WestConnex

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# New M5

## Environmental Impact Statement

### Technical working paper: Social and economic


## Appendix M

November 2015

WestConnex

# WestConnex The New M5

Technical Working Paper: Social and Economic

Client: Roads and Maritime Services

ABN: 76 236 371 088

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# Quality Information

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# 1.0 Introduction

## 1.1 Project overview

NSW Roads and Maritime Services (Roads and Maritime) is seeking approval to construct and operate the New M5 (the project), which would comprise a new, tolled multi-lane road link between the existing M5 East Motorway, east of King Georges Road, and St Peters. The project would also include an interchange at St Peters and connections to the existing road network. The project is shown in Figure 1.

Approval is being sought under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The project is declared to be State significant infrastructure (SSI) under section 115U(2) of the EP&A Act by reason of the operation of clause 14 and Schedule 3 of the *State Environmental Planning Policy (State and Regional Development) 2011*. Accordingly, the project is subject to assessment under Part 5.1 of the EP&A Act and requires the approval of the Minister for Planning. An environmental impact statement (EIS) is therefore also required.

Roads and Maritime is seeking the project to be declared by the Minister for Planning as State significant infrastructure and critical State significant infrastructure under sections 115U(4) and 115V of the EP&A Act.

On 11 August 2015, the Commonwealth Minister for the Environment determined that the project has the potential to significantly impact on a matter of national environmental significance and is therefore a 'controlled action'. This means that approval of the project will be required from the Commonwealth Minister for the Environment in addition to environmental and planning approvals required under State legislation.

Under the Bilateral Agreement relating to environmental assessment (February 2015) between the Commonwealth Government and the NSW Government, this EIS has been adopted for the purpose of meeting the assessment requirements of both the Commonwealth EPBC Act and the NSW EP&A Act.

This technical working paper identifies and assesses the potential social and economic impacts associated with construction and operation of the project and supports the EIS for the project.

## 1.2 Overview of WestConnex

WestConnex is a 33 kilometre motorway that is intended to link Sydney's west with the airport and the Port Botany precinct. The component projects of the WestConnex program of works are:

- M4 Widening – Pitt Street, Parramatta to Homebush Bay Drive, Homebush (planning approval granted on 21 December 2014 and under construction)
- M4 East – Homebush Bay Drive, Homebush to Parramatta Road and City West Link (Wattle Street) at Haberfield (planning application lodged and subject to planning approval)
- New M5 – (the subject of this EIS)
- King Georges Road Interchange Upgrade (planning approval granted on 3 March 2015 and under construction)
- M4-M5 Link – Haberfield to St Peters (undergoing concept development and subject to planning approval)
- Sydney Gateway (is the subject of further investigations by the NSW Government and would be subject to separate planning approval).

Separate planning applications have or will be lodged for each component project. Each project will be assessed separately, but the impact of each project will also be considered in the context of the wider WestConnex program of works.

A proposed Southern extension from Arncliffe to Kogarah is currently being investigated by the NSW Government, and would connect the New M5 to the southern and bayside suburbs of Sydney, and the proposed F6 motorway.

The WestConnex Delivery Authority (WDA) was established by the NSW Government to manage the delivery of the WestConnex series of projects for Roads and Maritime on behalf of the State. The WDA was a public subsidiary corporation of the Roads and Maritime. Following the achievement of early milestones for the WestConnex program of works, the NSW Government took the opportunity to evolve this early governance model.

On 1 October 2015 the transfer of the project delivery functions of WDA to Sydney Motorway Corporation (SMC) was finalised, forming a single decision-making entity to finance and deliver the WestConnex program of works. SMC is a private corporation, the shareholders of which are the Minister for Roads, Maritime and Freight and the Treasurer, with a majority independent board of nine directors.

Roads and Maritime is the Government client agency for the WestConnex program of works. In that capacity Roads and Maritime will enter into contractual arrangements with SMC subsidiary entities which will design, build, own and operate the motorway on behalf of Roads and Maritime. Roads and Maritime and SMC are working together to manage the planning approval process for the project. However, for the purpose of the planning application for the project, Roads and Maritime is the proponent.

