.

The WestConnex Sustainability Strategy also incorporates initiatives to improve Aboriginal and Torres Strait Islander participation in construction and provide opportunities to Aboriginal and Torres Strait Islander enterprises. Under the Aboriginal Participation in Construction Policy a percentage of the total estimated value of the contract must be directed to Aboriginal related employment and education activities, procurement of goods or services from recognised Aboriginal businesses or other programs. The targeted project spend is currently 1.5 per cent of the total estimated value of the contract.

Overall, construction of the project would produce medium-long to long-term job opportunities, skill development and economic benefit to the region. There is a high likelihood of these benefits occurring with potential major consequence on the socio-economic environment. As such, the overall impact upon the socio-economic environment would be major positive.

7.6.2 Value add

The construction industry is a significant component of the Australian economy, accounting for 7.7 per cent[41] of Gross Domestic Product (GDP) and employing over one million workers across the country[42]. The industry has strong linkages with other sectors, so its impacts upon the economy go further than the direct contribution of construction.

In calculating the flow-on economic benefits of a particular project, it is common practice to employ economic multipliers. Multipliers refer to the level of additional economic activity generated by a source industry. There are two types of multipliers:

- Production induced, which is made up of:

[41] ABS, 2012 '1301.0 – Year Book Australia, 2012 – Construction Industry', latest issues released 24/05/2012, accessed at: www.abs.gov.au/ausstats on 19/08/2016

[42] IBIS World, 2016, 'Construction Market Research Report', ANZSIC E, May 2016

- First round effects: which is all outputs and employment required to produce the inputs for construction
- An industrial support effect: which is the induced extra output and employment from all industries to support the production of the first round effect

· Consumption induced: which relates to the demand for additional goods and services due to increased spending by the wage and salary earners across all industries arising from employment.

The consumption effects comprise the increase in output required to satisfy the additional demand generated by increased wages, salaries and supplements resulting from all increased output, ie direct and indirect employment.

The estimated total project cost as detailed in the Business Case and Budget Papers is $7.245 billion. For the purposes of this assessment, the estimated hard construction costs of the proposed M4-M5 Link was assumed to be around 85% of this total project cost. Using ABS multiplier tables and HillPDA's industry knowledge, the economic multipliers indicate that construction would generate around $5.8 billion of activity in production induced effects and around $7.7 billion in consumption induced effects. Total economic activity generated by the construction of the proposed development would be about $19.7 billion. These multipliers are based on both the building and non-building industries and therefore the effects are an approximation only.

It is important to note, however, when reviewing these estimates that multiplier effects have a national impact and not necessarily a local impact. Care is required in interpreting multiplier effects; which have been applied on a theoretical basis to produce estimates of the potential flow-on effects of construction activity to the rest of the economy.

Overall, construction of the project would long-term, economic benefit to the region. There is a high likelihood of these benefits occurring with potential moderate consequence on the socio-economic environment. As such, the overall impact upon the socio-economic environment would be moderate positive.

7.7 Utilities

Communities and businesses are dependent on public utilities, particularly the supply of electricity and water, for the conduct of a wide variety of daily activities. The disruption of these services, even for short periods of time, may result in substantial inconvenience to daily life, business operation and revenue generation. Such disruption, arising from accidental or planned shutdowns to enable construction, was a concern raised during the community and business consultation process.

The following utilities may be disrupted during construction including:

· Communication infrastructure outages (ie internet and phone line use)

· Water or sewer connection outages

· Disruptions to electricity and gas connections.

During construction, public utilities and services may be temporarily disrupted while they are temporarily or permanently relocated, or for safety reasons. Disruptions for safety reasons could arise when construction activities involve relocating power lines or operating machinery in close proximity to power lines.

As outlined in **Appendix F** (Utilities Management Strategy) of the EIS, existing utility services would be avoided or protected wherever possible. However, utility relocations and works would still be required both inside and outside the project footprint. Preliminary information regarding utilities that are required to be relocated or redundant utility services required to be removed is provided in **Appendix F** (Utilities Management Strategy) of the EIS.

The socio-economic consequences of disruption to public utility services may affect individuals, businesses, emergency services and community group operations, and economic viability generally. Examples of socio-economic disruptions arising from utility outages include:

- Businesses that are reliant on the purchasing of goods and services electronically and through the internet (ie Eftpos machine) would be required to limit purchases to a cash only system
- Business operations that are reliant on electricity and telecommunication networks to run computers, machinery or communication systems would likely have to pause operation
- Business operations such as restaurants and cafes that are reliant on clean potable water, electricity and gas for the preparation and operation of food and beverage services would be required to alter and/or reduce their service offering during offline periods
- Residential households may need to alter or limit daily activities such as showering, cooking and cleaning
- Interruptions to scheduled night-time sporting activities due to lack of lighting
- Emergency services and hospitals may require utilisation of backup electricity, water and communication arrangements.

Such disruptions may result in an economic loss for a business and could affect business viability if disruptions continue for extended periods. This may also affect employees who may experience an economic loss if employment is temporarily placed at risk, particularly those employed on a casual basis. Residents would also feel these disruptions as they create inconvenience, require a change in routine and have the capacity to reduce the productivity of individuals and increase household costs. Individuals that are reliant on home-based medical equipment (eg dialysis) may also be more vulnerable to changes in utilities.

When utility works commence, there may a reduction in property access, reduced visibility of businesses, and amenity impacts on sensitive land uses. These impacts, however, would be temporary and localised.

In most instances, impacts on utilities would be temporary and may be managed through standard management measures, as outlined in **Appendix F** (Utilities Management Strategy) of the EIS. A Utilities Coordination Group (UCG) with representatives from other concurrent projects and asset providers operating in the same locality, would be established to ensure a coordinated approach to adjustments, relocations and protection works. This UCG would include a community engagement team and Council representatives to ensure the community is appropriately notified in advance wherever possible. Accidental events would be more difficult to manage. All reasonable endeavours would be undertaken by SMC and its contractors to avoid the latter, in accordance with the Construction Management Environmental Plan.

Extended utility outages are unlikely however short term outages to facilitate utility works are highly likely. The consequence on the socio-economic environment would generally be limited to a locality or suburb, be short term and have only a slight effect on the baseline condition. The overall impact on the socio-economic environment from planned utility outages would be a minor negative.

7.8 Construction fatigue

Construction fatigue relates to receivers that experience construction impacts from a variety of projects over an extended period of time with few or no breaks between construction periods. Construction fatigue typically relates to traffic and access disruptions, noise and vibration, air quality and visual amenity and social impacts from projects that have overlapping construction phases or are back to back.

Construction fatigue from cumulative construction projects or multiple construction effects of a single project may be felt by residents, businesses and social infrastructure users around Haberfield, Rozelle and St Peters, where extensive construction work is already being undertaken for other projects. Such considerations are most relevant to properties surrounding the New M5 and M4 East construction ancillary facilities, as well as at Rozelle where the light rail maintenance depot works and the site management works have already exposed people to construction impacts over an extended period. The study area is also subject to ongoing urban development, with many of the LGAs in the study area projected to have significant population growth (see **section 5.1**).

Where construction timeframes overlap or are proximal to other project activities for longer durations of time, individuals and communities may experience effects on mental health through stress and

anxiety. Health effects associated with construction fatigue are further discussed in **Appendix K** (Technical working paper: Human health risk assessment) of the EIS.

Construction fatigue has the capacity to extend the construction effects on businesses and the economy. As identified in **sections 7.6** and **7.9**, these effects could be both positive or negative depending on the type of construction impact. As the sensitivity of businesses varies, according to the level of service they provide (ie serve a local, district or regional trade catchments) and how sensitive the businesses are to changes in amenity and accessibility, the ability of a business to adapt to an environment would affect business viability and turnover. The vulnerability of businesses to an impact may deteriorate or be enhanced more rapidly depending on the duration and severity of exposure to construction activities. For example, a convenience retail business that is located in close proximity to multiple construction activities and projects, may experience an extended duration of strong passing trade. Whereas, a business that is dependent on pleasant amenity may experience an extended reduction in trade that may require the business to relocate or close.

7.9 Business and industry

The following section provides an overview of the socio-economic impacts that may be experienced by businesses within the study area during construction of the project. It draws on the comments and information gathered by the business impact survey, along with an appreciation of the existing study area.

Businesses across the study area may experience impacts from construction activities, such as reduced efficiency of the road network, loss of parking and changes to delivery arrangements. These impacts would be an inconvenience for businesses affected, although they would be temporary in nature. The extent of impact on individual businesses would vary depending on the proximity to construction works and the duration of construction activities.

A business impact survey was undertaken at certain locations across the study area to gauge the perception of business impacts associated with construction (see **section 3.4** for business survey methodology and **Annexure A** for the survey report). When asked about how construction may affect their overall trade and revenue, 49 per cent of respondents anticipated that there would be no obvious change in trade as a result of construction activities. Twenty per cent of respondents believed that they would experience a loss in trade, and 12 per cent believed they would experience a significant loss in trade. Conversely, 17 per cent of respondents predicted construction would be positive for businesses. Of the respondents that believed construction would be a positive for trade, over 70 per cent were food and beverage business types and 10 per cent were retail operations.

An exploration of the potential impacts on businesses is provided below.

Passing trade

Passing trade may be defined as those pedestrians, cyclists and motorists who choose to patronise a business because they see it when walking/riding/driving past, not because they planned to go there. Of the businesses surveyed, 37 per cent identified that they rely on passing trade, 22 per cent suggested that they partially relied on passing trade and 41 per cent stated they did not rely on passing trade.

The construction phase of the project would result in changes to vehicle and pedestrian flows that could influence the level of passing trade. Some businesses could benefit as passing trade is re-directed towards their business (ie through pedestrian or traffic diversions) while others might not, as traffic is diverted away or construction hoardings reduce the ease of access to/visibility of their business.

The majority of businesses clusters that offer retail and convenience services would experience an increase in construction workers in the area, which may generate increased passing trade. As identified in Chapter 6 of the EIS, the total peak workforce would be around 1,500 personnel across the study area. This would be particularly beneficial for the smaller local business clusters such as Ramsay Street Convenience, Lilyfield Neighbourhood, Norton Street North, Catherine Street Convenience, Victoria Road and Darling Street due to the additional 950 workers around the Rozelle area and 250 workers around the Haberfield area. Increased passing trade would generate increased

business revenue, directly benefiting the socio-economic environment. It is unlikely that any centre would experience a noticeable loss in passing trade due to construction.

Employee and customer access and travel time

Businesses may also be affected due to delayed or hindered access to workplaces or servicing areas owing to local traffic construction constraints and congestion. As identified in **section 7.1.3**, road network performance is expected to be affected during construction with a number of temporary road closures, increased construction traffic and an expected worsening of intersection performance at some intersections. These changes may have a discernible effect on employee and customer travel time and the efficiency of servicing and deliveries.

A number of business survey respondents suggested that traffic congestion or delays would act as a disincentive for customers visiting the local business area and would therefore affect business turnover. The survey results indicated that 42 per cent of respondents anticipated the project would have an adverse impact on customer access, during the construction phase, while 46 per cent identified no impact, seven per cent were unsure and five per cent identified a potential benefit.

There is also the potential that customers may not return to an area due to the accessibility challenges experienced, resulting in a potential loss of trade for some businesses. If there are competing centres in more easily accessible locations that offer similar goods or services, access difficulties and delays may result in long-term changes to consumer behaviour and significant permanent economic impacts for certain local businesses.

The productivity of employees may also diminish due to construction traffic or travel delays. Employees may arrive late to work or need to leave earlier in response to changes in traffic conditions. Twenty-five per cent of business survey respondents suggested that construction activities would have a negative or significant negative impact on employee travel times, while 69 per cent believed employee access would remain consistent and four per cent suggested that there might be an improvement in travel times during construction.

The ease of access to a place of employment may also be a factor in attracting or deterring existing or potential employees from remaining in a job or applying for a job. If a place of work becomes too difficult to access it begins to jeopardise the time an individual has to spend with family and friends or undertaking non-work related activities and may cause individuals to seek alternative employment options. As such, employers may have difficulty attracting or retaining staff, which may affect business productivity and function. **Section 7.1** details the accessibility and connectivity impacts associated with construction of the project.

A number of business clusters would experience a potential decline in nearby road network efficiency. Specialised retailers may experience a greater decline in their customer base, as clients seek to avoid traffic delays, travelling instead to more accessible business centres that offer similar products. Business clusters including Chapman Road business cluster in Annandale, Annandale-Camperdown business cluster near Pyrmont Bridge Road and Parramatta Road, Annandale and Roberts Street business cluster in Rozelle may be more vulnerable to these changes.

Although employee travel time may increase slightly, there is adequate provision of public transport in most locations around the business clusters that provide alternative commuting options.

The State Transit centre (bus depot) at Leichhardt would be heavily dependent on efficient transport connectivity and access. Although there would be minimal direct access impacts, a reduction in the efficiency of the road network overall may result in adverse effects on the transit centre.

Customer and employee parking accessibility

The removal or increased competition for car parking was identified as having a potential impact on convenience for workers, clients and customers. These changes have the potential to influence decisions by customers/clients to use a certain business. The business survey results identified that 60 per cent of employees were driving to work with 55 per cent of businesses having off-street parking available. Of this off-street parking, 31 per cent had less than five spaces, five per cent had between five and ten spaces and 15 per cent had more than ten spaces. The remainder of respondents indicated no off-street parking was available or did not respond to the question.

Concerns relating to a worsening of customer car parking accessibility during the construction phase were raised by 39 per cent of business survey respondents. Fifty per cent of businesses surveyed did not think that construction would have any impact on customer parking. These results were similar to the results of questions relating to employee parking accessibility, where 70 per cent of businesses did not believe that construction would have adverse impacts on employee parking. Twenty-six per cent of businesses believed that construction activities would adversely affect employee parking and accessibility. A limited number of respondents (less than 5 per cent) thought that construction activities would have a positive effect on employee or customer parking. Changes to parking accessibility as a result of the project are identified in **section 7.1.4**.

The business clusters of Parramatta Road Haberfield, Canal Road, Lilyfield Road, James Craig Road, Victoria Road, Annandale-Camperdown and Euston Road may all experience increased competition for car parking in the surrounding area. As the majority of these business clusters would have their own private parking, it is unlikely that a reduced supply in car parking would have a substantial impact on employee or customer access.

Servicing and deliveries

Businesses rely on deliveries to support the sale of products and/or services, as well as relying on services from other businesses such as refuse collection. These activities are often required to occur daily, and in some cases, multiple times per day. It therefore follows that temporary street closures, the relocation/removal of car parking along street frontages, and the location of construction sites could collectively or individually hinder servicing and delivery opportunities, resulting in time and vehicle related costs as well as lost revenue for businesses. **Section 7.1** discusses changes in access and connectivity as a result of construction.

Some business types are likely to be more affected by changes to access than others, particularly those that rely on efficient deliveries or distribution. Ninety-one per cent of business survey respondents stated that they received deliveries for their business, with 58 per cent of these businesses stating that they relied on loading zones or on-street parking for deliveries. These results suggest that changes to the ease of access to on-street parking or loading zones would affect the operation of a large percentage of businesses in the study area.

Heavy traffic due to construction activities or alterations to road networks may also create challenges for servicing and deliveries. Any change that results in potential disruptions to travel/route redirections and extended travel times may incur an increase in vehicle operating costs and delivery delays for customers or businesses. This would be a particular issue for service and delivery based businesses (ie couriers or distributors) that operate on a time and cost basis or rely on efficient service provision as a core component of their business offering.

Road alterations and traffic delays are anticipated during for construction phase of the project. These changes would have a network impact on the efficiency of servicing and deliveries across the broader region. All of the business clusters would be dependent on servicing and deliveries as part of normal business operation. The construction of the project, is however, not anticipated to remove loading zones or parking that would affect the business clusters.

Although the efficiency and condition of access routes may alter, such as for businesses along Lilyfield Road, James Craig Road and potentially Roberts Street, it is unlikely that this would have a substantial impact on business revenue, overheads or productivity.

Ambience

The ambience of a business is defined by its character and atmosphere. Construction activities have the potential to alter the ambience of an environment due to the generation of dust, pollution, noise, vibration and visual impacts, potentially affecting the function of a business or the ability to attract and retain customers. Concerns regarding noise, vibration and dust impacts were raised by 60 per cent of business survey respondents.

Noise and vibration due to construction activities have the capacity to adversely alter the amenity of the existing urban environment and affect business revenue. The degree of construction noise and vibration impacts on individual businesses would vary dependent on the existing noise levels, distance from the construction activities, the nature of works and the time of day or night that work take place.

Construction noise impacts are discussed in **section 7.2.1**. Businesses that are reliant on the external ambient environment to some degree, such as beauty salons, restaurants or cafes, may experience a decline in customers due to negative customer experiences potentially encouraging them to travel to more amenable locations that offer similar services. This change in consumer behaviour would directly affect business viability as trade and customer expenditure would reduce.

Vibration impacts are provided in **section 7.2.1,** with a detailed assessment of noise and vibration impacts provided in **Appendix J** (Technical working paper: Noise and vibration) of the EIS. Vibration impacts may impede businesses that rely on sensitive instruments or manufacturing processes (ie medical and dental facilities, printers, mechanical manufactures). This may potentially incur additional costs to businesses or require businesses to cease operation during times of high vibration activities.

Construction related activities also have the potential to generate increases in dust and reductions in air quality, which may result in potential increased operating costs (including cleaning and maintenance costs), reduced hygiene of food preparation or increased instances of respiratory issues for employees or customers. **Section 7.2.3** identifies that construction activities would affect air quality, with a detailed assessment of impacts provided in **Appendix I** (Technical working paper: Air quality) of the EIS.

Thirty-four per cent of business survey respondents perceived that the air quality disturbances related to construction would cause negative impacts on their business, with a further 17 per cent considering that it would be significantly negative. Construction vehicles and spoil haulage were also raised as a concern by businesses during the survey, with a preference that these activities only occur outside peak periods and to predominantly use arterial roads. Numerous food preparation companies and hospitality services raised air quality as an issue, with specific reference to dust impacts. Traffic related air pollution was also raised by a number of businesses who voiced concerns around the amenity of the environment and ability for patrons to enjoy footpath dining. These factors have the capacity to increase business expenditure and reduce customer interest and product sales, therefore affecting business revenue.

During construction, the visual amenity of businesses has the potential to be affected by factors such as the removal of established vegetation, the installation of construction hoardings and/or the visual appearance of construction sites. **Section 7.2.2** identifies construction impacts on visual amenity, with a detailed assessment undertaken in **Appendix I** (Technical working paper: Air quality) of the EIS.

The visual attractiveness of an environment may be important to businesses that rely on customer attraction to the pleasantness and quality of an environment, such as retail, personal service providers, cafes and restaurants. These businesses are more dependent on access to natural light and clear sight lines of the street to enhance the attraction of their business. This is particularly important for businesses that provide outdoor dining. Decreased visual amenity may result in a reduction in customer sales and repeat clients, affecting business revenue in both the short and long-term.

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. The Annandale-Camperdown business cluster is likely to have the highest sensitivity to vibration and noise impacts due to the large number of medical, industrial and service accommodation businesses in proximity. These businesses may be more susceptible to the effects of construction activities.

Employee productivity and communication capacity

Whilst the background noise levels in the study area are consistent with an urban environment, construction of the project would potentially increase these noise levels in certain areas. This has the potential to adversely influence employee productivity and capacity to interact with colleagues and clients.

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

High or ongoing noise exceedances may reduce employee productivity as staff may have greater difficulty concentrating on a task or experience a reduction in their health and wellbeing (ie headaches, increased stress and anxiety). This may potentially affect the productivity, efficiency and revenue capacity of businesses, particularly if the construction activities continue for extended periods. As presented in **section 7.2.1**, construction activities are anticipated to exceed noise levels in some locations. The **Appendix J** (Technical working paper: Noise and vibration) of the EIS provides specific information on where these exceedances are predicted to occur and how they would be managed and mitigated.

Medical and education businesses within the Annandale-Camperdown business cluster near Parramatta Road and Pyrmont Bridge Road intersection are at a greater risk of being affected by construction activities that produce vibration and noise. The commercial office businesses along Lilyfield Road may also have heightened noise and vibration impacts due to the close proximity of these uses to the Rozelle civil and tunnel site (C5). Any impacts are likely to be more of an annoyance impact and would be unlikely to result in significantly reduced productivity.

Business visibility

Businesses that rely on storefront exposure to attract customers may be affected by the presence of construction hoardings or reduced visibility of business advertising during construction. This has the potential to directly affect business revenue and turnover as customers do not see or are less inclined to enter a business due to construction activity.

A change in pedestrian or vehicle routes and traffic volumes may also affect the exposure of businesses to potential clients. Although people may not be inclined to access a business on the day they see it, they may remember a business and travel to it in the future. A reduction in business exposure due to construction hoardings or detours may reduce the number of future customers, affecting business revenue.

Business clusters may experience a slight reduction in business visibility due to people avoiding highly congested areas, however this variance in likely to be negligible. Construction hoardings and compounds are unlikely to block sightlines to any of the business clusters.