## 1.3 Overview of the project

Key components of the project, as shown on Figure 1, include:

- Twin motorway tunnels between the existing M5 East Motorway (between King Georges Road and Bexley Road) and St Peters. The western portals along the M5 East Motorway would be located east of King Georges Road, and the eastern portals at St Peters would be located in the vicinity of the Princes Highway and Canal Road. Each tunnel would be about nine kilometres in length and would be configured as follows:
    - Between the western portals and Arncliffe, the tunnels would be built to be three lanes but marked for two lanes as part of the project. Any change from two lanes to three lanes would be subject to future environmental assessment and approval
    - Between the Arncliffe and St Peters, the tunnels would be built to be five lanes but marked for two lanes as part of the project. Any change from two lanes to any of three, four or five lanes would be subject to future environmental assessment and approval
- Tunnel stubs to allow for a potential future connection to the future M4-M5 Link and a potential future connection to southern Sydney
- Surface road widening works along the M5 East Motorway between east of King Georges Road and the new tunnel portals
- A new road interchange at St Peters, which would initially provide road connections from the main alignment tunnels to Campbell Road and Euston Road, St Peters
- Two new road bridges across Alexandra Canal which would connect St Peters interchange with Gardeners Road and Bourke Road, Mascot
- Closure and remediation of the Alexandria Landfill site, to enable the construction and operation of the new St Peters interchange
- Works to enhance and upgrade local roads near the St Peters interchange
- Ancillary infrastructure and operational facilities for electronic tolling, signage (including electronic signage), ventilation structures and systems, fire and life safety systems, and emergency evacuation and smoke extraction infrastructure
- A motorway control centre that would include operation and maintenance facilities
- New service utilities and modifications to existing service utilities
- Temporary construction facilities and temporary works to facilitate the construction of the project
- Infrastructure to introduce tolling on the existing M5 East Motorway
- Surface road upgrade works within the corridor of the M5 South West Motorway and M5 East Motorway.

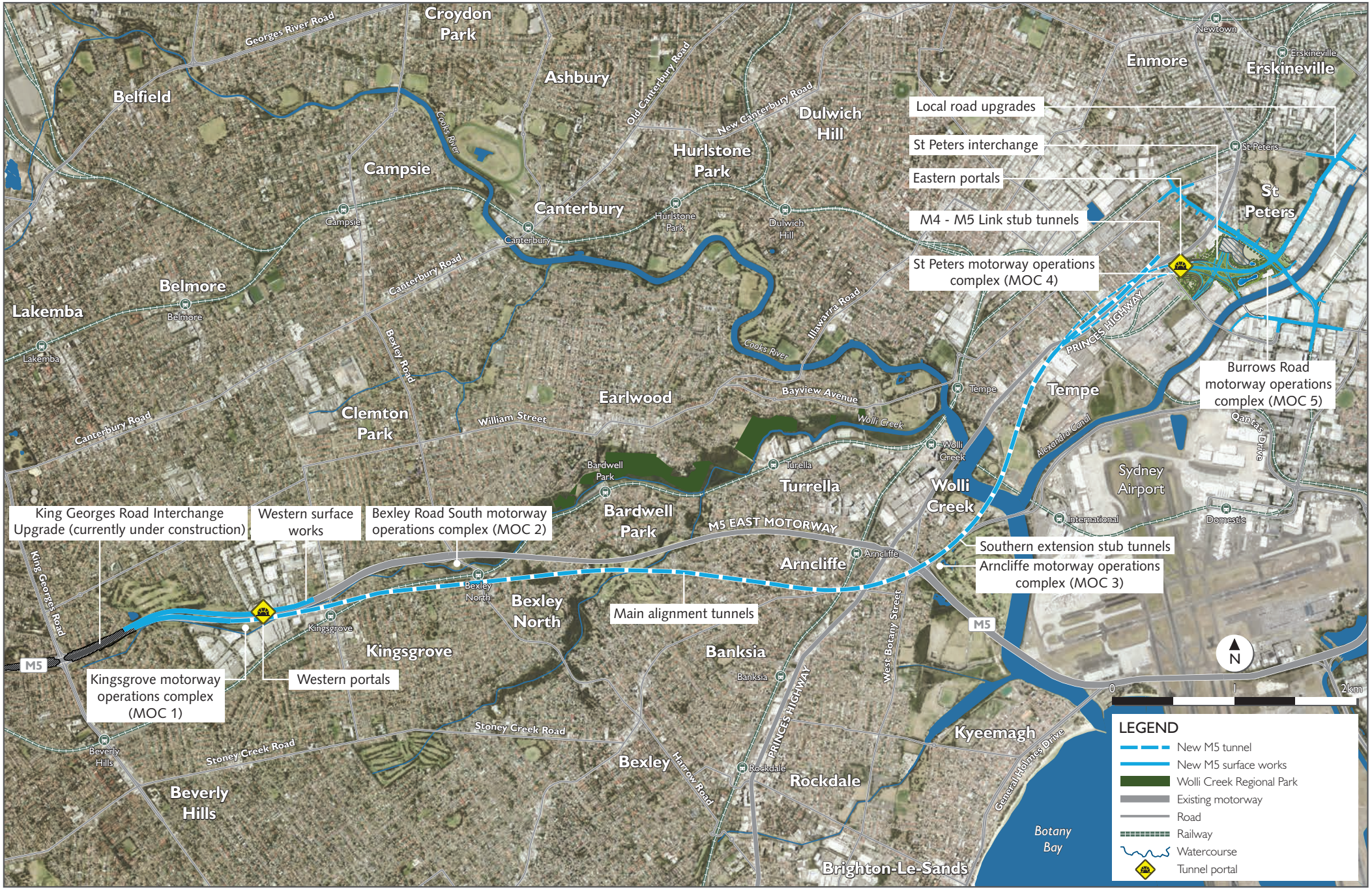


**Figure 1 Key features of the project**

Construction activities associated with the project would generally include:

- Commencement of enabling and temporary works, including construction power, water supply, ancillary site establishment, demolition works, property and utility adjustments and public 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 control centre and ancillary operations buildings
- Upgrades to surface roads and construction of bridges
- Implementation of environmental management and pollution control facilities for the project.

Subject to the project obtaining environmental planning approval, construction of the project is anticipated to commence around mid-2016 and is expected to take around three years to complete.

The M5 Motorway corridor (the M5 East Motorway and the M5 South West Motorway) is the main passenger, commercial and freight corridor between Port Botany, Sydney Airport and south-west Sydney. Traffic demands on the M5 East Motorway currently exceed the design capacity of the roadway, and as a result, present a significant bottleneck to the M5 Motorway corridor with motorists experiencing heavy congestion and unreliable journey times. The project is needed to provide additional capacity along the M5 Motorway corridor, and would allow for a more robust and reliable transport network.

## 1.4 Secretary's Environmental Assessment Requirements

In preparing the Technical Working Paper: Social and Economic, the Secretary's environmental assessment requirements (SEARs) issued for the New M5 project on 5 March 2015, and reissued on 26 August 2015 have been addressed. The key matters raised by the Secretary for consideration in the Technical Working Paper: Social and Economic and where this report addresses the SEARs are outlined in Table 1.

**Table 1 SEARs applicable to the Technical Report: Social and Economic**

| Secretary's Environmental Assessment Requirements | | Section Addressed |
|---|---|---|
| **Direct requirements** | | |
| Social and Economic Impacts | A description of the existing socio-economic environment. | Chapter 3.0 |
| | Social and economic impacts to businesses and the community within the vicinity of the proposal, with associated property acquisition, traffic, access, property, public domain and open space, and amenity and health related changes (including the broader regional impacts associated with the closure of the Alexandria landfill site should this be part of the proposal). | Sections 5.1 and 5.2<br>Sections 6.1 and 6.2 |
| | An assessment of the impact of the proposal on community facilities, including open space and recreational facilities. The assessment must include the use of existing facilities impacted by the proposal, and options and opportunities for the relocation and/or reconfiguration of the community facilities, both temporary and permanent. | Sections 5.1.3 and 6.1.2 |
| **Links with requirements directly dealt elsewhere within the EIS** | | |
| Land Use and Property Impacts | Impacts on directly affected properties and land uses, including impacts related to access, land use, settlement and subsidence associated with tunnel excavation, property acquisition (including relocations and expenses | Chapter 13 (Land use and property) and Chapter 19 (Groundwater) of the |