Demand for services

Construction activity also generates regional demand for services such as construction recruitment agencies, construction companies and resource suppliers. Although potentially not benefiting businesses in the local business precincts, construction activities do stimulate the broader economy, creating more employment opportunities both within and outside the precincts.

Summary of business impacts

As the sensitivity of business clusters varies dependent on the level of service provision they provide (ie serve a local, district or regional trade catchments) and how sensitive the businesses are to changes in amenity and accessibility, the ability of a business to adapt to an environment may affect business viability and turnover. The businesses vulnerability to an impact may deteriorate more quickly dependent on the duration and severity of exposure to construction activities.

Businesses repeatedly exposed to construction activities may be more susceptible to construction fatigue, which may have direct social and economic consequences, particularly if the business is already struggling to remain operational. Although numerous business clusters are likely to experience a change to the baseline socio-economic condition, in terms of the spatial extent of business impact across the broader region, construction effects are relatively localised. A number of convenience and food and beverage businesses, in close proximity to the construction sites, may in fact benefit from increased passing trade due to the additional construction workers in the locality.

To minimise the consequence and likelihood of impacts on businesses, a Business Management Plan is recommended to manage, minimise and avoid potential construction effects. The duration of construction effects on businesses would be for a medium-long term with the severity of change from the existing baseline condition medium. Effects on businesses are generally localised or limited to a suburb extent. The likelihood of construction effecting business operations is possible, with the consequence minor. Considering this, the overall impact of construction activities on the socio-economic environment is a minor negative.

7.10 Social infrastructure

Social infrastructure that is more sensitive to changes in the baseline condition include, educational institutions (including preschools, schools, universities, TAFE colleges), health care facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres, passive recreation areas (including outdoor grounds used for teaching) and active recreation areas (including parks and sports grounds).

As outlined in the above sections, changes in access and amenity for some social infrastructure facilities are anticipated during construction. This may arise from the introduction of construction sites to a locality or modifications to the transport network. The impacts of construction upon access and connectivity are outlined in **section 7.1.** An overview of the construction impacts on local amenity is provided in **section 7.2.**

Changes in amenity may affect how users interact with, or enjoy an environment, or their ability to participate and concentrate. The sensitivity of a social infrastructure user to a construction impact would vary dependent on proximity to the construction activity, the individual's sensitivity to the construction impact (ie noise, dust, vibration) and the duration of the activity.

The consequence of changes to access would vary across the spectrum of social infrastructure users, depending on what service or activity is undertaken at the facility. For instance, active sporting facilities, schools and hospitals may require good vehicle access to sustain these facilities. Access to these facilities during construction may be affected by delays or diversions and a reduction in the availability of car parking. A reduction in the convenience of access to social infrastructure may also deter users and potentially affect community participation levels, which would have an indirect impact on community values (see **section 7.3**).

Table 7-5 details the social infrastructure that has a higher likelihood of experiencing multiple effects of construction activity. The consequence of an impact on social infrastructure would vary dependent on the severity of change from the existing environment and the sensitivity of use types to construction effects. For instance, education facilities and childcare centres would be more sensitive to noise impacts as they may affect the capacity of students to hear and concentrate during lessons.

Social infrastructure users exposed to multiple construction activities may also be more susceptible to construction fatigue, which may have direct social and economic consequences.

Table 7-5 Social infrastructure likely to experience multiple construction effects

Construction site	Use type	Social infrastructure facility	Change to environment	Potential socio-economic effects
Haberfield Option A Haberfield and Ashfield Option B	Place of worship	Kingdom Hall of Jehovah's Witnesses at 12 Wattle St, Haberfield	· Day and night-time noise exceedances anticipated (>11 dBA) · Increased construction vehicles (Wattle Street) · Visual amenity reduction · Construction dust	· Reduced amenity and access, particularly when services and events are occurring · Competition for street parking
Haberfield Option A	Outdoor recreation	Timbrell Park at Henley Marine Drive, Five Dock	· Reduced access due to a decline in intersection performance (AM and PM peak)	· Access delays, particularly when grounds are used for PM sports
Haberfield and Ashfield Option B	Childcare centre	The Infants Home at 17 Henry St, Haberfield	· Day-time noise exceedances anticipated (>11 dBA) · Increased construction traffic on Alt Street	· Road safety · Reduced concentration · Reduced amenity during outdoor play and sleep times

Construction site	Use type	Social infrastructure facility	Change to environment	Potential socio-economic effects
Haberfield and Ashfield Option B	Educational facility	Juvenile Justice – Yasmar training facility	· Day-time noise exceedances anticipated (>11 dBA) · Vibration effects	· Disturbance of concentration and productivity
Haberfield and Ashfield Option B	Childcare centre	Chaya's Family Day Care 12/111 Alt Street, Ashfield	· Day-time noise exceedances anticipated (>11 dBA) · Vibration effects · Increased construction traffic on Alt Street · Construction dust	· Road safety · Reduced concentration capacity · Reduced amenity during outdoor play and sleep times
Haberfield and Ashfield Option B	Childcare centre	Nurjahan's Family Day Care, 12a/115 Alt Street Ashfield	· Day-time noise exceedances anticipated (>11 dBA) · Vibration effects · Increased construction vehicles on Alt Street · Construction dust	· Road safety · Reduced concentration capacity · Reduced amenity during outdoor play and sleep times
Haberfield and Ashfield Option B	Educational facility	Haberfield Public School - 24-26 Denman Avenue, Haberfield	· Increased construction vehicles on Bland Street	· Road safety for students · Access delays, particularly at school pick up time (pm) · Competition for parking
Darley Road civil and tunnel site (C4)	Childcare centre	Explore and Develop, 372 Norton Street, Lilyfield	· Day-time noise exceedances anticipated (>11 dBA)	· Reduced amenity during outdoor play and sleep times
Darley Road civil and tunnel site (C4)	Childcare centre	Billy Kids learning, 64 Charles St, Lilyfield	· Day-time noise exceedances anticipated (>11 dBA)	· Reduced amenity during outdoor play and sleep times
Victoria Road civil site (C7)	Childcare centre	Rosebud Cottage Child Care Centre at 5 Quirk Street, Rozelle	· Day-time noise exceedances anticipated (>11 dBA) · Changes in local road access · Increase construction vehicles on Quirk Street	· Road safety for students · Access delays, particularly at school pick up time (pm) · Competition for parking · Reduced amenity during outdoor play and sleep times
Rozelle civil and tunnel site (C5)	Outdoor recreation	Easton Park, Lilyfield Road, Rozelle	· Day-time noise exceedances anticipated (>11 dBA) · Vibration effects · Construction dust · Increased construction vehicles on Lilyfield Road	· Reduced road safety particularly around playground · Competition for parking · Reduced amenity

Construction site	Use type	Social infrastructure facility	Change to environment	Potential socio-economic effects
The Crescent civil site (C6)	Outdoor recreation	Glebe Foreshore Parks, Chapman Road, Glebe	· Vibration effects · Visual amenity changes (views to construction compounds across Rozelle Bay) · Local and arterial road alterations (Chapman Road and The Crescent)	· Reduced amenity · Reduced accessibility due to local and arterial road alterations
Iron Cove Link civil site (C8)	Educational facility	Rozelle Public School, 663 Darling St, Rozelle	· Day-time noise exceedances anticipated (>11 dBA) · Increased construction vehicles on Victoria Road	· Road safety for students · Student concentration capacity and productivity
Iron Cove Link civil site (C8)	Childcare centre	Rozelle Out of School Hour Care, 663 Darling St, Rozelle	· Day-time noise exceedances anticipated (>11 dBA) · Increased construction vehicles on Victoria Road	· Reduced amenity during outdoor play · Road safety
Iron Cove Link civil site (C8)	Outdoor recreation	King George Park, Manning Street, Rozelle	· Vibration effects · Day-time noise exceedances anticipated (>11 dBA) · Local road alterations · Increased construction vehicles	· Reduced amenity · Access delays and competition for parking, particularly when grounds are used for sport
Pyrmont Bridge Road tunnel site (C9)	Educational facility	Bridge Road School at 127 Parramatta Road, Camperdown	· Day-time noise exceedances anticipated (>11 dBA) · Construction dust · Increased construction vehicles · Vibration effects · Arterial road alterations	· Road safety for students · Access delays, particularly at school pick up time (pm) · Competition for parking · Reduced amenity during outdoor play · Student concentration capacity and productivity
Campbell Road civil and tunnel site (C10)	Outdoor recreation	Sydney Park	· Day-time noise exceedances <11 dBA)	· Slight reduction in amenity

As identified in **section 5.2**, there are a number of other social infrastructure facilities (not listed in the above table) within close proximity to the construction sites. There is a possibility that these facilities may experience a small change to the baseline socio-economic environment. The possible effects may include:

· A slight reduction in accessibility due to the increase number or construction vehicles or temporary road alterations

· An increase in competition for parking, particularly around facilities that attract larger numbers of people for a longer duration of time, such as places of worship, schools and sporting facilities

- Small changes to amenity, mostly to do with changes in the visual landscape, noise or dust (dependent on wind direction).

To minimise the consequence and likelihood of impacts on social infrastructure, a Social Infrastructure Plan is recommended to manage, minimise and avoid potential construction effects. The Plan should to be prepared before construction with the following provisions recommended for inclusion:

- Identify social infrastructure that has the potential to be adversely affected by construction activities
- Develop, in consultation with the owners of the identified social infrastructure, measures that could be implemented to maintain appropriate vehicular and pedestrian access, management measures for noise exceedances and safety measures, particularly around areas where children are present.

The Social Infrastructure Plan is recommended to be prepared by a suitably qualified and experienced person in consultation with the community and relevant councils and implemented as part of the project.

Although 17 social infrastructure facilities are likely to experience a change to the baseline socio-economic condition, in terms of the spatial extent of construction impact, effects are relatively localised. The duration of possible effects would be for a medium-long term with the severity of change from the existing baseline condition medium for facilities in close proximity, to small for those further away. There is a high likelihood that construction effects would influence the operation of some social infrastructure facilities and the experience of users. The likelihood and consequence of potential impact on social infrastructure would reduce the further the facility is from the construction site. Considering this, the overall significance of impact on the socio-economic environment is a moderate negative.

8 Assessment of operational impacts

The following sections provide an assessment of the potential socio-economic impacts (positive and negative) likely to occur due to the operation of the project. The assessment determines the consequence, likelihood and significance for impacts to occur and to identify measures to mitigate the negative impacts and enhance the benefits. The assessment considers impacts on:

- Access and connectivity
- Local amenity
- Community values
- Population and demography
- Economy.

A number of significant changes have been made to the project design following early public consultation. Some of the significant design changes developed have made positive adjustments to improve the operational project outcome. These include:

- Inclusion of Iron Cove Link into the project design
- Refinement to the design of the Rozelle interchange to be located predominantly below ground and largely to the north of Rozelle Rail Yards. This has enabled the opportunity for the creation of a significant open space area and active transport links (north–south and east–west) as a result of the undergrounding of transport infrastructure
- Removal of Camperdown ramps and realignment of the mainline tunnels further west/south
- Adjustment of the mainline tunnel from three to four traffic lanes in each direction
- Selection of ventilation facility locations to minimise local air quality impacts on nearby receptors
- Adjustments to construction staging to enable the mainline tunnel to be operational one year ahead of the remainder of the project (ie the Rozelle interchange).

8.1 Access and connectivity

8.1.1 Road network

As identified in **section 5.3**, strategic, district and local centres are generally located near arterial roads. There are a number of reasons behind this concentration. Industries need to be located where they have a direct and easy access to their suppliers, customers and employees. As such, any alterations to the efficiency of the road network would have a noticeable impact on local and regional economic development (business location decisions etc.).

Strengthening the road network may also create and enhance equity, social cohesion and integration by giving a broader cross section of citizens access to the same opportunities. Efficient road networks may improve the ability for individuals to access education, employment, health care, entertainment or businesses.

Appendix H (Technical working paper: Traffic and transport) of the EIS identified the changes to the efficiency and connectivity of the road network, intersection performance and travel times that would occur across the study area, upon operation. This working paper has assessed the impacts of an operational project scenario at opening in 2023 and at ten years after opening in 2033, in accordance with *Roads and Maritime Traffic Modelling Guidelines 2013*.[43] This section utilises the findings from

[43] Includes NorthConnex, M4 Widening, M4 East, New M5 and the M4-M5 Link but assumes no Sydney Gateway, Western Harbour Tunnel, Beaches Link or F6 Extension.

the 2033 traffic scenario[44] to identify socio-economic impacts that would likely occur due to the operation of the project.

From a network productivity perspective, the addition of the M4-M5 Link would provide a significant overall benefit. As shown in **Table 8-1** an overall increase of 499,000 daily vehicle kilometres travelled (VKT) and a reduction of 46,000 daily vehicle hours travelled (VHT) on the road network are forecast. This means that more trips could be made on the network in a shorter time. The increase in VKT and reduction in VHT is mainly due to traffic using the new motorway, with reductions in daily VKT and VHT forecast on the non-motorway roads.

Table 8-1 Comparison of daily VKT ('000 km) and VHT ('000 hours) for metropolitan Sydney under future 2033 scenario

	2033 Without the project		2033 With project		Change	
	VKT ('000 km)	VHT ('000 hrs)	VKT ('000 km)	VHT ('000 hrs)	VKT ('000 km)	VHT ('000 hrs)
Motorway	31,029	592	32,014	603	985	-11
Other	**101,901**	**4,670**	**101,415**	**4,613**	**-486**	**-57**
Total	132,930	5,262	133,429	5,216	499	-46

Table 8-2 identifies the percentage changes in daily VKT, VHT and average speeds in 2033, with and without the project, within the LGAs that are closest to the project. All LGAs, apart from the former Botany Bay LGA, would benefit from reduced traffic on surface roads. The increase in VKT and VHT in the former Botany Bay LGA are likely to be due to forecast increases in daily traffic on surface roads between the St Peters interchange and Sydney Airport.

Table 8-2 Change in daily travel distance, time and average speed by LGA in 2033

LGA	Daily VKT	Daily VHT	Daily Average Speed
Former Botany Bay	5%	13%	-7%
Burwood	-2%	-3%	1%
Canada Bay	-1%	-1%	0%
Canterbury-Bankstown	-1%	-4%	3%
Inner West	-11%	-21%	14%
Former Rockdale	0%	-1%	1%
Strathfield	-1%	-4%	3%
City of Sydney	-2%	-2%	0%

Table 8-3 identifies socio-economic benefits of efficient road networks for individuals and businesses. Social infrastructure is also likely to benefit from the improved network performance, such as improved reliability for emergency services and improved access to community facilities.

Table 8-3 Advantages of good road networks

Businesses	Individuals
· Flexibility · Accessibility · Security · Reliability · Minimised transit time · Improved competitiveness · High quality transportation for premium goods	· Flexibility · Individual treatment · Personal security · Meets family needs · Minimised travel time · Essential in rural or peri-urban areas · Comfort and privacy

Source: European Automobile Manufacturers Association (ACEA), July 1999

[44] The 2033 scenario has been chosen as it is a requirement of the SEARs and the Roads and Maritime Traffic assessment guidelines A traffic impact analysis has been undertaken to assess the impact of a project only scenario at opening (2023) and ten years after opening (2033), as required in the Roads and Maritime assessment guidelines,

The effect of the project would be long-term and have the capacity to affect a large number of people and businesses across the Greater Sydney Region. The change from the existing baseline environment would be large. The consequence would be major and likelihood would be near certain. Therefore, the significance of effect is considered to be major positive.

In relation to interchange performance, **Table 8-4** identifies the percentage change (without project vs with project) to the network performance at Wattle Street, Rozelle and St Peters interchanges, in 2033 for the AM and PM peak periods between the with and without project scenarios. These interchanges would provide new connectivity with existing roads.

Table 8-4 Wattle Street, Rozelle, St Peters interchange network performance (percentage change for 2033 without project vs 2033 with project scenarios)

Average per vehicle in network	Wattle Street interchange network		Rozelle interchange network		St Peters interchange network	
	AM	PM	AM	PM	AM	PM
Average vehicle kilometres travelled in network (km)	-20%	-8%	14%	20%	11%	-1%
Average time travelled in network (mins)	-46%	-33%	-9%	-25%	-36%	58%
Average number of stops	-43%	-47%	-23%	-47%	-30%	39%
Average speed (km/h)	47%	38%	26%	59%	73%	-38%

The project is forecast to improve overall road network performance, with lower average travel times, fewer number of stops and higher average speed. This means a higher number of vehicles would reach their destination in less time and experience less congestion. These improvements are expected to be experienced at the Wattle Street and Rozelle interchange in both AM and PM peak and St Peters in AM peak.

Despite overall network improvements, St Peters interchange and surrounds are forecast to experience increased congestion and delays during the PM peak. The forecast in traffic growth for the St Peters interchange and surrounds is expected to cause delays and increase congestion for users. Negative socio-economic impacts associated with delays and congestion include reduced safety, health impacts, reduced amenity and community cohesion.

The associated socio-economic impacts at St Peters would be medium-long term and would have the capacity to affect a large number of people and businesses across the Greater Sydney Region. Variances from the existing baseline environment would be large and socio-economic impacts would be possible. Therefore, the significance of effect is considered to be moderate negative.

To mitigate the project impacts at the Wattle Street, Rozelle and St Peters interchanges, Roads and Maritime would undertake a Road Network Performance Review after 12 months of operation, in consultation with Transport for NSW and relevant councils. Strategies would also be developed to investigate and identify traffic management measures on the Frederick Street/Milton Street corridor, capacity improvements in the network, project staging options and demand management measures in the areas surrounding the Rozelle interchange. In addition, improvements would be expected when the proposed future Sydney Gateway and proposed future Western Harbour Tunnel and Beaches Link are completed.

Arterial and local road impacts

Table 8-5 identifies the local and arterial routes that are forecast to experience changes in traffic volumes due to the operation of the project in 2033. Changes to travel times along these roads would alter travel, local amenity and the amount of time individuals spend at business premises or recreational facilities. The screenline analysis refers to the boundaries set by the traffic and transport modellers to analyse directional and two-way traffic volumes, details of which are presented in **Appendix H** (Technical working paper: Traffic and transport) of the EIS.

The project would result in direct alterations to amenity (discussed in **section 8.2**), travel time and the amount of time individuals spend at business premises or social infrastructure facilities.

Table 8-5 Estimated traffic volumes (two way) on arterial and local roads as a result of the project (average weekday traffic)

East-west	2033 'without project'			2033 'with project'			Change	
	Volume of vehicles	Heavy vehicles	% Heavy vehicle	Volume of vehicles	Heavy vehicles	% Heavy vehicle	% of change all vehicles	% of change heavy vehicles
Ashfield-Haberfield precinct								
Lyons Rd	41,100	1900.00	5%	34,100	1360.00	4%	-17%	-28%
Leichhardt-Glebe precinct								
Norton Street	11,300	500.00	4%	9,700	120.00	1%	-14%	-76%
City West Link	66,000	4750.00	7%	53,600	2910.00	5%	-19%	-39%
Darley Rd	19,200	740.00	4%	19,400	740.00	4%	1%	0%
Marion St	7,700	110.00	1%	4,600	40.00	1%	-40%	-64%
Balmain Road	7,300	490.00	7%	5,900	380.00	6%	-19%	-22%
Catherine Street	9,500	400.00	4%	10,200	510.00	5%	7%	-28%
Johnston Street	16,000	600.00	4%	17,900	690.00	4%	12%	15%
Booth Street	8,500	80.00	1%	8,300	50.00	1%	-2%	-38%
Alexandria-Erskineville precinct								
Ross Street	14,300	800.00	6%	17,100	810.00	5%	20%	1%
Stanmore Road	38,300	2320.00	6%	32,700	1320.00	4%	-15%	-43%
Addison Road	8,700	400.00	5%	6,900	230.00	3%	-21%	-43%
Marrickville Road	18,100	890.00	5%	16,300	420.00	3%	-10%	-53%
King Street	24,100	990.00	4%	19,500	720.00	4%	-19%	-27%
Wyndham Street	25,600	1310.00	5%	24,600	1060.00	4%	-4%	-19%
Botany Road	35,200	1520.00	4%	34,800	1270.00	4%	-1%	-16%
All three precincts								
Parramatta Road	66,100	4130.00	6%	48,500	2110.00	4%	-27%	-49%
Outside of study precincts								
Elizabeth Street	24,000	730.00	3%	23,000	660.00	3%	-4%	-10%
Eastern Distributor	171,900	14270.00	8%	165,600	12630.00	8%	-4%	-11%
Gladesville Bridge	93,800	-	-	98,500	-	-	5%	
Sydenham Road	31,500	2590.00	8%	29,000	2010.00	7%	-8%	-22%
Sydney Harbour Bridge	206,400	-	-	208,100	-	-	1%	
Sydney Harbour Tunnel	122,600	-	-	120,400	-	-	-2%	
M4-M5 Link	-			169,400			-	

As identified above, the majority of roads are forecast to experience a reduction in vehicle volumes reflecting the overall road network improvements. This would result in direct and indirect socio-economic benefits for a large number of residents, businesses and social infrastructure facilities and users across the Greater Sydney Region. Reduced vehicle traffic speeds and volumes on local and arterial roads tend to:

- Make walking[45] and cycling[46] safer, more comfortable and more convenient. Improved walking and cycling conditions are particularly important for people with disabilities, the elderly, and children, who are more dependent on non-motorised travel, and often have difficulty crossing busy traffic
- Improve safety and reduce the severity of vehicle crashes, particularly those involving pedestrians and bicyclists[47]
- Increase the attractiveness and amenity of an environment
- Reduce business visibility, which may impact business revenue
- Increase neighbourhood interaction and in turn improve community connectivity and social cohesion.

Reduced traffic volumes and traffic speeds along local and arterial roads would have a varying effect on businesses, dependent on their sensitivity to amenity and dependency on passing trade. For example, a café that is likely to benefit from increased amenity, however, a service station may be more sensitive to a loss in passing vehicles.

The socio-economic effects of improvements to the arterial and local road network would be medium-long term and would have the capacity to affect a large number of individuals, social infrastructure and businesses within the Greater Sydney Region. Variances from the existing baseline environment would be moderate and socio-economic benefits would have a high likelihood of occurring. Therefore, the significance of effect is considered major positive.

While the overall network is expected to improve the project may negatively affect the amenity and accessibility of a number of residential properties, businesses and social infrastructure facilities where traffic volumes are predicted to increase. These are located within Annandale (Johnston and Catherine streets), Camperdown (Ross Street), Leichhardt (Darley Road) and north of the Iron Cove Bridge (Victoria Road/Gladesville Bridge).

Reduced localised network performance would not only directly affect properties along these streets, they may also result in some 'rat running' along surrounding streets as motorists seek alternate routes to avoid congested areas. Although these locations may be affected by increased traffic it would be likely to only affect a small of number of residential and business properties in the study area. **Appendix H** (Technical working paper: Traffic and transport) reports that while these roads are negatively affected on operation of the project, it is forecast that traffic volumes would ease when the WestConnex program of works and the proposed future Sydney Gateway, Western Harbour Tunnel and Beaches Link are completed. As such, the change from baseline conditions would be small, medium-long term, and confined to the suburbs of Annandale, Camperdown and Leichhardt. The consequence would be moderate with a low likelihood. Therefore, the significance of this impact is considered to be minor negative.

[45] Ellen Vanderslice, Portland Pedestrian Design Guide, Pedestrian Transportation Program, City of Portland (503-823-7004; www.trans.ci.portland.or.us), 1998.

[46] David L. Harkey, Donald W. Reinfurt, J. Richard Stewart, Matthew Knuiman and Alex Sorton, The Bicycle Compatibility Index: A Level of Service Concept, Federal Highway Administration (www.hsrc.unc.edu/research/pedbike/bci), 1998

[47] C.N. Kloeden, A.J. McLean, V.M. Moore and G. Ponte, Travelling Speed and the Risk of Crash Involvement, NHMRC (Adelaide; http://plato.raru.adelaide.edu.au/speed/index.html), 1998; Jack Stuster and Zail Coffman, Synthesis Of Safety Research Related To Speed And Speed Limits, FHWA No. FHWARD-98-154 (www.tfhrc.gov/safety/speed/speed.htm), 1998; "Pedestrian Safety," Oregon Bicycle and Pedestrian Plan, Oregon DOT (www.odot.state.or.us/techserv/bikewalk/planimag/pedestrn.htm).

Local road alterations

Road alterations may result in driver frustration and confusion by having to use unfamiliar roads or because the use of alternative roads may increase travel time. However, these effects are usually temporary as drivers become familiar and accustomed to new routes.

The Iron Cove Link surface works would create a permanent local road change, where Clubb Street would be closed at the intersection with Victoria Road. Despite this, property access would be maintained with efficient alternative routes available through Toelle, Manning and Callan streets.

Residents along Toelle, Manning and Callan streets are likely to experience minor increases in vehicles using these streets as an alternative to Clubb Street. The increase in the number of vehicles is small and unlikely to result in any discernible adverse impacts.

Road alterations would be long-term and localised. The change from the existing baseline environment would be small. The consequence of change would be moderate and with a low likelihood to result in socio-economic effects. As such, the significance of road alterations related impacts would be minor negative.

Heavy vehicle movements

Table 8-5 identifies the forecast travel patterns for heavy vehicles. Overall, the project would result in a reduction in the number of heavy vehicles on surface roads, as heavy vehicles utilise the M4-M5 Link. This would result in a major change from baseline conditions and with a high likelihood to improve amenity and community safety, health and well-being. The effects would be medium-long term and would benefit residents, businesses and community facilities located in the Inner West and City of Sydney LGA. The change from the existing baseline environment would be medium. The consequence of change would be moderate and the likelihood high. As such, the overall significance of impact on the socio-economic environment would be moderate positive.

Businesses along Parramatta Road, King Street, Marrickville Road and Sydenham Road are forecast to experience significant reductions in heavy vehicles of 20-50 per cent, which would result in improved amenity, shopping experience and in turn business revenue. The effects would be long-term, and would affect the local and regional economy. The change from the existing baseline environment would be medium. The consequence of change would be slight and the likelihood high. As such, the overall significance of impact on the socio-economic environment would be moderate positive.

While there is an overall decrease in daily heavy vehicle volumes on surface roads across the network, Johnston Street and Ross Street are forecast to experience an increase in heavy vehicles. This is likely to result in negative socio-economic impacts upon both residents and social-infrastructure users, Social infrastructure items that may be particularly sensitive negative amenity and safety impacts include:

- Health and age care facilities (eg Annandale Occasional Care, Annandale Nursing Home, St Basil's Sister Dorothea Village)
- Childcare centres (eg Toxteth Kindergarten) and Schools (eg Annandale Public School, Annandale North Public School and Forest Lodge Public School)
- Churches (eg Hunter Baillie Memorial Presbyterian Church, Village Church Annandale).

The project would result in a small, long-term change in baseline conditions and affect the suburbs of Annandale and Forest Lodge. The consequence of change would be moderate and the likelihood high. Therefore, the significance of effect on the socio-economic environment is considered moderate negative.

Summary of impact

Appendix H (Technical working paper: Traffic and transport) forecasts that the M4-M5 Link would improve network productivity across the Greater Sydney network. This means that more trips are expected to be made or longer distances travelled in the network, in a shorter time. This would also support the long-term economic growth of Sydney through improved motorway access and connections, linking Sydney's international gateways to key places of business. This effect on the

road network would be long-term and at a regional spatial extent. The consequence of change would be major and the likelihood almost certain. The significance of impact on the socio-economic would be major positive.

8.1.2 Pedestrian and cyclist network

A successful pedestrian and cyclist network provides infrastructure that enables convenient, safe and enjoyable walking and cycling trips. The socio-economic benefits from active transport networks include enhanced community connectivity, increased opportunities for social interaction and community cohesion, reduced car dependency and reduced cost of travel. Reducing car dependency may lower household costs (the average weekly cost of running a car in Sydney is $419 per week[48]), ease road congestion, and improves air quality, noise and health outcomes for individuals and the community.

A more active lifestyle results in numerous health benefits for the community, including maintaining a healthy weight and improved mental health. Improving the quality of the pedestrian and cyclist network encourages increased usage. Well designed, safe (eg separated from vehicles), well connected (eg to town centres, open space and other regional active transport networks) pedestrian and cycle routes are attractive to all members of the community. The Bays Run, which is a seven kilometres, shared pedestrian and cycle path around Iron Cove, is a case in point and is an extremely popular active transport route.

Community consultation identified that the protection and enhancement of the existing pedestrian and cycling network were key priorities. The following routes were considered to have major community value for commuter and recreational purposes:

- The Bay Run
- Glebe Foreshore
- Whites Creek to Buruwan Park
- Anzac Bridge cycleway
- Victoria Road shared path
- City West Link shared path.

The project has been designed to minimise impacts on existing recreational facilities. This is of particular note for the Glebe foreshore walks and the Bay Run which would be maintained or improved/extended upon operation.

Appendix N (Technical working paper: Active transport strategy) of the EIS identified that there is currently poor active transport connectivity:

- Between Rozelle and Balmain, as a result of Victoria Road, which is a highly trafficked arterial road
- Along the shared bike/pedestrian path on Victoria Road between the Iron Cove Bridge and Anzac Bridge. The path is of inadequate width, has an uneven surface and poor amenity due to proximity to traffic on Victoria Road. In addition, there is the potential for conflict between pedestrians and cyclists
- At Rozelle Rail Yards, which currently acts as a significant barrier between the communities of Annandale, Lilyfield and Rozelle. The barrier also includes City West Link and the light rail corridor.

In addition, the report highlights that the current active transport network is fragmented, planned by a number of agencies and has suffered from inadequate funding. Consequently, many gaps exist within the network. For example, there is a deficiency in regional north-south routes around the Rozelle Rail Yards and east-west routes around the Haberfield construction area.

[48] Australian Automobile Association, March to June 2016

The construction of the project would result in the removal of both the existing Victoria Road and City West Link pedestrian/cycle bridges. However, upon operation, as outlined in **Appendix N** (Technical working paper: Active transport strategy) of the EIS, these bridges would be replaced by two new pedestrian/cycle connections. This new infrastructure would not only preserve, but also improve the existing active transport connections, to be wider and not so close to the noise and pollution of traffic. Overall, the effect would be long-term at a suburb extent. The change from the existing baseline environment would be small. The consequence of change would be moderate and the likelihood low. As such, the overall significance of impact on the socio-economic environment would be minor positive.

Utilising existing plans, policies and outcomes of stakeholder consultation, **Appendix N** (Technical working paper: Active transport strategy) of the EIS makes recommendations in relation to additional active transport infrastructure required. **Table 8-6** identifies the active transport infrastructure that the project intends to deliver. The proposed cycle and pedestrian paths would form part of the operational program of works for both the SMC and other agencies[49], creating connections that have reasonable grades and widths and would be separated, where possible, from vehicular traffic.

Table 8-6 Active transport proposed to be delivered as part of the project

Route	Type	Approx. length	Benefits
Rozelle Rail Yards Link *Links the Bays Run, The Bays Precinct and the Greenway in the west to the Anzac Bridge and city in the east*	Shared underpass	150m	· Links the Anzac Bridge to The Bays Precinct to Lilyfield Road at the western end of Rozelle Rail Yards · Provides the junction connecting Rozelle Rail Yards and Victoria Road to The Bays Precinct · Provides north-south connectivity between Glebe and Annandale with Rozelle and Balmain · Provides a connection from Annandale and Leichhardt to The Bays Precinct via the Rozelle Rail Yards · Removes the need for an at-grade crossing at City West Link · Connects Lilyfield to the Rozelle Bay light rail stop · Designed to ensure crime prevention through environmental design and disability principles are met
	Shared path	1,000m	· Provides the link between Victoria Road and the Lilyfield Road at the Light Rail Depot
Victoria Road - Iron Cove Link *Links the northern suburbs of Drummoyne and Russell Lea and Chiswick to The Bays Precinct and the CBD*	Separated Cycle Way	250m	· Provides a separated shared path on the western side of Victoria Road from Iron Cove Bridge · Connects the eastern side of the Rozelle Rail Yards along Victoria Road to the intersection of Robert Street · Connects the existing retail centres on Darling Street and Victoria Road as well as social infrastructure and active and passive recreation facilities
	Separated Cycle Way	450m	· Links the intersection of Springside Street to the Iron Cove Bridge and the Bay Run
	Bridge	200m	· Connects Victoria Road to the Crescent over Rozelle Rail Yards · Connects to Rozelle Bay light rail stop · Provides north-south connectivity between Glebe and Annandale with Rozelle and Balmain
	Shared Path	400m	· Connects Victoria Road to The Crescent
	Shared	500m	· Connects The Crescent to James Craig Road existing

[49] Inner West Council, RMS and Sydney Water.

Route	Type	Approx. length	Benefits
	Path		shared path
Whites Creek Link *Links Parramatta Road to the Rozelle Rail Yards and onto Callan Park*	Bridge	200m	· Links the intersection of Brenan Street and Railway Parade over or under City West Link connecting to the Rozelle Rail Yards Link · Links residential communities in Annandale and Lilyfield · Addresses connectivity from Whites Creek to the Rozelle Rail Yards, crossing the existing light rail line and City West Link
Johnston Creek Valley Link *Extends the existing Johnston Creek pathway to connect Glebe Foreshore to Parramatta Road*	Bridge/Shared path	300m	· Connects Easton Park to The Crescent through the Rozelle Rail Yards · Addresses connectivity from Johnstons Creek to the Rozelle Rail Yards · Links Glebe Foreshore and parklands to the Rozelle · Rail Yards, Parramatta Road and The Bays Precinct
	Shared path	500m	· Connects The Crescent, Jubilee Park and the existing Glebe foreshore

The works outlined in the table above would provide substantial improvements to the existing active transport network, addressing important gaps. These improvements would directly benefit the residential communities of Rozelle, Lilyfield, and Annandale/Glebe, which are within the Leichhardt-Glebe precinct.

In relation to access and connectivity for pedestrian and cyclists, the project has the potential to positively affect the following socio-economic elements:

- Health outcomes
- Local amenity
- Social interaction/community severance
- Reduced travel costs and time.

This would occur through the facilitation of new or enhanced, safer movement patterns around the study area, linking pedestrians and cyclists to popular waterfront and open space areas, such as the proposed open space at Rozelle Rail Yards, Glebe foreshore, Easton Park, the Bays Run and King George Park in Rozelle. In addition, upgraded pedestrian and cyclist connectivity, as detailed in **Appendix N** (Technical working paper: Active transport strategy) of the EIS, would allow connectivity to, through and from The Bays Precinct Transformation Precinct. The active transport proposals to be delivered by the project would support the objectives within The Bays Precinct Transformation Plan to facilitate a world-class mass and active transport solution[50]. These improvements would encourage additional recreational and commuter users, benefiting all members of the community including persons with mobility impairments or families with young children.

The improvements would also have the potential to increase connectivity (and reduce community severance) between the communities of Rozelle, Balmain, Lilyfield, Annandale and Leichhardt as well as potentially providing increased patronage for businesses located on Victoria Road, Annandale Street and Darling Street. Walkers and recreational and commuter cyclists would enjoy improved amenity (reduction in noise and pollution) due to the location of routes further away from traffic, where possible.

Commuters would enjoy reduced travels costs and time savings to the Sydney CBD and other parts of the study area, benefiting from the provision of safer, well connected, dedicated pathways and

[50] UrbanGrowth NSW, October 2015, The Bays Precinct Sydney Transformation Plan

bridges, particularly along busy arterial roads such as Victoria Road, which is presently poorly serviced.

The proposed enhancements to the pedestrian and cyclist network would be long-term, benefiting the suburbs of Annandale, Leichhardt, Lilyfield, Rozelle and Balmain. In addition, such improvements would contribute positively to the regional active transport network with the potential to affect a wider catchment of people. The provision of these additional links may also act as a catalyst for improvements to other active transport networks further afield. The consequence of impact is major, with a high likelihood. Therefore, the significance of impact is considered a major positive.

8.1.3 Public transport network

A Plan for Growing Sydney[51] recognises the importance of ensuring housing is located in suitable locations with good access to public transport. This aims to minimise the impacts of travel on the environment, contribute to housing affordability, reduce travel costs, reduce congestion and improve quality of life for residents and workers.

This assessment concentrates on the bus network, as it is the public transport system most affected by the M4-M5 Link. However, it is recognised that access to the Rozelle light rail stop would improve upon operation of the project. The new/enhanced active transport routes through the Rozelle Rail Yards would provide access to a wider catchment, particularly to the residential areas to the north in Lilyfield.

Appendix H (Technical working paper: Traffic and transport) of the EIS identified that from a public transport network perspective the following changes in 2033 would be expected:

- The project demonstrates improvements in Parramatta Road bus travel times during the AM peak. This would be due to the forecast reductions in the surface road network traffic demand. In the PM peak, bus travel times along Parramatta Road are predicted to reduce, particularly for eastbound traffic, although it would also occur for westbound traffic. These improvements would reduce travel times and make a measureable change to baseline conditions, benefiting a large number of residents in Annandale, Leichardt and Camperdown
- In relation to the Rozelle interchange, longer city bound journey times in the AM peaks are forecast due to the congested traffic conditions over the Anzac Bridge, combined with increased demand to Bathurst Street and the Sydney Harbour Bridge. This would have a minor negative impact on the existing socio-economic environment. Mitigation measures for this impact have been addressed **Appendix H** (Technical working paper: Traffic and transport) and after implementation, the residual impact on the socio-economic environment would be negligible
- Outbound bus movements along Anzac Bridge/Victoria Road would improve in both the AM and PM peak periods. This improvement would reduce travel times and make a measureable change to baseline conditions, affecting a large number of residents in Lilyfield, Balmain and Rozelle.

Table 8-7 identifies the predicted long-term (2033) changes in travel times for buses due to the project.

Table 8-7 Changes to average travel time for buses predicted in 2033 due to the project (percentage change for 2033 without project vs 2033 with project scenarios)

Bus service/direction	AM peak hour average travel time minutes (approx.)	PM peak hour average travel time minutes (approx.)
Wattle Street interchange		
Parramatta Road (eastbound)	- 4.0	- 2.5
Parramatta Road (westbound)	0	- 1.0
Rozelle interchange		
Victoria Road/Anzac Bridge (city bound)	+ 1.5	-1.0

[51] NSW Department of Planning and Environment, 2014, *A Plan for Growing Sydney*

Bus service/direction	AM peak hour average travel time minutes (approx.)	PM peak hour average travel time minutes (approx.)
Anzac Bridge/Victoria Rd (outbound)	- 8.0	- 6.5
St Peters interchange		
St Peters	0	+ 2.5

The effect of operation on the public transport network would be medium term at an LGA extent. The change from the existing baseline environment would be small. The consequence of change would be slight and the likelihood possible. The significance of impact is considered minor positive.

The exception to this is the city bound route from Victoria Road across the Anzac Bridge and Western Distributor during the AM peak. The change from the existing baseline environment in this case would be small (+1.5 minutes). Effects would be medium-long term at a suburb extent. The consequence of impact would be slight and with a likelihood possible. The significance of impact is considered a minor negative.

8.1.4 Parking availability

Changes to parking availability may affect the daily routine of a resident or business, level of activity, passing trade or business operations. Permanent reductions in on-street parking may deter visitors from accessing a business or community facility due to an increase in travel time and lack of convenience and may affect the vibrancy of a centre. It may also affect convenience and accessibility for residents, particularly those who rely on on-street parking.

A notable number of businesses (18 per cent) identified concerns that the project, on operation, would have an adverse impact on customer and employee parking. This was a particular concern for businesses reliant on passing trade. The operation of the project would not reduce on street car parking in commercial centres.

The operation of the project would result in a permanent loss of 23 on-street parking spaces in Rozelle, including:

- Five at the north-east end of Byrnes Street
- Nine at the north-east end of Clubb Street
- Seven at the north-east end of Toelle Street
- Two at the north-east end of Callan Street.

The majority of parking spaces to be removed would be located outside of acquired properties and therefore would be unlikely to result in any negative impact on the socio-economic environment. The effect would be long-term and at a locality extent. The consequence would be would be moderate with a rare likelihood of resulting in socio-economic impacts. As such, the significance of residential parking related impacts would be negligible.

Whilst the project would formalise the currently informal parking spaces at King George Park in Rozelle it is not expected that the number of available parking spaces would change overall. Formalising the car park would however improve the safety and efficiency of car parking arrangements at this location.

Overall, the effect of operation on parking at King George Park would result in small changes to existing baseline conditions. The effects would be long-term and affect residents within the Inner West LGA. The likelihood of improving safety and efficiency would be possible. Therefore, the overall significance of impact would be minor positive.

8.2 Local amenity

The following section outlines the effect of the presence of the project upon local amenity during operation. This assessment draws upon other relevant sections of the M4-M5 Link EIS, including noise and vibration, air quality and visual amenity. These elements, together and separately, affect local amenity through their influence on the quality of a place, its appearance/character, ambience,

and the way the community (both residents and visitors) experience their environment. This subsequently affects how and where people choose to live, shop and spend recreation time.

8.2.1 Landscape character and visual amenity

The operation of the project would result in changes to landscape character and visual amenity due to the presence of new and enhanced infrastructure, landscaping and other urban design features. Changes to the landscape character or the visual amenity of a street or suburb may affect the sense of belonging and identity of its residents and visitors and consequently community cohesion.

Appendix O (Technical working paper: Landscape and visual impact) of the EIS provides an assessment of the landscape character and visual impacts associated with the operation of the project. The potential impact of landscape character upon local amenity is discussed below.