| Secretary's Environmental Assessment Requirements | | Section Addressed |
|---|---|---|
| | for those properties acquired) and amenity related changes. | EIS |
| | Where there are potential impacts to the OEH estate reserved under the National Parks and Wildlife Act 1974 or where the proposal is located upstream of OEH estate, an assessment of the matters to be considered outlined in the Guidelines for developments adjoining land and water managed by DECCW (DECCW 2010). | Chapter 13 (Land use and property) of the EIS |
| Urban Design and Visual Amenity | Opportunities for local centre and street revitalisation near the St Peters interchange. | Appendix L (Urban design report) |
| Utility Impacts | Potential impacts on utilities (including communications, electricity, gas, and water and sewerage) and the relocation of these utilities. | Chapter 13 (Land use and property) of the EIS |
| Community Consultation | A draft Community Consultation Framework identifying relevant stakeholders, procedures for distributing information and receiving/responding to feedback and procedures for resolving stakeholder and community complaints during construction and operation.<br>Key issues that must be addressed in the draft Strategy include:<br>- traffic management (including property access, pedestrian access),<br>- landscaping/urban design matters,<br>- construction activities including out of hours work, and<br>- noise and vibration mitigation and management. | Chapter 7 (Consultation) of the EIS and Appendix L (Urban design report) |

## 1.5 Purpose of this report

Construction and operation of the project is expected to have social and economic benefits and impacts on communities and groups within and in the vicinity of the project corridor. The purpose of this report is to identify and assess the social and economic impacts of the project and to identify management and mitigation measures to address the identified impacts.

The social and economic impact assessment considers the direct, indirect and cumulative social and economic impacts (where relevant) on the following groups / communities:

- Residents (directly affected, local and regional).
- Businesses.
- Users of education, health and other community services and facilities.
- Users of open space and recreational facilities.
- Commercial road users including freight transport operators.
- Private road users.

This assessment provides an overview of the existing social and economic environments in which the project is located and the communities and businesses impacted (positively and negatively) by the project. The potential impacts are the outcome of the interaction between the project and the existing environment and are considered from local and regional perspectives.

## 1.6 Study area

The study area for the social and economic impact assessment has been identified as the geographical statistical areas (as defined by the Australian Bureau of Statistics (ABS) (Australian Bureau of Statistics, 2011)) that encompass the project, as well as the wider catchment as it relates to the use of the New M5 Motorway.

The following Local Government Areas (LGAs) have been identified as the areas that are most likely to experience social or economic impacts due to the project:

- Canterbury LGA;
- Hurstville LGA;
- Rockdale LGA;
- Marrickville LGA;
- Botany Bay LGA; and
- Sydney LGA.

The LGAs comprising the study area for the social and economic impact assessment are shown in Figure 2.

As the majority of the project would be in tunnels, direct impacts would be limited to areas close to the western (eg Kingsgrove and Beverly Hills) and eastern (eg St Peters) extents of the project and at other locations where temporary (construction) and permanent (operational) surface infrastructure facilities are proposed for the project.

While social impacts generally occur on a community level, business impacts such as changes to turnover or employment generally occur at the location of the business activity. This is due to the fact that businesses generally rely on the attractiveness and accessibility of their location to induce business activity. As such, businesses that are located far beyond the boundaries of the project are unlikely to be impacted by the project, unless they rely on the project corridor for freight or delivery purposes.

The study area is used as a thoroughfare for freight and commercial activity linking south-western Sydney to Port Botany and Sydney Airport. Therefore, some impacts related to freight and commercial movement would occur beyond the scope of the study, at a state-wide or national level.


**Figure 2 Social and economic statistical areas**

## 1.7 Report structure

This report is structured as follows:

- **Chapter 1** – Introduction – outlines the project and presents the purpose of the report.
- **Chapter 2** – Methodology – describes the methodology employed for this technical working paper.
- **Chapter 3** – Existing environment – presents the current social and economic characteristics of the study area.
- **Chapter 4** – Consultation and key stakeholders – outlines the key social and economic issues identified through consultation with key stakeholders and identifies where these issues are addressed in the report.
- **Chapter 5** – Impact assessment - Construction – describes the potential social and economic impacts resulting from the construction of the project.
- **Chapter 6** – Impact assessment – Operation – describes the potential social and economic impacts resulting from the operation of the project.
- **Chapter 7** – Mitigation and management - provides a summary of environmental mitigation, management and monitoring responsibilities in relation to social and economic impacts of the project.
- **Chapter 8** – Conclusion.
- **Chapter 9** – References.
- **Appendix A** Socio-economic profile – provides a detailed set of data tables for the social and economic characteristics of the study area.
- **Appendix B** Community Infrastructure – presents a list of community facilities identified in the study area.

# 2.0 Methodology

The Technical Report: Social and Economic has been undertaken in accordance with the guidance presented in the *Roads and Maritime Services Socio-economic Assessment Practice Note* (Roads and Maritime Services, 2013). A comprehensive level of assessment has been adopted in accordance with Roads and Maritime's guidance.

The methodology for this study covers the existing social and economic context, an assessment of impacts (positive and negative) and mitigation measures as follows:

- A definition of the relevant study area for the project, taking into account the extent or scale of the potential impacts of the project, including both direct and indirect impacts, and the context of the area surrounding the project;
- A profile of the project area and surrounds, including relevant statistics to provide a better understanding of the social and economic circumstances of the project area that will be potentially affected by the project;
- A description of groups or particular communities that may be affected by the project, including directly impacted property owners, the general community, local businesses and road users (including freight and commercial vehicles), as well as those indirectly affected through traffic impacts, including public transport routes and cycling restrictions. Economic impacts are considered at a local and regional level, where appropriate;
- An assessment of the impacts of the project with regard to property impacts, business impacts, community facilities, open space, public domain, community values, as well as access and connectivity. The focus is mainly on directly affected properties but will also consider those in the vicinity of the project, as well as impacts on through traffic and transport movements in the project area;
- A cumulative assessment of the social and economic impacts of all phases of the project, combined with the impacts of other relevant planned and anticipated projects; and
- Identification of measures to mitigate or manage the social and economic impacts as a result of the project.

The preparation of the EIS has not included direct consultation with businesses, individuals or industry groups by the EIS team. The use of information obtained from primary research was limited to that undertaken by the project community consultation team.

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.

The impacts on property values prior to and during construction would be of a temporary nature:

- Prior to construction, uncertainty amongst property owners about property acquisition and the magnitude of potential amenity, accessibility and construction traffic impacts can influence an owner's perceived value of his/her property;
- During construction, the impact of the project on the perceived value of a property would not occur uniformly across all properties in proximity to the project as it would be influenced by the specific location of the individual property and the type, magnitude and direction of potential impacts.

The long term impact of the project on property values would be influenced by the long term benefits of the project as perceived in the land and property markets, arising from general overall improvements in amenity, including improved air quality, reduced traffic noise and improved road safety on local surface roads as traffic is diverted from them to the new tunnel. It is very 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.

## 2.1 Economic multipliers

Economic multipliers are used to quantify economic impacts or changes in economic activity resulting from a stimulus such as the carrying out of the project. These multipliers can be calculated from input-output tables. The Australian Bureau of Statistics (ABS) prepares a national input-output table, the most recent being for 2009/10 (ABS*, Australian National Accounts: Input-Output Tables 2009/10, 5209.0.55.001*, 20 September 2013). The table describes inter-industry transactions among 114 industries, showing the fixed amounts of inputs that are required to produce a given output at the national level. The table is compiled in accordance with the Australian national accounting system, and international Government accounting standards.

State-level input-output tables can be derived by adjusting the national table to reflect each state's inter-industry transactions and final demand flows, based on information and data at the state level within the Australian national accounting system and on the latest Census data.