Landscape Character

Appendix O (Technical working paper: Landscape and visual impact) of the EIS identifies a total of 33 Landscape Character Zones (LCZs) that have the potential to be affected by the surface components of the project. The assessment found that, upon operation of the project, four LCZs would be subject to high-moderate impacts, and four would be subject to high-moderate impacts as identified in **Table 8-8.**

Table 8-8 Landscape Character Zones (LCZs)

Significance of Impact	Landscape Character Zones (LCZ)	Project effects	Sensitive receivers
High-Moderate	LCZ 13 – Easton Park residential precinct	While there would be no physical change or addition of project elements within this LCZ, the proposed ventilation facility and outlets would comprise a new and uncharacteristic element in the outlook in terms of scale, mass and form of the structures.	· Residents within the suburb of Rozelle, particularly those to the south towards Lilyfield Road · Recreational users of Easton Park, O'Connor Reserve and Rozelle Commons · Businesses along Victoria Road.
	LCZ 15 – White Bay Power Station precinct (State heritage listed item)	The existing Victoria Road bridge (identified as a potential local heritage item) would be demolished and replaced with a new structure. The Proposed planting of trees along Victoria Road south of power station would seek to minimise the visual impacts of the road infrastructure on the White Bay Power Station precinct. It is recommended that future planting in this area be undertaken in consultation with UrbanGrowth NSW to ensure a balanced outcome is achieved from a visual/landscape, heritage and active transport perspective.	· Future residents and visitors to The Bays Precinct · Pedestrians and cyclists along Victoria Road · Businesses along Victoria Road.
	LCZ 24 – Callan Park	The alterations of the	· Recreational users of

Significance of Impact	Landscape Character Zones (LCZ)	Project effects	Sensitive receivers
	residential precinct	'protective' built form edge (from the demolition of properties along the southern side of Victoria Road) which, currently provides visual and noise protection from the road corridor. Some residences may experience increased views to Victoria Road. Land in this location that is not required for the operation of the project would be subject to future landscaping as outlined in the Urban Design Landscape Plan (ULDP) to be prepared in consultation with the local community.	King George Park · Residents along Byrne, Callan, Springside and Toelle streets.
	LCZ 30 – Barwon Park Road precinct	The ventilation facility proposed as part of the M4-M5 Link project would contribute to a substantial change in the outlook and backdrop.	· Recreation users of Sydney Park · Residents along Barwon Park Road and Euston Road.

The suburbs of Rozelle and St Peters would experience the most noticeable change in the landscape character and visual amenity of the environment as outlined in the table above.

Visual Impact

Appendix O (Technical working paper: Landscape and visual impact) of the EIS assessed a total of 18 locations for visual impacts. The built form components of the project would result in alterations to existing views for a number of residential properties. Some of these views would be altered due to the addition of built components of the project to the environment, including:

- Ventilation facilities and outlets
- Water treatment plants
- Electricity sub stations
- Air intake facilities
- Tunnel portals.

Table 8-9 identifies the locations that would be subject to High and High-Moderate visual impacts as identified in **Appendix O** (Technical working paper: Landscape and visual impact) of the EIS.

Table 8-9 Receptors identified as having High and High-Moderate impacts

Significance of impact	Receptors	Project effects	Sensitive receivers
High	Free-standing dwellings located on Foucart Street near the corner of Lilyfield Road	A low and potentially moderate number of these visual receptors would have the potential for the city skyline view to be interrupted by the ventilation facility.	· Residents along Foucart Street near corner of Lilyfield Road
	Residences within the vicinity of	A low and potentially moderate number of these visual receptors have the	· Residents along Hutcheson street

Significance of impact	Receptors	Project effects	Sensitive receivers
	Hutcheson Street and Denison Street near Lilyfield Road	potential for the city skyline view to be interrupted by the ventilation facility.	and Denison Street near Lilyfield Road
High	**R5 - Rozelle Rail Yards** View looking south from Easton Park to the project	Alterations to current views in response to the height and scale of the ventilation facility. The residences most impacted are around 300 metres from the ventilation facility, and are separated by some of the land within the Rozelle Rail Yards, Lilyfield Road and Easton Park.	· Residents in close proximity to Easton Park
	R7 - Rozelle Bay light rail stop Views looking north towards the project	The operation of the project would result in a change in view to the north, where the project would introduce new visual elements associated with the scale and contrasting form of the ventilation facility in the background, and the new pedestrian bridge in the foreground. The ventilation outlets would be highly visible given the removal of existing trees adjacent to the light rail stop, which currently provide visual screening from this outlook. However, landscaping has been recommended around all fixed infrastructure within the new parkland, which would provide screening of night lighting impacts viewed from this location. Increased night lighting impacts are also anticipated due to removal of screening vegetation at intersection of The Crescent/City West Link as viewed from multiple locations within nearby streets such as Bayview Crescent and Railway Parade, in contrast to the existing generally well screened and visually contained environment of Annandale.	· Pedestrians and cyclists
	IC4 - Iron Cove Link View looking south along Terry Street towards project	The proposed ventilation outlet would encroach into the existing view seen from apartment balconies, partly obscuring distant views to Callan Park.	· Residents along the west side of Terry Street
High -Moderate	**R5 - Rozelle Rail Yards** View looking south from Easton Park to the project	Alterations to current views in response to the height and scale of the ventilation facility. Recreational users, while experiencing a change in view, are temporary visitors to the area and would have shorter viewing durations of the project.	· Recreational users of Easton Park

Significance of impact	Receptors	Project effects	Sensitive receivers
	R6 - Rozelle Rail Yards View looking north from Glebe Foreshore Parklands to the project	Visual impacts to recreational users are anticipated, with a change to the current view across Rozelle Bay. This view currently includes the existing City West Link and other significant infrastructure such as working port areas, White Bay Power Station, Glebe Island grain silos and Anzac Bridge. Visual impacts relate to the inability to screen a significant length of the project along the Victoria Road intersection, along the south side of City West Link between Anzac Bridge and James Craig Road. While the ventilation outlets would comprise of contrasting elements within the immediate context, the separation distance and the overall extent of this view, would increase the capacity for the landscape to visually absorb these elements.	· Recreational users of Glebe Foreshore Parklands
	R7 - Rozelle Bay light rail stop Views looking north towards the project	*See effects outlined for R7 above.*	· Residents at Bayview Crescent · Users of Rozelle Bay light rail
	IC4 (Iron Cove Link) View looking south along Terry Street towards the project	The proposed ventilation outlet would encroach into the existing view seen from apartment balconies, partly obscuring distant views to Callan Park.	· Residents – Nagurra Place: south side

The operation of the project would result in potential alterations to views of the city skyline and partial loss to Rozelle Bay or Glebe Point. These alterations to views may have direct impacts on the amenity of the location and quality of life. However, new transport infrastructure would improve views for numerous properties in Lilyfield who presently overlook the industrial buildings and the Rozelle Rail Yards.

Overall, the impact on views would be medium-long term and affect a small number of residents in Rozelle. The change from baseline conditions would be small. The consequence of impact would be slight and the likelihood possible. Therefore, the significance of impact on the local socio-economic environment would be minor negative.

In addition, **Appendix O** (Technical working paper: Landscape and visual impact) of the EIS outlines that a landscape and visual impact mitigation strategy would be provided for the project to avoid, reduce and manage identified potential landscape and visual impacts during operation. This would include:

- The provision of substantial mature and semi-mature street-tree planting for screening and shade, and mixed sizing of planting where stratification of the canopy is desired
- The provision of high quality finishes to buildings and vent facilities to facilitate long term durability of the design for effect with minimal maintenance, eg use of hard rock rather that concrete with a pigment which may fade over time
- Improvement of open space to offset additional infrastructure, eg provision of street trees to adjoining local streets affected by the project
- Improvement of active transport links to reduce reliance on motorway and local roads for short journeys.

The visual character and identity of Rozelle, Lilyfield and St Peters would be altered from the baseline condition. However, the project has considered design options and a landscape and visual impact mitigation strategy would be implemented to enhance the visual character of the most affected areas. The changes from baseline conditions would be large. The effects would be long term and affect the Inner West LGA. The consequence would be major. However, the likelihood of adverse socio-economic affects would be low. Therefore, the significance of impact on the socio-economic environment would be minor negative.

8.2.2 Noise and vibration

Community consultation identified key concerns regarding changes to environmental noise and vibration due to the operation of the project. Concerns regarding operational noise and vibration were raised by 14 per cent of business survey respondents.

Exposure to environmental noise from traffic-related sources is reportedly the most annoying of all urban pollution types, interfering with enjoyment of daily activities and potentially affecting sleep and rest patterns[52]. It may also affect the function of social and business services (both positively and negatively), especially those that are dependent on a quiet environment (such as beauticians, health centres or outdoor dining areas).

Appendix K (Technical working paper: Human health risk assessment) of the EIS identified the following short and long-term health impacts that may result from increased environmental noise:

- Sleep disturbance
- Annoyance
- Hearing impairment
- Interference with speech and daily activities
- Children's school performance (through effects on memory and concentration)
- Cardiovascular health (elevated blood pressure).

Other effects for which evidence of health impacts exist, but for which the evidence is weaker, include:

- Mental health (exacerbation of existing issues) (usually in the form of exacerbation of existing issues for vulnerable populations rather than direct effects)
- Tinnitus (which may also result in sleep disturbance, anxiety, depression, communication and listening problems, frustration, irritability, inability to work, reduced efficiency and a restricted participation in social life)
- Cognitive impairment in children
- Indirect impact on the immune system.

The World Health Organization (WHO) estimates that more than one million healthy life years are lost every year in western Europe due to noise exposure.[53] The transport sector is a contributor to society's noise problem with road traffic being the largest single source of noise in the transport sector. The combination of increasing traffic volumes and urbanisation means that the problem would increase if no measures were taken to mitigate it[54].

[52] Dinno A, Powell C, King MM. A study of riders' noise exposure on a bay area rapid transit trains. J Urban Health. 2011;88:1–13.

[53] Babisch W, Bäckman A, Basner M et al Burden of disease from environmental noise. Bonn: WHO European Centre for Environment and Health 2011

[54] Henrik Andersson, Lina Jonsson, Mikael Ögren. Benefit measures for noise abatement: calculations for road and rail traffic noise 2013

Noise issues in NSW are managed by the NSW Environment Protection Authority (NSW EPA). The NSW EPA issued the *NSW Road Noise Policy* (RNP) in 2011. The *Noise Criteria Guideline* (NCG) (Roads and Maritime, 2015) and *Noise Mitigation Guideline* (NMG) (Roads and Maritime, 2015) are consistent with the RNP and have been used to assess the operational road traffic noise. Noise from operation of proposed fixed operational facilities is assessed with guidance from the *NSW Industrial Noise Policy* (INP) (NSW EPA, 1999).

There is discussion in these policies of the need to balance the economic and social benefits of activities that may generate noise with the protection of the community from the adverse effects of noise. The noise assessment criteria adopted relate to levels of noise that may be tolerated or permitted above background before some adverse effect (annoyance, discomfort, sleep disturbance or complaints) occurs.

Appendix J (Technical working paper: Noise and vibration) of the EIS presents the NCG road traffic noise assessment criteria for residential land uses and social infrastructure. This is shown in **Table 8-10** and **Table 8-11** respectfully.

Table 8-10 Road traffic noise assessment criteria for residential land use

Road category	Type of project/land use	Assessment criteria (dBA)	
		Daytime (7 am - 10 pm)	Night-time (10 pm - 7 am)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from new freeway/arterial/sub-arterial road corridors	$L_{Aeq(15hour)}$ 55 (external)	$L_{Aeq(9hour)}$ 50 (external)
	2. Existing residences affected by noise from redevelopment of existing freeway/arterial/sub-arterial roads 3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq(15hour)}$ 60 (external)	$L_{Aeq(9hour)}$ 55 (external)
	4. Existing residences affected by both new roads and the redevelopment of existing freeway/arterial/sub-arterial roads in a Transition Zone[1]	Between $L_{Aeq(15hour)}$ 55-60 (external)	Between $L_{Aeq(9hour)}$ 50-55 (external)
	5. Existing residences affected by increases in traffic noise of 12dBA or more from new freeway/arterial/sub-arterial roads	Between $L_{Aeq(15hour)}$ 42-55 (external)	Between $L_{Aeq(9hour)}$ 42-50 (external)
	6. Existing residences affected by increases in traffic noise of 12dBA or more from redevelopment of existing freeway/arterial/sub-arterial roads	Between $L_{Aeq(15hour)}$ 42-60 (external)	Between $L_{Aeq(9hour)}$ 42-55 (external)
Local roads	7. Existing residences affected by noise from new local road corridors.	$L_{Aeq(1hour)}$ 55 (external)	$L_{Aeq(1hour)}$ 50 (external)
	8. Existing residences affected by noise from redevelopment of existing local roads		
	9. Existing residences affected by additional traffic on existing local roads generated by land use developments		

Note 1: L_{eq} is the preferred method to describe sound levels that vary over time, resulting in a single decibel value, which takes into account the total sound energy over the period of time of interest.
Note 2: L_{Aeq} - It is common practice to measure noise levels using the A-weighting setting built into all sound level meters. In which case the term is properly known as L_{Aeq}.

Table 8-11 Social infrastructure criteria

Existing sensitive land use	Assessment criteria (dBA)[1]		Additional considerations
	Daytime (7.00 am – 10.00 pm)	Night-time (10.00 pm – 7.00 am)	
School classrooms	$L_{Aeq(1hour)}$ 40 (internal)	-	In the case of buildings used for education or health care, noise level criteria for spaces other than classrooms and wards may be obtained by interpolation from the 'maximum' levels shown in Australian Standard 2107:2000 (Standards Australia 2000).
Places of worship	$L_{Aeq(1hour)}$ 40 (internal)	$L_{Aeq(1hour)}$ 40 (internal)	The criteria are internal, ie the inside of a church. Areas outside the place of worship, such as a churchyard or cemetery, may also be a place of worship. Therefore, in determining appropriate criteria for such external areas, it should be established which activities in these areas may be affected by road traffic noise.
Open space (active use)	$L_{Aeq(15hour)}$ 60 (external) when in use	-	Active recreation is characterised by sporting activities and activities, which generate their own noise or focus for participants, making them less sensitive to external noise intrusion.
Open space (passive use)	$L_{Aeq(15hour)}$ 55 (external) when in use	-	Passive recreation is characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, eg playing chess, reading.
Childcare centres	Sleeping rooms $L_{Aeq(1hour)}$ 35 (internal) Indoor play areas $L_{Aeq(1hour)}$ 40 (internal) Outdoor play areas $L_{Aeq(1hour)}$ 55 (external)	-	Multi-purpose spaces, eg shared indoor play/sleeping rooms should meet the lower of the respective criteria. Measurements for sleeping rooms should be taken during designated sleeping times for the facility, or if these are not known, during the highest hourly traffic noise level during the opening hours of the facility.
Aged care facilities	-	-	Residential land use noise assessment criteria should be applied to these facilities.
Hospital wards	$L_{Aeq(1hour)}$ 35 (internal)	$L_{Aeq(1hour)}$ 35 (internal)	-

Appendix J (Technical working paper: Noise and vibration) of the EIS discusses operational noise modelling undertaken to assess the impact of the project. The assessment evaluated impacts on the community 600 metres either side of the project alignment, as well as the community adjacent to a number of collector roads, sub-arterial and arterial roads associated with Victoria Road, City West Link and The Crescent.

The project upon operation is expected to reduce the number of receivers with an exceedance of the NCG criteria within the study area, in both the day and night-time periods. This is mainly due to the displacement of traffic from surface roads into the new tunnels.

These reductions are identified along sections of Victoria Road in Rozelle where the project is forecast to reduce traffic numbers. This section of road is predominantly commercial. The reduced noise levels would likely improve the ambiance of the outdoor and indoor environment, therefore potentially increasing the number of visitors and passing trade.

Similarly, residents and businesses located adjacent to a number of other surface roads, particularly City West Link, Parramatta Road and The Princes Highway would benefit from the anticipated reduction in traffic volumes, resulting in improvements in the noise environment and in turn, health outcomes (eg less sleep disturbance).

While there is an overall decrease in noise volumes across the network, **Appendix J** (Technical working paper: Noise and vibration) of the EIS has identified that 200 individual buildings within the study area would be expected to have exceedances of operational road traffic noise criteria both in day and night times. These buildings would experience noise increases of over 2dBA and as a result would be eligible for noise mitigation measures.

Of these 200 properties, 173 are residential and the remaining 27 are businesses or social infrastructure. The majority of these properties already experience exceedances of acceptable noise levels due to the presence of existing road traffic.

Increases in noise have been identified in parts of the study area, such as parts of Johnston Street, where traffic volumes are expected to increase. Increases were also identified in Iron Cove, to the south of Victoria Road (Byrne Street, Clubb Street, Toelle Street, Callan Street and Springside Street), where the noise shielding effect of the row of buildings facing Victoria Road would be removed due to property acquisitions and subsequent demolition.

Residents in these locations would be more exposed to health risks associated with increased environmental noise. These would include general annoyance (eg having to keep windows closed), sleep disturbance, and interference with household activities (eg outside eating).

Mitigation measures, such as noise barriers, would be provided as part of the project, which would reduce noise impacts. **Appendix J** (Technical working paper: Noise and vibration) of the EIS has identified four barrier sections, located to the south of Iron cove and at The Crescent which may reduce noise for triggered receivers. These noise barriers would be subject to detail deign. In addition, at-property acoustic treatment would be considered for eligible properties where noise exceedances were still predicted.

The effect of operational noise would be medium-long term at a locality extent. The change from existing baseline environment would be small. The consequence of change would be slight and the likelihood possible. As such, the overall significance of impact on the socio economic environment would be a minor negative.

Social infrastructure facilities may be particularly sensitive to health and amenity impacts associated with noise exceedances. These would include health and age care facilities, childcare and educational facilities, places of worship and active and passive open space. The following facilities would be eligible for consideration for noise mitigation measures:

- Health and age care facilities (Balmain Sports Medicine, Well Adjusted Chiropractic)
- Childcare centres (Rosebud Cottage Childcare Centre, Ku Phoenix Preschool)
- Schools (St Scholastica's College, Rozelle Public School)
- Tertiary education facilities (Sydney Community College, Sydney College of The Arts)
- Place of worship (Sze Yup Temple)
- Active and passive open space (Bayview Crescent).

Although the existing background noise levels are generally high and dominated by existing road traffic noise, the increased noise levels may affect a person's capacity to concentrate in educational facilities. Increased environmental noise level at open space may also reduce person's desire or ability to exercise or engage in other recreational actives. This may result in adverse effects on cardiovascular health and community cohesion.

Summary of impacts

Once operational the project is predicted to result in a reduction in noise levels for around 60 per cent of the receivers within the study area and a reduction the number of receivers with an exceedance of the NCG criteria within the study area, in both the day and night-time periods. Effects would be medium-long term and would affect residents, businesses and social infrastructure in the Inner West LGA, and visitors to businesses and social infrastructure from across Greater Sydney Region. The change from the existing baseline environment would be small. This consequence would be slight and the likelihood high. As such, the impact is considered to be a moderate positive.

Only 200 buildings have been identified as likely to have exceedances of operational road traffic noise criteria both in daytime and night-time. These buildings currently experience exceedances of acceptable noise levels due to the presence of existing road traffic. Mitigation measures are expected to be implemented to reduce noise levels for these properties. The effect upon these buildings would be medium-long term and likely to affect residents, business, social infrastructure and visitors across Greater Sydney Region. The consequence of change would be moderate with a high likelihood. As such, the significance of impact is considered to be a moderate negative.

Vibration

Appendix J (Technical working paper: Noise and vibration) of the EIS has not identified any increased vibration impacts associated with the operation of the project. Operational ground-borne noise and vibration due to the movement of cars and trucks inside the tunnel is not expected to cause any noticeable impact at the surface level properties. Therefore, upon operation, the significance of impact on the existing socio-economic environment would be negligible.

8.2.3 Air quality and ventilation

Appendix I (Technical working paper: Air quality) of the EIS considers changes to air quality as a result of the project. The emission sources relevant to the project addressed in the air quality modelling included:

- Emissions from the traffic on the surface road network, including new roads associated with the project
- Emissions from proposed ventilation outlets.

The assessment identifies the net change in air quality as it relates to emissions from environmental pollutants such as polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) that may have a detrimental effect on air quality and therefore adversely affect community health, and local amenity.

Particulate matter from emissions has been linked to adverse health effects after both short-term exposure (days to weeks) and long-term exposure (months to years). The health effects associated with exposure to particulate matter vary widely (with the respiratory and cardiovascular systems most affected).

External Air Quality

Appendix K (Technical working paper: Human health risk assessment) of the EIS identifies the potential health impacts associated with changes in air quality due to the operation of the project. The human health assessment concluded that there no acute or chronic health risks to local communities that would arise as part of the project. Conversely, the project would be expected to result in a decrease in total pollutant levels within the study area due to the redistribution of vehicle emissions, specifically in relation to emissions derived from vehicles currently using surface roads. For much of the community this would result in no change or a small improvement to the existing environment. The significance of impact on the socio-economic environment would be negligible.

Internal Air Quality

The quality of air for people travelling within the tunnels was identified as a key concern during community consultation. The Human health risk assessment concluded that:

- Where windows are up and ventilation is on recirculation, exposure to nitrogen dioxide inside vehicles is expected to be below the current health based guidelines. In congested conditions inside the tunnels, it is not considered likely that significant adverse health effects would occur
- For motorcyclists, where there is no opportunity to minimise exposures through the use of ventilation, there is the potential for higher levels of exposure to nitrogen dioxide and particulates. These exposures, under normal conditions, are not expected to result in adverse health effects. When the tunnels are congested it is expected that motorcyclists would spend less time in the tunnels than passenger vehicles and trucks, limiting the duration of exposure and the potential for adverse health effects
- For individuals who regularly use tunnels for commuting or as part of their employment there is the potential for repeated exposures to higher levels of nitrogen dioxide and particulates during the day. While these exposures are not likely to be additive, in terms of potential health effects, it is important that these road users utilise ventilation on recirculation whenever they are using the tunnels
- Where advice is provided (and is followed) to place ventilation on recirculation when using project tunnels the levels of carbon dioxide inside vehicles are not expected to adversely affect the health of occupants.

During operation, changes to air quality both inside and outside of the tunnel would result in no discernible positive or negative effects to human health or local amenity. Therefore, air quality impacts on the socio-economic impacts would be negligible.

8.3 Future land use

All land that is required for construction and/or operation of the project is identified as project land in the EIS. This includes:

- Properties to be acquired
- Properties to be leased
- Government owned properties (already owned or would be acquired or leased). This includes Roads and Maritime owned land.

Land required for the construction of the project that is not required for operation would be identified following detailed design and construction planning and is termed ‘remaining project land’ and would then be broken down further into:

- Land to be retained for future (separate) road infrastructure projects
- Residual land – land required for the construction of the project that is not required for operation or for future (separate) infrastructure projects.

The uncertainty around this future land use may cause residents and business stress and/or anxiety. This speculation and uncertainty may affect where an individual or business chooses to live or operate. Remaining project land would be identified in the Residual Land Management Plan.

The Residual Land Management Plan would be prepared in consultation with the relevant council and would identify (and consider) but not be limited to:

- Identification and illustration of all remaining project land, including the location, land use characteristics, size and adjacent land uses
- Identification of feasible uses for remaining project land including justification for the selected use
- Timeframes for implementation of the actions in relation to the identified feasible uses.

Land subject to the Residual Land Management Plan includes Parramatta Road West civil and tunnel site (C1b), the Parramatta Road East civil site (C3b) and Pyrmont Bridge Road tunnel site (C9).

Future use would be decided by Roads and Maritime, and any future development would be subject to separate development assessment and approval. Of note is that the project would not rezone or consolidate remaining project land and therefore there would be no changes to land use zoning for future development.

As presented in **Appendix L** (Technical working paper: Urban design) of the EIS detailed landscape plans would be prepared as part of the Urban Design and Landscape Plan (UDLP) for the project. Land subject to the UDLP includes Darley Road surface works, Rozelle surface works, Iron Cove Link surface works and the land around the motorway operations complex at St Peters.

8.3.1 Darley Road surface works

A permanent land use change would occur at Darley Road construction ancillary facility, as the western portion of the site would be used for a motorway operations complex, including a water treatment plant and substation. The remainder of the site would be rehabilitated and its future use outlined in the Residual Land Management Plan.

The site is in close proximity to the existing transport infrastructure for the Inner West Light Rail and the Leichhardt North light rail stop. As such, this change would be consistent with surrounding transport infrastructure land use and unlikely to significantly alter the amenity and character of the area.

8.3.2 Rozelle surface works

To assess socio-economic impacts at Lilyfield and Rozelle, the Rozelle surface works have been broken down into three areas:

- Rozelle Rail Yards
- The Crescent and Whites Creek
- Victoria Road and Anzac Bridge approaches.

Rozelle Rail Yards

This area is presently a redundant industrial and transport infrastructure site and inaccessible to the public. Site management works are currently underway under a separate planning approval to remove rail and rail-related infrastructure including vegetation, buildings and stockpiles from the site. Upon operation of the M4-M5 Link, this site would contain permanent transport infrastructure associated with the project including portals, motorway operations complexes, water treatment plant and ventilation facilities and outlets. As outlined in **Chapter 12** (Land use and property) of the EIS.

The project would, on operation, deliver 10 hectares of new open space at the Rozelle Rail Yards as well as new and enhanced active transport links and allow the site to be used by the community at large. As outlined in Chapter 12 (Land use and property) of the EIS, the proposed location of the motorway infrastructure has been developed to maximise the area of land that could be used for social infrastructure. Final design plans would be outlined in the UDLP.

The socio-economic benefits of providing additional green space at this location include:

- Improved active and passive recreational opportunities
- Direct health and safety benefits (such as protection for water supply and groundwater recharge areas, cleansing of air, separation from hazards)
- Economic development including enhanced local real estate values
- Improving the amenity and character of the area
- Promote healthy lifestyles by facilitating improvements in physical fitness through exercise, and also by facilitating positive emotional, intellectual, and social experiences
- Improve mental health and feelings of wellbeing, particularly lower stress levels
- Improve opportunities for social interactions and community cohesion.

Open space in areas may also present some hazards, such as attracting antisocial behaviours (particularly in isolated areas). However, these may be mitigated through crime prevention through environmental design (CPTED) principles.

The Crescent and Whites Creek

The operation of the project would result in the permanent loss of Buruwan Park (0.3 hectares). Buruwan Park would be occupied by permanent operational infrastructure (including the new alignment of The Crescent). The loss of Buruwan Park however would be more than offset by the delivery of the new open space within the Rozelle Rail Yards and new grade-separated pedestrian and cycle connections in the local area.

Victoria Road and Anzac Bridge approaches

The rehabilitated Victoria Road civil site (C7) and reconstruction of Victoria Road for an operational purpose would result in the permanent loss of a small number of commercial buildings located on the western side of Victoria Road. The potential for future redevelopment of this land for commercial uses, in accordance with the existing land zoning, would be lost.

The design of the approaches to and from Anzac Bridge includes the delivery of new and enhanced active transport connections, including the reservation of space below the bridge to provide a route between the Anzac Bridge and the Rozelle Rail Yards. This route would also allow future connections into the future redevelopment areas of the White Bay Power Station and the wider Bays Precinct Transformation Precinct. Increased active transport routes wound increase opportunities for community cohesion and may result indirect health benefits associated with increased pedestrian and cyclist activity.

8.3.3 Iron Cove Link

During construction of the project, a construction ancillary facility would be located at Iron Cove civil site (C8), which would result in a change of land uses from residential and commercial to transport infrastructure. This change is due to the acquisition of properties south of Victoria Road to facilitate road widening and the Iron Cove Link transport infrastructure.

As shown **in Appendix L** (Technical working paper: Urban design) of the EIS the siting of operational project infrastructure such as the ventilation facilities and tunnel portals and entry and exit ramps have been developed in consideration of maximising areas of land that would be available for future landscaping and/or provision of community and social infrastructure.

A portion of land immediately south of the eastern Iron Cove Bridge approach would be permanently occupied for transport infrastructure purposes (including carriageways and pedestrian and cycle paths) during operation. This land is currently part of King George Park. The remaining project land not required for operation would be rehabilitated and returned for use for public recreation purposes in accordance with the UDLP. Following the completion of construction, the connection between the Bay Run and Victoria Road and the Iron Cove Bridge would be reinstated in generally the same arrangement as existing.

Bioretention facility and car park improvement works

A bioretention facility to treat stormwater runoff and car park improvement works would be constructed within an existing informal parking area adjacent to Manning Street within King George Park at Rozelle on land zoned for public recreation uses.

The location of the bioretention facility, which would provide an environmental benefit, is unlikely to impede redevelopment of this land as it zoned RE1 Public Recreation under the Leichhardt Local Environmental Plan 2013, which limits the potential for development. The formalisation of the car park to around 34 spaces would improve the safety and efficiency of the car park and is in accordance with the King George Park Plan of Management.

8.3.4 St Peters interchange

As outlined in Chapter 12 (Land use and property), the St Peters interchange is being constructed and delivered by the New M5 project. As this area is currently being used for motorway construction, the ongoing use for the construction of the project is consistent with present land use.

The M4-M5 Link project would construct a motorway operations complex within the St Peters interchange, including a ventilation facility and outlets. The area immediately surrounding this complex would be landscaped in accordance with the UDLP. The remainder of the site would be

landscaped and converted to open space in accordance with the conditions of approval for the New M5 project.

Summary of impact

Although the operation of the project would result in altered land use and character of locations within the study area, the benefits of additional open space and increased pedestrian and cyclist links would provide substantial socio-economic benefits. Effects would be long-term and benefit the Greater Sydney Region. The change from existing baseline environment would be large. The consequence of change would be major and the likelihood of effects is near certain. The significance of impact on the socio-economic environment would be moderate positive.

8.4 Housing and demography

Increased housing supply and urban renewal locations are supported in areas with good access and connectivity and on the public transport network. As identified in **Appendix H** (Technical working paper: Traffic and transport) of the EIS, the project would decrease road capacity constraints among the existing road network, which may result in future development and urban renewal opportunities within the study area. *A Plan for Growing Sydney* identifies the Parramatta Road corridor as a focus for increased housing, economic activity and social infrastructure.

The WestConnex project, which includes the M4-M5 Link, would provide the opportunity to transform Parramatta Road due to the reduction in traffic volumes in certain sections and the delivery of an alternative route for heavy vehicles. The Parramatta Road Corridor Urban Transformation Strategy was approved in November 2016 and provides a 30-year vision to deliver 27,000 homes and 50,000 jobs. The Implementation Plan[55] identified that planning for the transformation of the Parramatta Road Corridor must be done in consideration of the staged delivery of WestConnex and respond to the changed conditions along the Corridor. The Implementation Plan would be updated annually to allow it to respond to any changes in the program of delivery for WestConnex and other key infrastructure projects.

Transport for NSW is committed to delivering an on-road rapid transit system to support the shared vision for the growth of the Parramatta Road Corridor. The Parramatta Road Corridor's on-road rapid transit route, from Burwood train station to the Sydney CBD, would service five of the eight Precincts along the Parramatta Road Corridor (Burwood-Concord, Kings Bay, Taverners Hill, Leichhardt and Camperdown). Public transport journeys are forecast to become faster and more reliable through the operation of higher frequency and capacity services, additional on-road transit priority and the provision of high-quality and accessible transit 'superstops'.

Overall, the potential change to existing housing and demographics is expected to be long term and affect the Inner West and City of Sydney LGA. The change from the existing baseline environment would be small. The consequence of change would be moderate and the likelihood high. As such, the overall significance of impact on the socio-economic environment would be moderate positive.

8.5 Community cohesion

As identified is **section 6.2.3**, community cohesion refers to the connections and relationships between individuals and their neighbourhoods. The inverse of this concept is community severance, which refers to physical or psychological barriers between communities. The operation of the project has the potential to create or alleviate both of these effects.

Improvements to the road network often plays a significant contribution to local and regional cohesion, and has a prominent role in the geographic distribution and equity of economic growth. Road infrastructure may act as a catalyst in fostering development by creating sustainable, autonomous growth zones.

During the operational phase, project elements that could affect community cohesion, both positively and negatively, including alterations to the regional road network, local road closures at Clubb Street

[55] UrbanGrowth NSW 2016, Parramatta Road Corridor Urban Transformation Plan 2016-2023

in Rozelle), the widening of Victoria Road and increases and decreases in the amount of traffic on connector roads.

The operation of the project would deliver new and enhanced active transport connections, which would have the potential to increase social connectivity and community cohesion within the within the study area.

Once construction is completed, parts of the Rozelle Rail Yards would be redeveloped as public open space. This would provide substantially improved community access and transport linkages through this area.

The concept design identifies that the Rozelle Rail Yards would be developed as open space, including a constructed wetland and pedestrian and cyclist infrastructure. Open space areas created at this location would be developed and implemented in accordance with the UDLP for the project. This additional open space area would provide the community in Rozelle with increased access to active and passive recreation facilities and would increase opportunities for community cohesion.

Community severance

Community severance may lead to short or long-term changes to people's behaviour patterns, affecting established community networks and an area's character and sense of place.

Community severance effects often occur during major transportation projects due to detours in the local road network, changes to active and public transport routes, and connector roads receiving an increase or decrease in traffic movements (creating a barrier effect).

The widened Victoria Road carriageway has the ability to exacerbate the barrier effect and separation between the communities of Rozelle and Balmain. This effect would be somewhat mitigated by the improvement of pedestrian and cyclist accessibility between Toelle and Terry streets. The location of the portals would also reduce this impact, allowing a direct link between these streets. A pedestrian crossing would be provided, connecting over the two northbound lanes before linking with another signalised crossing over the two southbound lanes of Victoria Road.

The closure of Clubb Street is unlikely to cause community severance, given that other through roads in the immediate surrounding area would remain open.

The Rozelle Rail Yards currently act as a significant physical barrier between the communities of Annandale, Rozelle and Lilyfield. On operation, Rozelle Rail Yards would be transformed into public open space with a network of active transport links, north-south and east-west. The works at the Rozelle Rail Yards include a pedestrian and cycle land bridge that would provide a north-south connection between Bicentennial Park, the Rozelle Rail Yards and beyond to Easton Park.

In addition, it is expected that 2,000 heavy vehicles would be removed from Parramatta Road and that traffic would be reduced on sections of major arterial roads in the area, including City West Link, Parramatta Road, Victoria Road, King Street, Princes Highway, Southern Cross Drive and Sydenham Road. This forecast traffic reduction may lead to increased activation of these streets for residents, visitors and businesses.

The operation of the project is expected to increase community cohesion and reduce existing community severance issues for a large number of local residents in the Inner West LGA. The effects would be long term and the change in baseline conditions would be medium. The overall consequence would be moderate and likelihood would be high. The overall significance of impact on the socio-economic environment would be moderate positive.

8.6 Economy

8.6.1 Freight and efficiency costs

The freight industry is an important part of the NSW economy as an enabler of economic activity. Numerous industries are dependent upon efficient transport to service operational requirements by moving goods and products around the State and further afield. Transport for NSW estimates that freight and logistics contributed $58 billion to NSW State Gross Product (SGP) in 2011, which represented 13.8 per cent of NSW SGP. A large proportion of goods are imported and exported to

and from Port Botany, in Sydney. In addition, in 2012 Sydney Airport handled 615,000 tonnes of air freight. Sydney Airport Corporation in 2014 estimated that it contributed around $30 billion annually to the NSW economy[56].

The freight industry is expected to double by 2031 to 794 million tonnes compared to 2011. Over 60% of total freight, in 2011 was moved by road in heavy vehicles, and this is likely to continue. Increasingly, road freight is subject to congestion and capacity constraints, particularly on the M4 and M5 motorways in peak periods. Congestion is also predicted to worsen around Sydney Airport and Port Botany.

Delays in vehicle movements directly affect businesses expenditure and productivity. The NSW Long Term Transport Master Plan estimates Sydney's congestion costs around $5 billion per year – equivalent to an annual cost of $1,100 per capita within Sydney. Without action, these costs are forecast to rise to $8.8 billion per year by 2020[57].

In response, the WestConnex Updated Strategic Business Case (2015) has estimated that there would be significant road network improvements arising from the construction and operation of WestConnex. These improvements would benefit both light commercial and freight road users by reducing travel times to and from Sydney Airport and Port Botany as well as from the west and south west. The business case estimates that travel times from the west to Sydney CBD would improve by 15 to 20 minutes.

One of the objectives of the M4-M5 Link project is to encourage heavy and commercial vehicles to utilise the proposed tunnels over surface roads. The NSW Freight and Ports Strategy[58] states that WestConnex would *'reduce freight costs through increased travel speeds and reliability and reduce the distances travelled by freight vehicles. WestConnex has the potential to deliver time savings on the M4/M5 corridors in the order of 15 minutes to 35 minutes by 2031'.* Importantly, WestConnex is expected to deliver the following benefits to freight vehicle users (in discounted terms), including:

- Reliability benefits valued at over $633 million
- Vehicle operating cost benefits valued at over $2.9 billion
- Travel time savings valued at over $5.9 billion[59].

For freight road users the project this would deliver important improvements to the existing situation for a large number of businesses within the region. Effects would be long term, and benefit the Greater Sydney Region. This would result in a large change in baseline conditions. The consequence of impact would be major and the likelihood would be near certain. The significance of impact on the socio-economic environment would be major positive.

8.6.2 Employment Connectivity

Over twenty-five per cent of all Sydney jobs are located in the Global Economic Corridor, which presently extends from Norwest in the North through to Sydney CBD and to Port Botany and Sydney Airport[60]. Western Sydney is expected to deliver strong job growth over the next twenty years, however employment in the eastern part of the city would also continue to see solid growth. This means that people from western Sydney would continue to travel eastwards on a daily basis for employment opportunities. WestConnex would provide improved transport connections to the Global Economic Corridor and the eastern part of the city, as well as facilitating the future growth of Parramatta, Sydney's second CBD. The WestConnex Updated Strategic Business Case (2015) estimated that motorists would save 40 minutes on a typical journey from Parramatta to Sydney

[56] Sydney Airport Corporation Ltd, 2014, Sydney Airport Master Plan 2033

[57] Transport for NSW 2012, Long Term Master Plan

[58] Transport for NSW, 2013, NSW Freight and Port Strategy,

[59] NSW Roads and Maritime, November 2015, WestConnex Updated Strategic Business Case

[60] Department of Planning and Environment, 2014, A Plan for Growing Sydney

Airport. In addition, the reduction of traffic on surface roads would improve the road network and allow for enhanced bus services.

For commuters, the operational project would lead to a more reliable road network, reducing commuting time and lowering vehicle operating costs. Effects would be long term, and benefit the Greater Sydney Region, particularly residents and businesses in Western Sydney. This would result in a large change in baseline conditions. The consequence of impact would be major and the likelihood would be near certain. The significance of impact on the socio-economic environment would be major positive.

8.6.3 Road tolling

The socio-economic effects associated with road tolling may include alterations to travel times, reduced or redirected emissions, reduced traffic accidents, vehicle operation cost savings[61]. These benefits include improved operability within the network where greater connectivity enables current and potential users to reach their destinations more efficiently. In 2015, KMPG prepared a report on the Economic contribution of Australia's tolled roads[62] for TransUrban. KPMG estimated that NSW's toll roads have directly contributed $14 billion in economic, social and environmental benefits over 10 years ($ value derived using a seven per cent discount rate).

The WestConnex Updated Strategic Business Case proposes a distance based toll that would be implemented on operation of each component of the project. Distance based tolling means that motorists would only pay tolls for the sections of the motorway they use. Tolls for the entire WestConnex motorway would be capped at a maximum amount of $7.95 (2015 dollars) for cars and light commercial vehicles. Cars and light commercial vehicles would pay one third of the toll applied to heavy vehicles. Tolls would escalate up to a maximum of four per cent or the consumer price index (CPI) per year (whichever is greater) until 2040. After that, CPI only would apply.

Toll avoidance

One impact of implementing road tolling is the potential to increase congestion on surrounding non-tolled roads due to toll avoidance.

The WestConnex Road Traffic Model (WRTM) uses current best practice methods for representing drivers' behaviour with respect to their willingness to pay tolls for road travel time savings for multiple toll roads and routes through the Sydney metropolitan network. The toll choice model was developed for the WestConnex project as an augmentation of standard traffic route modelling procedures that are normally used in planning and assessment of untolled roads. The 'toll choice' model addresses private vehicle and commercial (truck) traffic behaviour, representing the different willingness of these vehicle users to pay for travel time savings in the context of total journey costs including tolls, travel times and distances available on competing routes.

To assess the values that differing vehicle users place on travel time savings, a project specific survey was designed and conducted in Sydney in 2013 asking road users questions about their willingness to pay tolls. Independent specialist peer reviewers provided oversight throughout the design and analysis of the survey. The survey yielded a distribution of estimates of the value that Sydney drivers are willing to pay in terms of tolls to reduce their travel time. These values were benchmarked against values from other studies in Australia and internationally. The survey results are used within the WRTM's route choice algorithm to represent the influence of a toll.

Appendix H (Technical working paper: Traffic and transport) of the EIS has predicted no major shifts in daily forecast traffic onto alternative, parallel routes as a result of the project.

[61] Ernst and Young 2008,The economic contribution of Sydney's toll roads to NSW and Australia, Report prepared for Transurban Ltd

[62] KPMG 2015, Economic contribution of Australia's toll roads, Report prepared for Transurban Ltd

Equity

In reviewing the literature on the socio-economic impacts of road tolling, there has been little empirical research on equity impacts. That is, the potential for tolled roads to influence travel patterns, and subsequently social and demographic patterns, according to ability or willingness to pay. The majority of the academic focus has been on the economic impacts of road tolling only[63]. Studies undertaken in Europe with respect to social impacts have produced different findings with no common themes or patterns being discernible. The research does however indicate that equity impacts are area specific[64]. That is, impacts depend upon where people live, where they work and their economic situation. Higher income earners are more capable of absorbing the cost of tolls than lower income households, whereas lower income households are more likely to travel longer distances and avoid tolls due to affordability constraints[65].

ABS 2011 Census data on taxable personal incomes highlights that Sydney's west, including Bankstown, Blacktown, Parramatta, Fairfield and Liverpool, are in the bottom 20 per cent of Sydney's income receivers[66]. The community consultation identified concern that despite the introduction of the M4-M5 Link toll-road, a proportion of the Greater Sydney population may not be able to afford to benefit from the increased efficiency and travel times that the M4-M5 Link project could offer.

However, the M4-M5 Link would enhance the benefits of the broader WestConnex project, particularly for travel between western Sydney and the Sydney CBD. For example, a person driving a car in 2017 from Penrith to the Sydney CBD (prior to the introduction of tolls on the M4) currently has the option of travelling along the M4 Motorway, which ends at Concord, and then would need to travel on the congested surface road network to the Sydney CBD.

An alternative route using the M4 Motorway, WestLink M7, the Hills M2 Motorway, Lane Cove Tunnel and the Sydney Harbour Bridge or the Sydney Harbour Tunnel would cost around $22.00 in tolls (in $2017) and is a distance of around 55 kilometres. After opening in 2023, the M4-M5 Link project would provide a journey using the M4 Motorway straight through to Anzac Bridge, via the M4-M5 Link, for a toll capped at $8.60 (in $2017) and a distance of around 40 kilometres. This would provide time and cost savings for motorists and increased access to employment centres.

The Iron Cove Link component of the project would enable toll free travel between Iron Cove Bridge and Anzac Bridge. This would assist in alleviating congestion on Victoria Road.

Although road tolling would be a cost to individuals, the benefits of tolling to the broader economy is a greater socio-economic consequence. Effects would be long-term and benefit the Greater Sydney Region. The change from existing baseline environment would be large. The consequence of change would be major and the likelihood of effects is possible. The significance of impact on the socio-economic environment would be moderate positive.

[63] Conference of European Directors of Roads, May 2009, The socio-economic impacts of road pricing

[64] Conference of European Directors of Roads, May 2009, The socio-economic impacts of road pricing

[65] Mokonyama, M 2012, 'The social impact of introducing a tolling scheme on a pre-existing urban network', Association of European Transport and Contributors.

[66] Phillip O'Neill 2013, Spreading the Wealth, University of Western Sydney

9 Assessment of cumulative impacts

9.1 Nature of cumulative impact

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of a project when added to other existing, planned, and/or reasonably anticipated future projects. The cumulative effect of multiple projects may decrease or intensify the socio-economic benefits or negative impacts on a particular receiver. Cumulative socio-economic impacts associated with transport and infrastructure projects include:

- Extended periods of construction impacting local amenity, disruption to traffic and pedestrian networks
- Incremental loss or severance of open space
- Economic effects including changes to business operation and revenues
- Construction traffic from multiple projects placing additional pressure on road networks and parking capacity
- Consultation and construction fatigue for local communities due to the concurrent or sequential planning and construction nature of the project.

Construction fatigue relates to receivers that experience construction impacts from a variety of projects over an extended period of time with few or no breaks between construction periods. Construction fatigue may be brought on through traffic and access disruptions, increased noise and vibration, reduced air quality, reduced visual amenity, increases in social impacts or any combination of these factors.

Appendix I (Technical working paper: Air quality) of the EIS has evaluated risk on the basis of the type and scale of activity and potential for dust to be generated during construction activities, and the location of sensitive receptors in the vicinity of these works. Dust management measures have been identified to minimise dust impacts and health risks during construction. **Appendix K** (Technical working paper: Human health risk assessment) of the EIS has identified that these measures would need to be in place through the duration of all construction projects, to minimise impacts in the long-term.

Appendix J (Technical working paper: Noise and vibration) of the EIS has included an assessment of noise impacts that may occur where there are construction activities from a number of road or other infrastructure projects that would occur consecutively and result in exposure to construction noise impacts for a longer period of time.

The key areas where construction fatigue would be expected are Haberfield, Ashfield, Rozelle and St Peters. These locations are discussed in more detail below.

9.2 Other WestConnex projects

The assessment of cumulative impacts includes the following WestConnex projects that may overlap with the timing of the construction of the M4-M5 Link project (**Table 9-1**).

Table 9-1 Projects included in cumulative assessment

Project	Description
M4 Widening Opened to traffic	· Widening the existing M4 Motorway from Parramatta to Homebush
M4 East Under construction	· Extension of the M4 Motorway in tunnels between Homebush and Haberfield via Concord. Includes provision for a future connection to the M4-M5 Link at the Wattle Street interchange.

Project	Description
New M5 Under construction	· Duplicating the M5 East from King Georges Road in Beverly Hills with tunnels from Kingsgrove to a new interchange at St Peters. The St Peters interchange would allow for future connections to the proposed future Sydney Gateway · The New M5 tunnels include provision for a future connection to the proposed Southern Connector (part of the proposed F6 Extension) and the M4-M5 Link.

9.2.1 Cumulative construction effects

The following tables outline duration of construction of other projects alongside construction for the M4-M5 Link at Haberfield and St Peters.

Haberfield

Table 9-2 Cumulative construction activities at Haberfield Option A

Construction activity	2018				2019			
M4 East - Northcote Street tunnel site (C7)								
Tunnel drainage and pavement works	■	■						
Mechanical and electrical fitout works	■	■	■					
Tunnel completion works				■	■			
Site rehabilitation and landscaping					■			
M4 East - Eastern ventilation facility site (C8)								
Shaft and structural works and ventilation building works	■	■	■					
Water tanks and pump rooms			■	■				
Mechanical and electrical fitout works	■	■	■					
Landscaping			■					
M4 East – Wattle Street and Walker Avenue civil site (C9)								
Road work	■	■	■	■	■			
Dive structures and cut-and-cover	■	■						
Mechanical and electrical fitout works	■	■	■					
Site rehabilitation and landscaping	■	■						
M4-M5 Link - Wattle Street civil and tunnel site (C1a)								
Initial road works and traffic management							■	
Site establishment and utility works							■	■
Below ground site set up								
Tunnelling								
M4-M5 Link - Haberfield civil and tunnel site (C2a)								
Initial road works and traffic management							■	
Site establishment and utility works							■	■
Below ground site set up								■
Establish temporary ventilation systems for Wattle Street and mainline								■
Tunnelling								
M4-M5 Link - Northcote Street civil site (C3a)								
Site establishment and utility works								■
Construct car park								■
Construct laydown area								■
Operation of car park and laydown area								

Table 9-3 Cumulative construction activities at Haberfield Option B

Construction activity	2018				2019			
M4 East - Northcote Street tunnel site (C7)								
Tunnel drainage and pavement works	■	■						
Mechanical and electrical fitout works	■	■	■					
Tunnel completion works				■	■			
Site rehabilitation and landscaping					■			
M4 East - Eastern ventilation facility site (C8)								
Shaft and structural works and ventilation building works	■	■	■					
Water tanks and pump rooms			■	■				
Mechanical and electrical fitout works	■	■	■					
Landscaping			■					
M4 East – Wattle Street and Walker Avenue civil site (C9)								
Road work	■	■	■	■	■			
Dive structures and cut-and-cover	■	■						
Mechanical and electrical fitout works	■	■	■					
Site rehabilitation and landscaping	■	■						
M4-M5 Link - Parramatta Road West civil and tunnel site (C1b)								
Site establishment and utility works				■	■	■		
Construction of temporary access tunnel						■	■	
Tunnelling								■
M4-M5 Link - Haberfield civil site (C2b)								
Initial road works and traffic management							■	
Site establishment and utility works							■	■
M4-M5 Link - Parramatta Road East civil site (C3b)								
Site establishment and utility works				■	■	■		
Use of car park and site amenities during construction						■	■	■

The local streets around the Haberfield construction ancillary facility that are most likely to be affected by consecutive construction activities include:

- Parramatta Road
- Wattle Street
- Walker Avenue
- Ramsay Street
- Bland Street
- Wolseley Street
- Northcote Street.

St Peters

Table 9-4 Cumulative construction activities at St Peters interchange

Construction activity	2018				2019			
New M5 – Canal road construction compound (C8)								
Cut and cover construction	■							
Tunnelling (including dive and excavation)	■	■	■	■	■	■		
Construction of the St Peters motorway operations complex (MOC4)	■	■	■	■	■			
Mechanical and electrical installation	■	■	■	■	■	■	■	■
Demobilisation and rehabilitation						■	■	■
New M5 – Campbell Road construction compound (C9)								
Demolition works	■	■		■	■			
Construction of the St Peters interchange	■	■	■	■	■	■	■	
Construction of local road upgrades	■	■	■	■	■	■	■	
Demobilisation and rehabilitation				■	■	■	■	■
New M5 – Landfill close construction compound (C10)								
Demobilisation and landscaping							■	■
New M5 – Burrows Road construction compound (C11)								
Construction of the St Peters interchange	■	■	■	■	■	■	■	
Construction of the Burrows Road motorway operations complex (MOC5)	■	■	■	■	■			
Demobilisation and rehabilitation							■	■
New M5 – Campbell Road bridge construction compound (C12)								
Bridge construction	■	■	■	■				
Construction of local road upgrades		■	■	■	■	■	■	
Demobilisation and rehabilitation							■	■
New M5 – Gardeners Road Bridge construction compound (C13)								
Bridge works	■	■	■	■	■	■		
Construction of local road upgrades	■	■	■	■	■	■	■	
Demobilisation and rehabilitation			■	■	■	■	■	■
New M5 – Sydney Park construction compound (C14)								
Site establishment		■						
Construction of shared path and bridge		■	■	■	■			
Demobilisation and rehabilitation					■			
M4-M5 Link – Campbell Road civil and tunnel site (C10)								
Initial road works and traffic management				■				
Site establishment and utility works				■	■	■		
Tunnelling						■	■	■

The local streets around the St Peter's interchange area that are most likely to be affected by consecutive construction activities include

- Campbell Street
- Albert Street.

The streets that are identified above in close proximity to the Haberfield and St Peters construction compounds and civil works, would be subject to construction impacts, over a number of years from both M4 East the M4-M5 Link. These projects, where they overlap, may lead to cumulative impacts relating to increased noise, reduced air quality, congestion on roads surrounding the construction activities, loss of on street car parking, and access disruption to both residences and businesses. There may also be a reduction in visual amenity due to the long term presence of noise barriers and hoardings, in conjunction with ongoing views of heavy plant and construction vehicles.

As outlined in **Appendix K** (Technical working paper: Human health risk assessment) of the EIS, the presence of impacts from multiple sources increases the potential for stress and anxiety. Such an

impact would be expected to result in a minor to moderate negative significance of impact on the socio-economic environment.

In addition to directly overlapping cumulative effects it is important to consider temporally consecutive impacts leading to construction fatigue. This relates to receivers that experience construction impacts from a variety of projects over an extended period with few or no breaks in between. Construction fatigue can be brought on through traffic and access disruptions, increased noise and vibration, and reductions in air quality or visual amenity. This may result in health impacts such as increased stress and anxiety due to uncertainty around timing and ongoing use of the sites. It can also cause financial hardship to businesses and industries as concentrated and ongoing construction effects reduce the efficiency of servicing and deliveries and/or the productivity of employees.

Conversely, businesses and the broader industry would benefit from consecutive construction activities with increased employment opportunities, potentially increased passing trade from construction workers and enhanced demand for construction related industries.

9.3 Major Roads and Maritime and other transport projects

The assessment of cumulative impacts includes the following major transport projects that overlap with the timing of the construction of the M4-M5 Link project at the Rozelle Rail Yards.

In particular, various sections of the Rozelle Rail Yards are likely to be used for an extended period as construction and management sites for the M4-M5 Link (Rozelle interchange), the CBD and South East Light Rail and the proposed future Western Harbour Tunnel and Beaches Link, as shown in **Table 9-5**.

Table 9-5 Rozelle Rail Yards

Construction activity	Indicative construction timeframe											
	2018				2019				2020			
CBD and South East Light Rail Rozelle maintenance depot												
Main construction works												
Proposed future Western Harbour Tunnel Beaches Link*												
Construction activity												
Rozelle civil and tunnel site (C5) indicative construction program												
Site establishment and utility works												
Traffic diversions and intersection works												
Construction of cut-and-cover and tunnel portals												
Tunnelling												
Construction of motorway operational ancillary infrastructure												
Civil and mechanical fitout												
The Crescent civil site (C6) indicative construction program												
Site establishment and utility works												
Surface road and intersection works												
Whites Creek widening and improvement works												
Drainage works including construction of the culvert below City West Link and upgrades to the drainage outfall to Rozelle Bay												
Construction of Whites Creek Bridge and demolition of existing bridge												
Victoria Road civil site (C7) indicative construction program												
Site establishment and utility works												
Support for the reconstruction of Victoria Road including construction of the new bridge												

Note: There is no overlap with Rozelle Rail Yards site management works

*No further detail available for proposed future Western Harbour Tunnel and Beaches Link construction

The local streets around the Rozelle construction ancillary facilities that are most likely to be affected by consecutive construction activities include:

- Lilyfield Road
- Bayview Crescent
- Hornsey Street.

The cumulative impacts would be comparable to those outlined in **section 7.2.2.** Additional negative impacts at this location would include disruption to active transport links and access to the Rozelle Bay light rail stop. Similar mitigation measures would be implemented.

9.4 Other projects

9.4.1 Parramatta Road Corridor Urban Transformation Program

This program is discussed in **section 4.3.7**. As the redevelopment of Parramatta Road is likely to occur over 30-year time frame the cumulative construction impacts of the project are considered minimal. In addition, the location, form and timing of development cannot be known with any certainty, so it is not possible to assess the potential cumulative impacts with any certainty.

9.4.2 The Bays Precinct Transformation Plan

The Bays Precinct is discussed in **section 4.3.8.** Planning for the precinct still in early stages and as such it is not possible to accurately assess the cumulative construction impacts may arise. It is clear however, the area would be subject to extended periods of construction disruption, which may lead to increased traffic around Victoria Road, the Rozelle interchange, City West Link and Anzac Bridge. This would include traffic, visual amenity, noise and air quality impacts in particular.

9.5 Cumulative operational impacts

Once operational, the M4-M5 Link, alongside the other major transport projects, is predicted to deliver beneficial cumulative impacts for the community.

These include:

- Supporting Sydney's long-term economic growth, through improved transport connectivity to western Sydney and key employment areas across the city. Of particular importance is the contribution of the project to the efficiencies of the freight industry
- Improved community connectivity on local roads through transferring traffic and heavy vehicles from surface roads, to underground. The project would deliver new and improved active transport routes particularly around Rozelle Rail Yards and would enable the enhancement of public transport along Parramatta Road and Victoria Road
- The project is expected to alleviate congestion and contribute to improved connectivity, speeds, reliability and safety of the broader road network
- Reduced traffic on local roads may lead to opportunities for urban renewal particularly along parts of Parramatta Road.

10 Management measures

10.1 Environmental management measures

Environmental management measures during construction and operation relevant to socio-economic impacts are outlined in **Table 10-1**.

Table 10-1 Environmental management measures – social and economic

Impact	No.	Environmental management measure	Timing
Construction			
Impacts on businesses	SE1	A Business Management Plan will be prepared and will include: · Identification of businesses that have the potential to be adversely affected by construction activities that will occur as part of the project · Management measures that will be implemented to maintain appropriate vehicular and pedestrian access during business hours and visibility of the business to potential customers during construction, including alternative arrangements for times when access and visibility cannot be maintained. These will be determined in consultation with the owners of the identified businesses.	Construction
Changes to community access and connectivity	SE2	A Community Communication Strategy will be prepared that details: · Procedures and mechanisms that will be implemented by the in response to the key social impacts identified for the project · Property acquisition support services that will be provided · Procedures and mechanisms to communicate to project stakeholders (including affected communities), the access and connectivity enhancements and new community and social facilities that will be delivered as part of the project through the Social Infrastructure Plan and to update stakeholders on delivery progress · Procedures and mechanisms that will be used to engage with affected business owners to identify potential access, parking, business visibility and other impacts to develop measures to address potential impacts on a case by case basis.	Construction
Property acquisition	SE3	Property acquisition will continue to be undertaken in accordance with the Land Acquisition Information Guide (Roads and Maritime 2014), the *Land Acquisition (Just Terms Compensation) Act 1991 (*NSW) and the land acquisition reforms announced by the NSW Government in 2016 (NSW Government, 2016). A property acquisition factsheet that outlines the process and provides further information for concerned residents will continue to be made available online and in hard copy at project information centres.	Construction
	SE4	Affected households will continue to have access to a counselling service that assists people through the property acquisition process.	Construction
	SE5	An independent service will continue to be provided to vulnerable households (eg elderly, those suffering an illness)	Construction

Impact	No.	Environmental management measure	Timing
		to assist with relocation. Assistance could include finding a suitable house for relocation, arranging removalists, disconnecting services and attending appointments with solicitors or other representatives.	
	SE6	A community relations support toll-free telephone line will be operated to respond to any community concerns or requests for translation services.	Construction
Operation			
Impacts on social infrastructure and facilities	OSE7	A Social Infrastructure Plan will be prepared that details: · Measures that will be delivered as part of the project to improve community connectivity in areas affected by the project, including pedestrian and cyclist access · Community and social facilities, for example open space, that will be delivered or enhanced as part of the project · Community initiatives and programs that will receive support as part of the project, including the manner in which support will be provided. · The Social Infrastructure Plan will be prepared by a suitably qualified and experienced person in consultation with the community and relevant councils and implemented as part of the project.	Construction and operation

10.2 Management of cumulative impacts

There are actions that will be put in place to manage the cumulative impacts associated with construction fatigue. **Appendix K** (Technical working paper: Human health risk assessment) of the EIS outlines the following measures:

- An Acoustic advisor will be appointed as an independent technical specialist whose role will be to review data collected and provide advice and recommendations to ensure noise and vibration impacts are avoided or minimised within the community. This may involve changes in work practices or the implementation of additional noise management/mitigation measures. This role will be undertaken for the duration of construction
- The Utilities Coordination Group, formed of representatives from concurrent projects and asset providers, will review the concurrent activities to manage and minimise impacts on utilities (relocation, adjustment or protection), where possible
- A Complaints Management System will be in place for the duration of construction. This system will include the recording of complaints and how the complaint was addressed (within a Complaints Register). A Community Complaints Commissioner, who is an independent specialist, would oversee the system and would follow-up on any complaint where the public is not satisfied with the response.

In addition, the CEMP would address, manage and reduce impacts on surrounding properties as much as possible.

Ongoing communication with residents, businesses and landowners will be equally as important. The Business Management Plan and the Community Communication Strategy will include information on how households and businesses (the most affected by cumulative impacts) will be kept updated. Keeping people informed will help alleviate uncertainty around the timing and activities within project construction sites and in turn reduce annoyance, stress and anxiety. Mitigation measures in this respect are detailed in **Table 10-2**. It will also be important for all agencies involved in these projects to collaborate and coordinate works to minimise disruption and the cumulative impacts. This will assist in consistent messaging to the community. For example, it will be important to ensure that the Rozelle interchange is properly integrated into the future plans for The Bays Precinct and that consultation between the relevant agencies continue.

Table 10-2 Management measures for cumulative effects

Management measure	Description
Community communication	The Community Communication Strategy should identify those households and the Business Management Plan, should identify those businesses and landowners that are the most affected by the cumulative impacts of construction and subject to construction fatigue. Measures should be included which seek to keep people well informed of the construction program and how they are likely to be affected. The Community Communication Strategy and the Business Management Plan will be prepared prior to the commencement of construction and implemented for the duration of construction.
Agency and stakeholder communication	The very nature of these projects involve a multitude of agencies and stakeholders. In order to minimise the cumulative impacts on the community from these projects, it will be important for the various agencies and stakeholders to collaborate and coordinate as much as practicable. Consideration will be given to the creation of a project working group, or equivalent to guide key stages of the several projects with the aim of managing impacts and disruptions and importantly keeping the community informed. Communication strategies across the various projects should be managed to be consistent in their messaging to the community to avoid confusion and annoyance.

11 Conclusion

Overall, this specialist assessment has found that the project would result in a range of positive and negative social and economic impacts on residents, businesses and social infrastructure. The impacts would vary in their distribution across the study area during the construction and operational stages of the project.

Whilst the construction of the project is likely to stimulate broader economic benefits by way of job generation and construction multipliers, at a more local level, residential, social infrastructure users, businesses and landowners would experience a degree of disruption and other temporary negative impacts. This would be particularly felt by people located within close proximity to the proposed construction compounds, within close proximity to the tunnel alignment and areas where utility works would occur. These impacts would need to be carefully and proactively managed with any mitigation measures monitored for their effectiveness and outcomes.

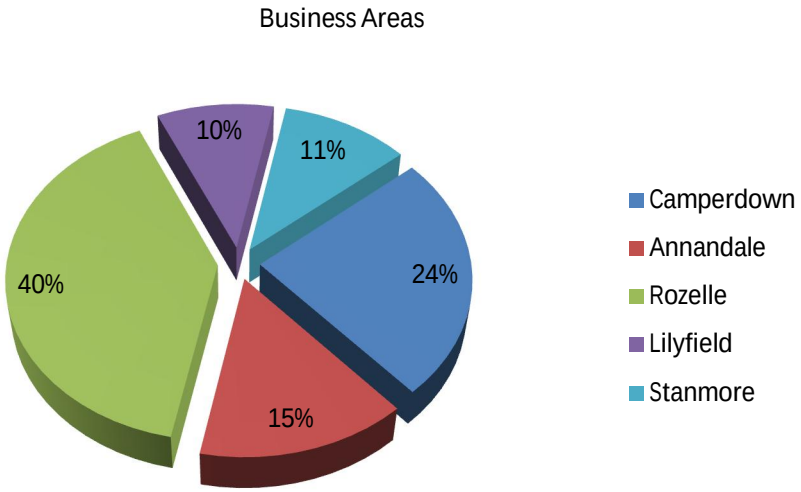
Upon operation, the project is likely to result in an overall major positive impact to the study area and broader region. This would result from an enhanced network capacity and connectivity between the inner city, inner west, south, south-western and western Sydney. The project would particularly support freight and commercial vehicle movements between the major economic regions of Sydney. At a local level, the new transport infrastructure would result in both positive and negative impacts for communities and businesses. Some communities would benefit from significant improvements in increased travel speeds, improvements to active transport network and from the delivery of new and enhanced open space areas. Other receivers may experience a slight reduction in the amenity due to alterations in views of new transport infrastructure and ancillary facilities, increased vehicles in the locality or the introduction of ventilation stacks to the environment, for example.

In summary, the implementation of appropriate mitigation measures by the proponent and a commitment to ongoing community engagement, monitoring and management would create a project that positively supports the economic growth of Sydney and broader NSW. This project would complement a range of federal, state and local objectives and strategies including those in *A Plan for Growth Sydney* (2014) and the *NSW Long Term Transport Master Plan* (2014). It would also support the opportunity for urban revitalisation and land use changes including the implementation of the Parramatta Urban Transformation Strategy and The Bays Precinct Transformation Plan.

Appendix A Business survey

In order to identify the impacts associated with businesses in the study area, a snapshot survey of 106 businesses located in the study area was undertaken. The methodology for undertaking the business surveys can be found in **section 3.4** of the main document. This annexure provides an overview of the core themes and responses to the business survey. The implications of the findings and how they relate to the project have been discussed in **Chapters 7**, **8** and **9**.

From the businesses that were surveyed, 40 per cent were located in Rozelle, 24 per cent were located in Camperdown, 15 per cent in Annandale, 11 per cent in Stanmore and 10 per cent in Lilyfield.

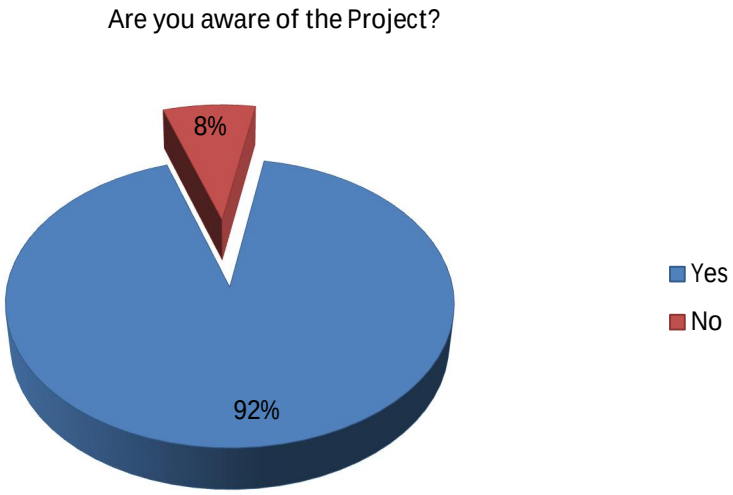


Business survey results

Questions regarding knowledge and perception of the project

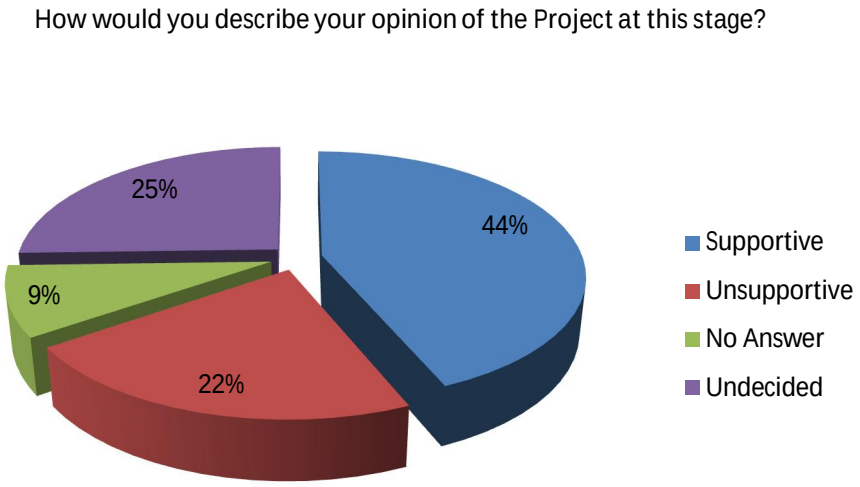
Q1. Are you aware of the project?

Of the businesses that responded, 92 per cent were aware of the project and only eight per cent had not heard of the project.



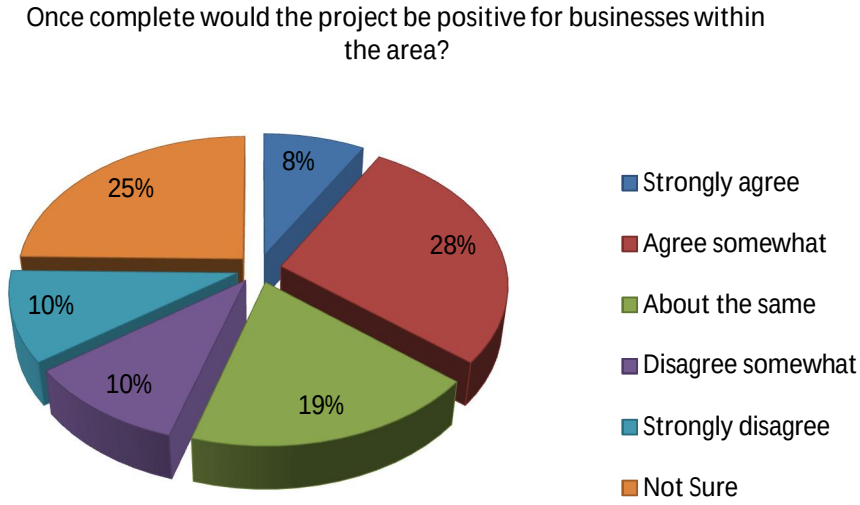
Q2. How would you describe your opinion of the project at this stage?

This question was open-ended when the survey was conducted. The following graph is a representation of the overall theme of the conversations conducted with business owners. Forty four per cent of the business owners surveyed were supportive of the project, 22 per cent were unsupportive, 25 per cent were undecided and nine per cent had no answer for the question.



Q3. Once complete would the project be positive for business within the area?

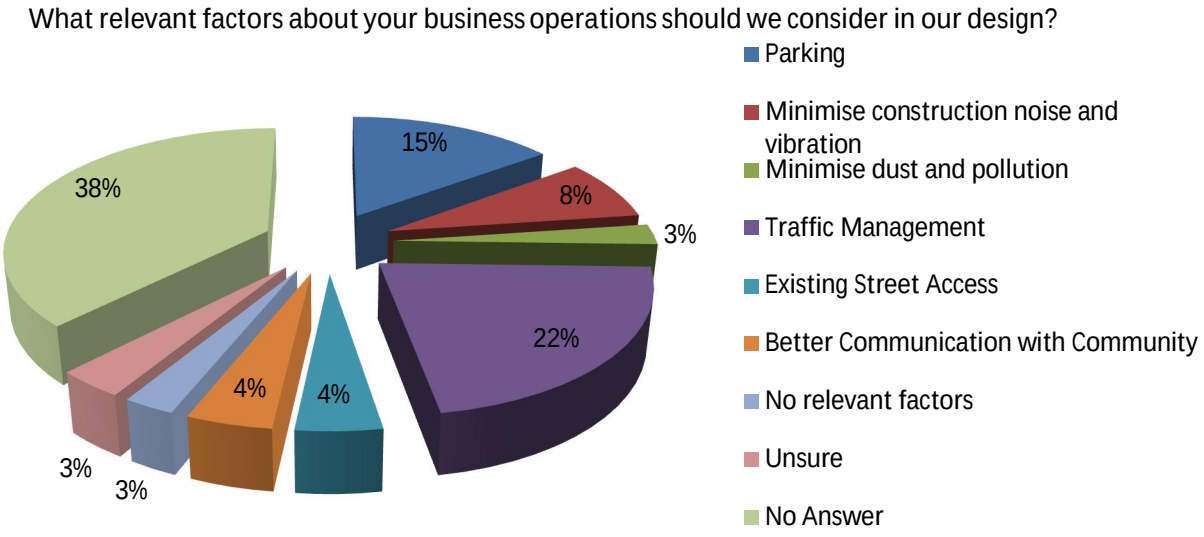
Of the businesses surveyed, 28 per cent agreed somewhat that the project would be positive for businesses in the area, with eight per cent strongly agreeing. Ten per cent disagreed somewhat and 10 per cent strongly disagreed. Nineteen per cent believed that business activity would be about the same and 25 per cent of business owners were unsure of the affects that the project would bring to local business.



Q4. What relevant factors about your business should we consider in our design?

Of the 106 businesses surveyed, the most common recurring theme that should be considered in the project design was traffic management. Twenty two per cent of the persons surveyed indicated that if any bottlenecking of traffic near the entry/exit points of the tunnel were to occur, it would be problematic for their business. In addition, construction vehicles that are removing spoil should operate outside of peak hour traffic to minimise any further congestion on the main roads. Fifteen per

cent of the persons surveyed, expressed concerns about the already limited parking and the effects that the construction workers would have by using customers' parking spots during their operational hours. Thirty-eight per cent of the respondents had no answer for the question.



Questions regarding impacts on businesses during construction

Q5. During the construction phase, what possible impacts (positive/negative) do you think this project could bring to your business?

From the 106 businesses surveyed, 44 per cent indicated that the construction would have a neutral/no effect on their business operations. Twenty-two per cent stated that they would be somewhat negatively impacted, with 10 per cent suggesting it would be significantly negative. Fifteen per cent said the construction would be positive for their business and one per cent said it would be significantly positive. Nine per cent of the business owners were unsure of the implications from construction.

Forty-six per cent of businesses stated that construction would have no effect on customer access, 29 per cent said it would be negative and 13 per cent said it would be significantly negative. Four per cent mentioned construction would be positive and one per cent said it would be significantly positive. Eight per cent of the respondents were unsure of the impacts on customer access.

The respondents had concerns about customer parking with 22 per cent suggesting construction would result in negative impacts and 17 per cent suggesting it would be significantly negative. Fifty-five per cent implied it would have neutral or no effect and five per cent were unsure. One per cent of businesses thought it would have a positive effect on customer parking.

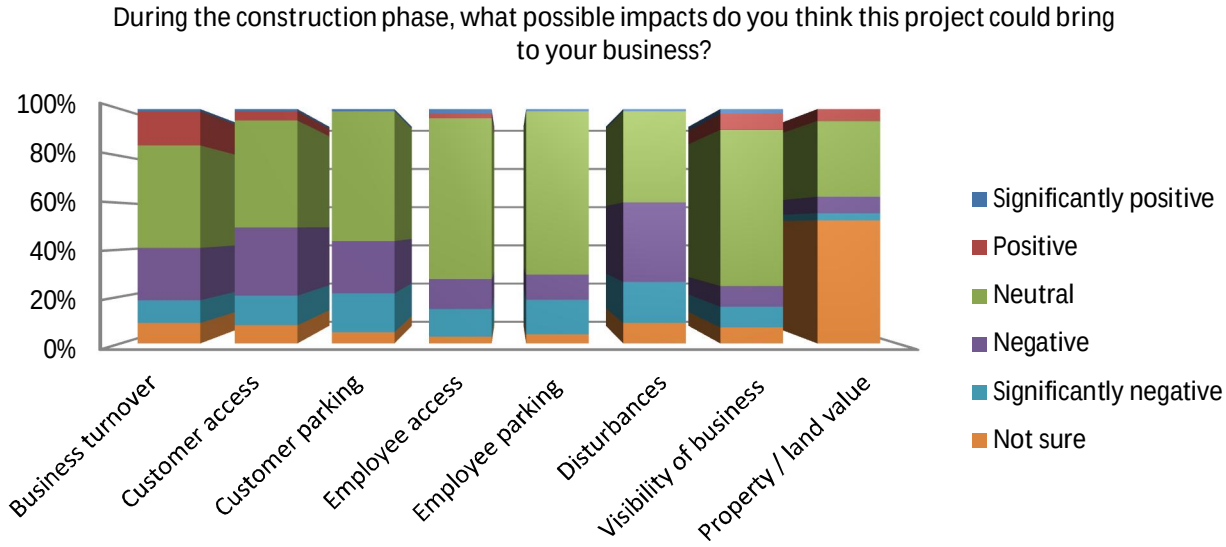
Employee access was seen as being relatively unaffected with 69 per cent stating there would be no impacts, although 13 per cent said it would be somewhat negative and 12 per cent stated it would be significantly negative. Three per cent were unsure but two per cent of the respondents said it would be positive and two per cent said it would be significantly positive.

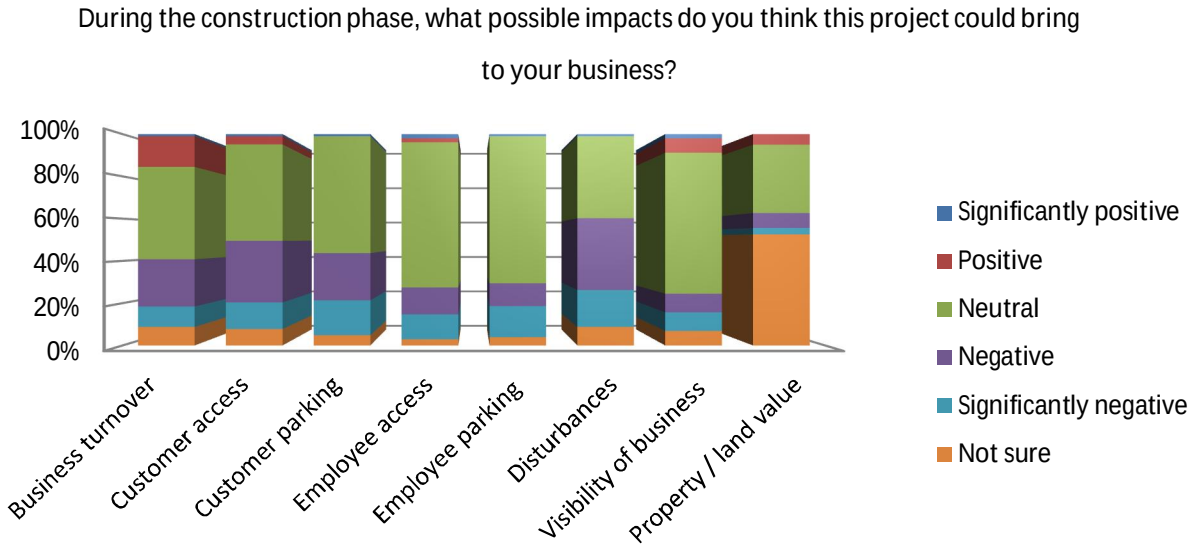
Seventy per cent said their employee parking would remain neutral, with only one per cent stating it would be significantly positive. Eleven per cent stated construction would be negative for employee parking, 15 per cent said it would be significantly negative and four per cent remain unsure of the effects.

Thirty four per cent perceived that the disturbances related to construction would cause negative impacts on their business, 17 per cent mentioned it would be significantly negative. Thirty nine per cent said they would remain unaffected. One per cent responded by saying it would be significantly positive but no owners said the disturbances would be positive. Nine per cent were not sure of the impacts.

Sixty-seven per cent of the respondents stated their business visibility would be unaffected by construction, seven per cent said the impacts would be positive and two per cent said it would be significantly positive. Nine per cent mentioned the impacts would be negative and nine per cent said it would be significantly negative. Seven per cent were unsure of the impacts brought on by construction.

The majority of the respondents (53 per cent) were unsure of the impacts on property/land values brought on by construction, three per cent said it would be significant negative and seven per cent stated it would be negative for the land values. Five per cent said it would be positive although no business thought it would be significantly positive.

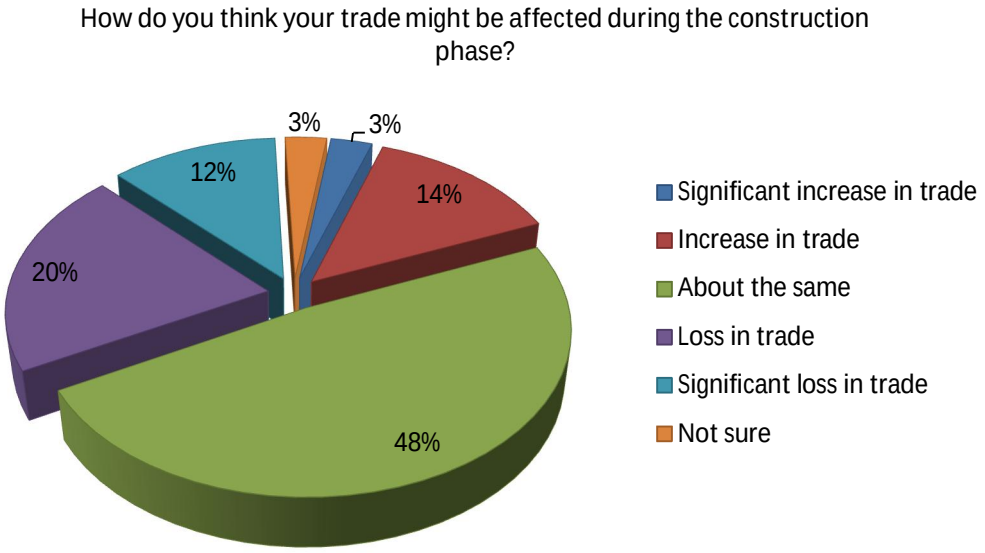




Q6. How do you think your trade might be affected during the construction phase?

Of the respondents that answered the question, the largest response at 49 per cent, stated that their trade during the construction phase would be about the same, 20 per cent of the respondents believed that they would have a loss in trade and 12 per cent believed that they would have a significant loss in trade. Seventeen per cent predicted construction would be positive for business with 14 per cent stating they believed they would have an increase in trade and three per cent would have a significant increase.

Of the 17 per cent that stated construction would have a positive impact on their trade, over 70 per cent were food and beverage business types and 10 per cent was retail.



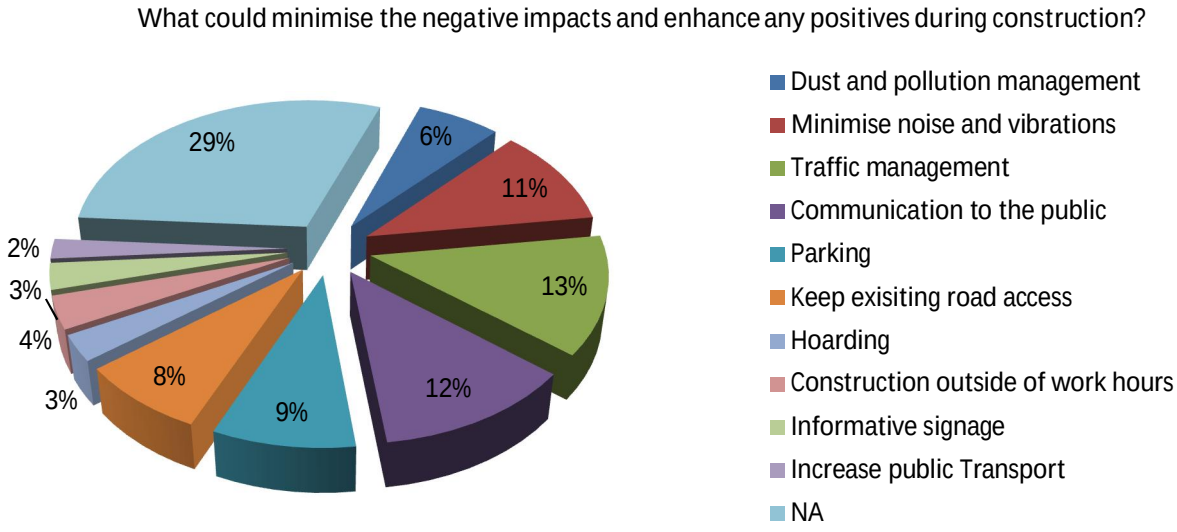
Q9. What could minimise the negative impacts and enhance any positives during construction?

Dust and pollution management was raised as a concern by respondents in relation to dust created during construction and the removal of spoil from sites. The pollution concerns relate to exhaust fumes created by the machinery used in construction. Six per cent of the respondents expressed that careful evaluation and management of these impacts would minimise negative impacts on their business.

Minimising noise and vibrations was identified by 11 per cent of the respondents with 13 per cent stating traffic management was vital to their business survival. Another similar factor was raised by eight per cent, who wanted to keep their current road access to their location and nine per cent were worried about parking access and availability once construction started. The majority of these concerns are about the construction workers using customer parking.

Transparency and communication from the project managers during construction was a recurring theme mentioned by the businesses with 12 per cent stating that awareness would help prevent negative impacts. In addition, construction work being done outside of work hours was favoured by four per cent of respondents. This includes the spoil being removed outside of peak hour traffic to reduce any further congestion.

Other methods to reduce negative impacts and enhance positives include hoardings which was suggested by three per cent of the respondents surveyed and informative signage mentioned by three per cent.



Questions regarding impacts during operation

Q7. During operation phase, what possible impacts do you think this project could bring to your business?

Of the businesses that responded, 28 per cent stated that turnover would be positive during operation, 49 per cent stated that there would be no effect, seven per cent stated that there would be negative impacts, four per cent mentioned significantly negative impacts and 13 per cent were unsure how their business would be affected.

Twenty nine per cent of businesses had the perception that customer access, once the project was in operation, was positive and two per cent mentioned it would be significantly positive. Neutral impact of no effect is perceived by 46 per cent and negative impacts were stated by seven per cent of businesses with three per cent being recorded for significantly negative. Fourteen per cent were not sure what impacts would occur to businesses in the local area following operation.

The availability of customer parking was said to improve once the project was in operation by 15 per cent of respondents, whereas 18 per cent stated that parking availability would be worse. Fifty-six per cent of respondents stated that customer parking availability would be no different to current levels and 12 per cent of respondents were unsure.

Employee access was seen as positive 15 per cent of the business survey, 68 per cent mentioned the project would be neutral, seven per cent stated that they would experience negative impacts from operations and 11 per cent mentioned they were unsure of the impacts of the project once operational.

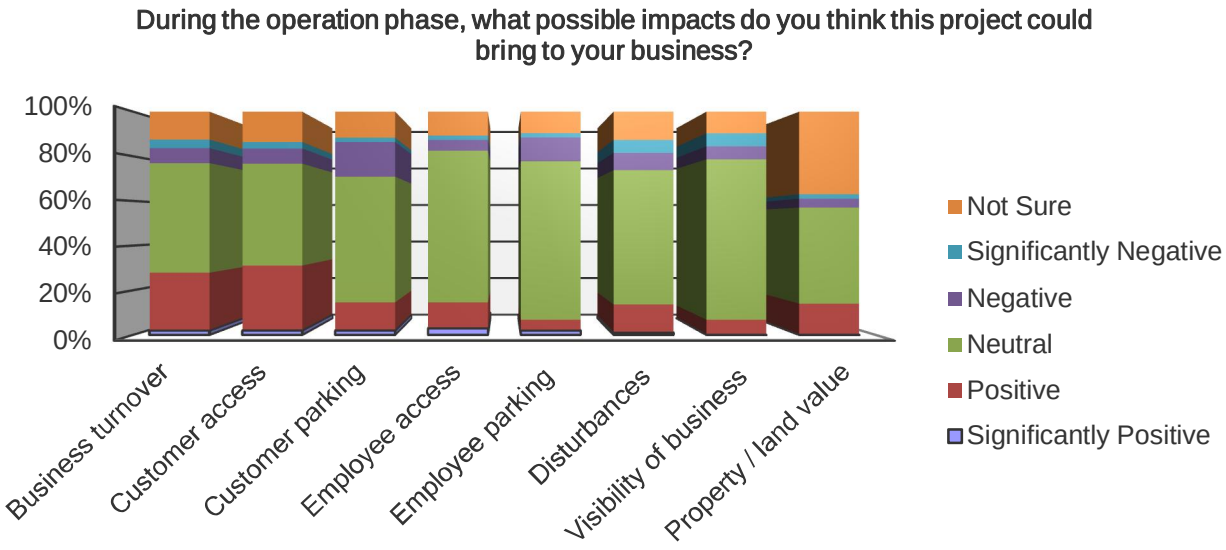
Seventy one per cent of the businesses mentioned that employee parking would experience neutral or no effect from the project once operational, five per cent said it would be positive and two per cent stated it would be significantly positive. Eleven per cent mentioned they would have negative impacts and two per cent stated it would be significantly negative. Ten per cent were unsure of the impacts cause by the completed project.

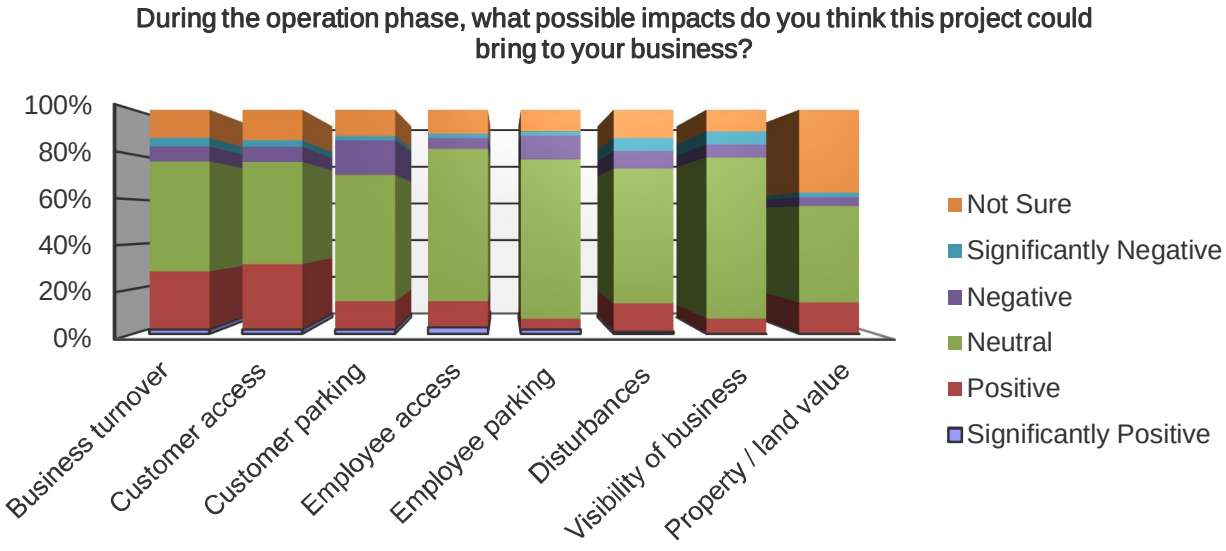
Disturbance was seen as having neutral effects by 60 per cent of the business owners, 13 per cent had the perception that they would have positive impacts and one per cent stated they would experience significantly positive impacts from having less cars on the road. Negative impacts were perceived by 14 per cent of respondents and 13 per cent were unsure of what impacts the project would have on their business.

Seventy two per cent of business owners had the perception that the visibility of their business would not be affected post construction, with seven per cent believing it would have positive impacts. A

combination of 12 per cent assumed that negative impacts would be the result of the project in operation and 10 per cent were not sure of the impacts.

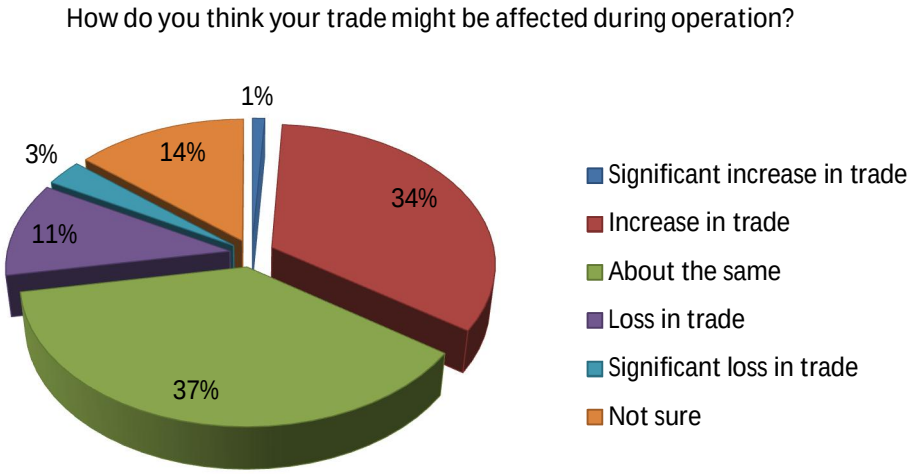
A completed project was believed to have neutral effects on property/land values by 43 per cent of the businesses with 37 per cent mentioning they were unsure of the impacts that the project would cause. Fourteen per cent saw it as being positive and four per cent saw it as negative with two per cent stating the completed project would be significantly negative.





Q8. How do you think your trade might be affected during operation?

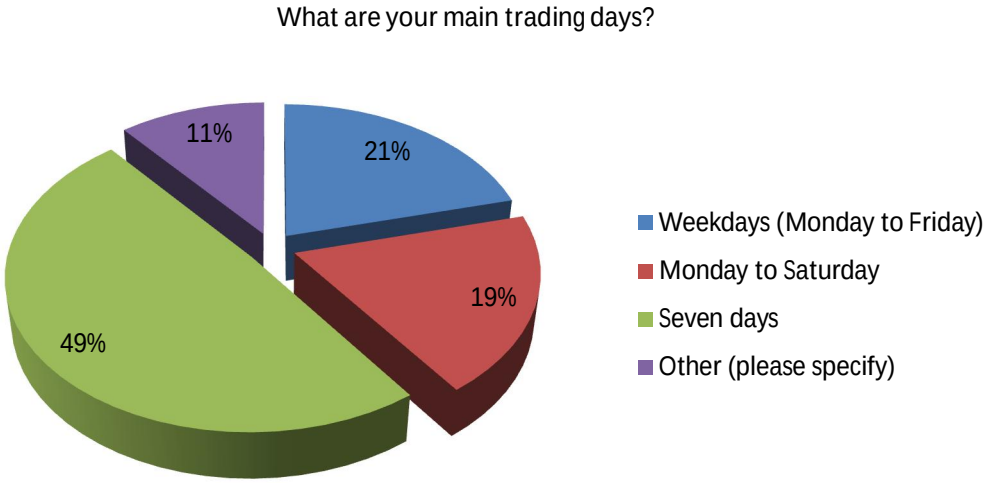
Of the businesses that responded to the question, 37 per cent perceived their trade would not be effected by the project in operation, 34 per cent believed they would have an increase in trade and one per cent thought they would have a significant increase in trade. A perception of loss in trade was mentioned by 11 per cent of respondents and three per cent stated their concerns for a significant loss in trade. Fourteen per cent were unsure of the ways the project, once operational, would affect their trade.



Questions regarding business information

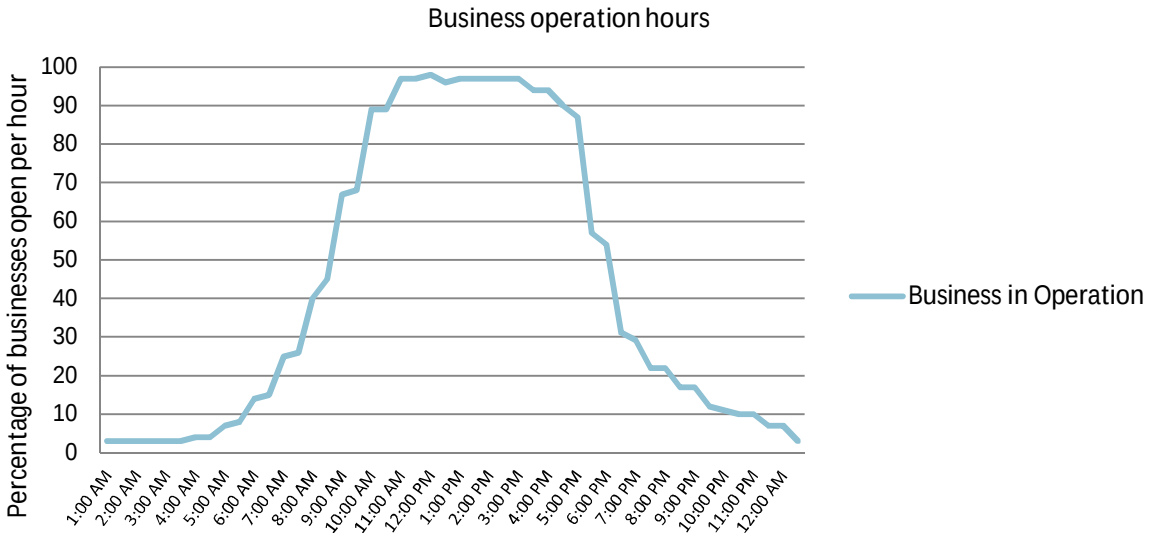
Q10. What are your main trading days?

Of the businesses surveyed, nearly half (49 per cent) the respondents suggested that their business was open every day, 21 per cent are open Monday to Friday, 19 per cent are open Monday to Saturday and 11 per cent are open on other day combinations.



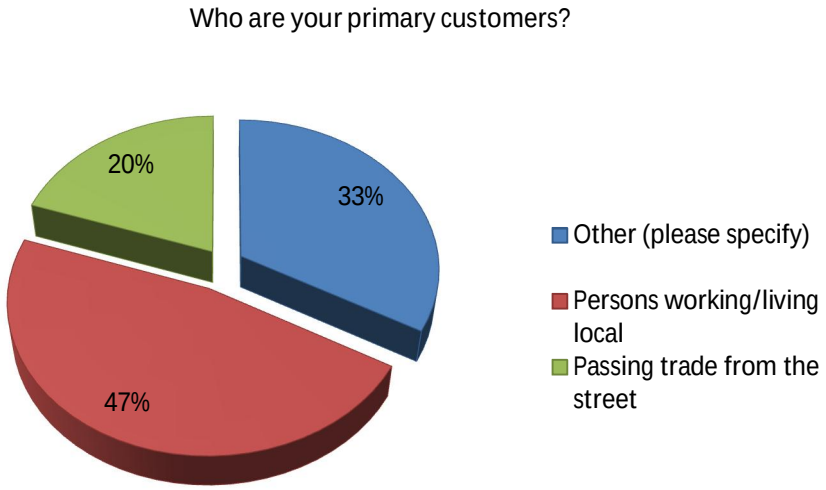
Q11. What are your general trading or opening hours?

The data from the respondents indicates that 69 per cent are operational between the hours of 10.00 am and 5.00 pm, 17 per cent operate between 1.00 am and 9.30 am and 15 per cent operate between 5.30 pm and midnight.



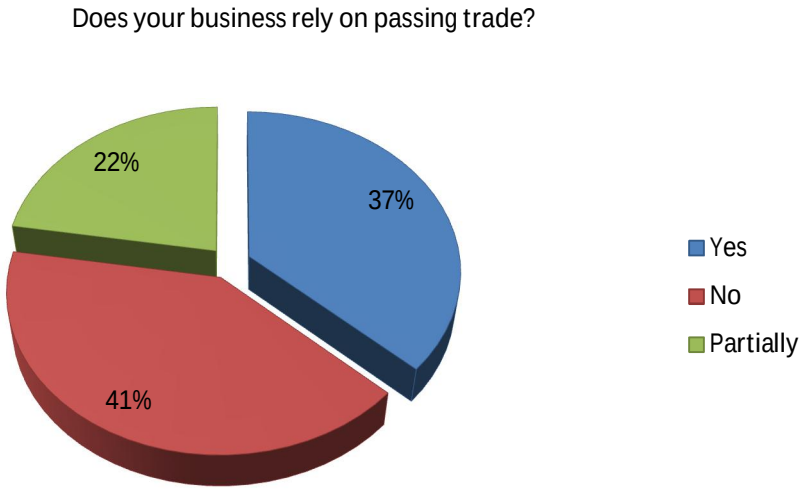
Q12. Who are you primary customers?

From the 106 businesses that were surveyed, 47 per cent indicated that locals were their primary customers, 20 per cent said passing trade and 33 per cent mentioned their primary customers were others, which include specific industries ie music and trades, repeat customers, customers from outside the area and online sales.



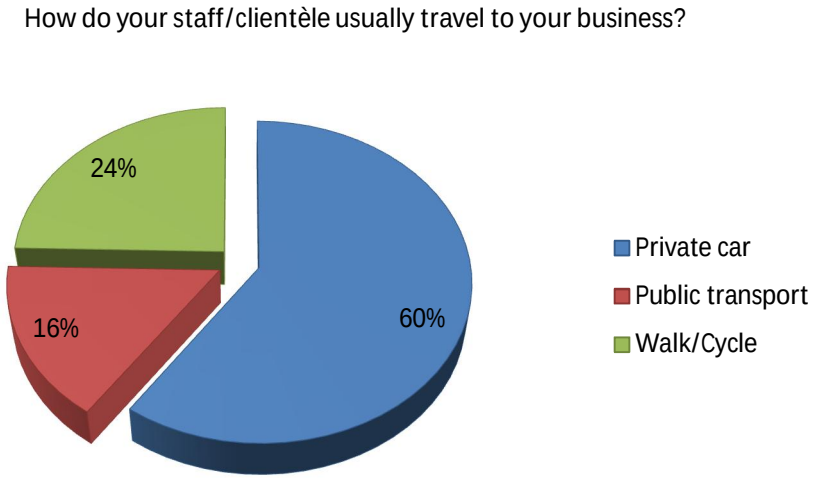
Q13. Does your business rely on passing trade?

The business owners that mentioned they rely on passing trade made up 37 per cent of the businesses surveyed, 41 per cent did not rely on passing trade and 22 per cent stated they partially rely on passing trade.



Q14. How do your staff/clientele usually travel to your business?

The findings from the surveys indicate that the majority of the business owners and their staff/clientele drive to the business, with 60 per cent stating that their primary mode of transport was private car, 24 per cent said that their staff/clientele walk or cycle to the business and 16 per cent use public transport.

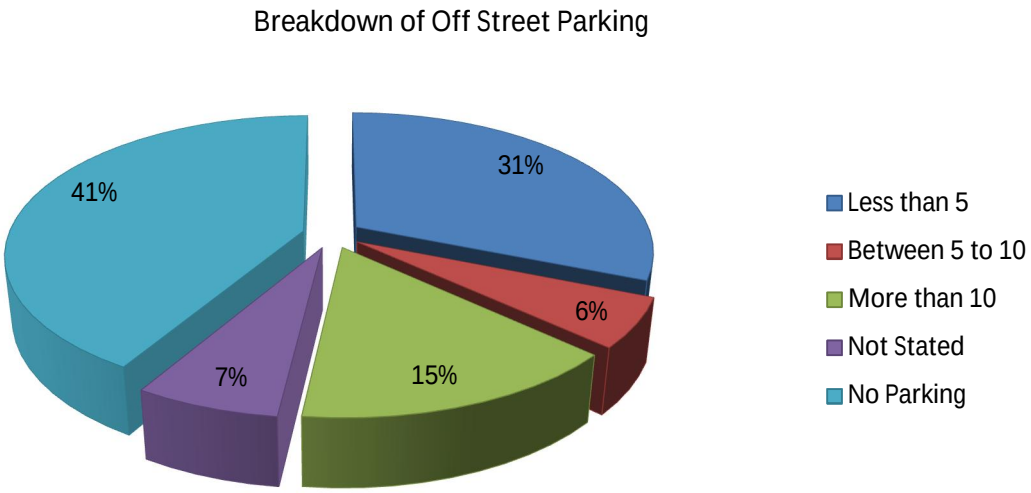


Q15. Do you have off street parking?

Of the businesses surveyed, 55 per cent have off street parking and 45 per cent do not have off street parking.

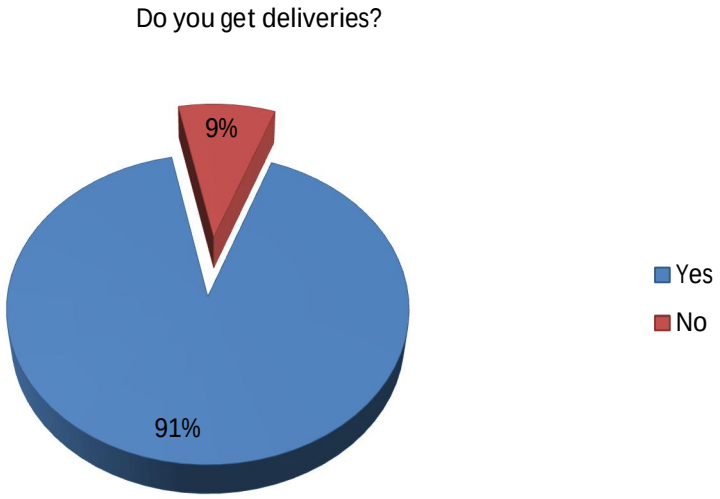
The following graph is a breakdown of the businesses that participated in the survey and are categorised into five groups based on the results received.

Thirty-one per cent of the businesses stated that they had less than five car spaces for off street parking, 15 per cent had more than 10 spaces and 5 per cent had between five to 10 car spaces. Six per cent stated they had off street parking but did not state how many spaces they had and 41 per cent did not have off street parking.



Q17. Do you receive deliveries?

Of the 106 businesses surveyed, 91 per cent stated that they receive deliveries. Fifty-eight per cent of the respondents stated that their deliveries are received on street, 36 per cent received their deliveries off street and six per cent have both options available in which to receive deliveries.



Q20. Business Types

From the businesses surveyed, the business type breakdown is as follows: retail at 33 per cent was the largest portion of business type, food and beverage was the second largest category with 31 per cent, followed by automotive with 13 per cent. Health care business made up 10 per cent, other services made up five per cent, professional services made up four per cent, wholesale business made up two per cent, construction industry made up one per cent and there was one business in the education industry making up one per cent.