Four multipliers are usually used to measure economic impact: output (value of production or turnover), value added (which can be directly compared to gross domestic product and gross state product), household income and employment. From these four, two types of multipliers can be calculated:

- Type 1 multipliers, which measure the direct and production-induced impacts of a stimulus or activity – the latter impacts refer to the subsequent rounds of purchases of inputs by businesses supplying the direct suppliers of the stimulus or activity (industrial flow-on effects).
- Type 2 multipliers, which capture the Type 1 effects and also measure the consumption-induced effects that flow from the expenditure of income that is earned from the production of additional output.

Type 1 multipliers have been used for the quantification of economic impacts and changes in economic activity in this SEIA. These multipliers measure the industrial response to the project in terms of value of output (turnover), value added (turnover net of purchases of intermediate goods and services), wages and salaries paid and size of workforce (number of employees). They do not measure the consumption-induced response to the project which Type 2 multipliers measure, ie. the change in wages and salaries paid is spent on commodities and will induce further changes in production by all industries (the change in output resulting from this further induced production is the consumption-induced output). However, Type 2 multipliers often result in an overestimation of economic impacts due to the simplifying assumptions implicit in an input-output model from which economic multipliers are derived.

Input-output multipliers are based on a number of assumptions that provide a relative measure (to be compared with other industries) of the interdependence between one industry and the rest of the economy. This interdependence arises solely from the sales and purchase links between industries and is based on estimates of transactions occurring over a recent historical period. The limitations of input-output analysis therefore include:

- Lack of supply-side constraints – it is assumed that extra output can be produced in one area without taking resources away from other activities, thus potentially overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or near capacity.
- Fixed prices – it is assumed that any change in the demand for productive factors would not induce any change in their cost.
- Fixed ratios for intermediate inputs and production – it is assumed that there is a fixed input structure in each industry and fixed ratios for production (as described by fixed technological coefficients).
- No allowance for purchasers' marginal responses to change – it is assumed that households consume goods and services in exact proportion to their initial budget shares and that this applies equally to industrial consumption of intermediate inputs and factors of production.
- Absence of budget constraints – it is assumed for consumption-induced effects (Type 2 multipliers) that household and government consumption is not subject to budget constraints.

It is preferable to apply Type 1 multipliers, because an input-output model is based on the above simplifying assumptions which have the effect of imposing few constraints to economic expansion. As a result, Type 2 multipliers could overstate potential impacts, particularly where assessing the expansion of an existing activity rather than the contribution of an existing activity.

# 3.0 Existing environment

The following profile of the existing social and economic environment of the study area has been informed by the most recent release of the *Australian Census of Housing and Population* (Australian Bureau of Statistics, 2012), unless otherwise stated. As this census was undertaken in 2011, there may be some minor discrepancies in the representation of the current characteristics of the local, regional and state economies.

The study area adopted for this assessment is presented in Section 1.6 of this report. The geographical area of comparison is Greater Sydney Greater Capital City Statistical Area (GCCSA), as defined by the Australian Bureau of Statistics (Australian Bureau of Statistics, 2011)

The social environment of the study area is profiled in Section 3.1 and the economic environment of the study area is profiled in Section 3.2. A detailed set of data tables are provided at Appendix A.

## 3.1 Social

### 3.1.1 Population and demography

The following indicators provide the population and key demographics of people that reside in the study area and how they compare against the Greater Sydney GCCSA:

- **Population:** The latest ABS Population statistics estimated that the resident population in the study area was approximately 660,000 in 2013 (Australian Bureau of Statistics, 2014). Between 2012 and 2013, the total population in the study area grew by 1.7 per cent. Marrickville LGA experienced the slowest growth in the study area at one per cent over this period. Botany Bay LGA and Sydney LGA experience the highest one-year growth in the study area of 2.3 per cent. Five-year growth (2008 to 2013) in the study area was 8.5 per cent and higher than the Greater Sydney and New South Wales average growth rates over the same period. Between 2008 and 2013, Canterbury LGA experienced the smallest growth in the study area of 6.3 per cent and Botany Bay LGA experienced the largest growth in the study area of 12.1 per cent.
- **Projected Population:** The NSW Department of Planning and Environment (Department of Planning and Environment (DPE), 2014) estimated that the population of the study area will reach approximately 850,000 residents in 2031. Between 2011 and 2031, it is estimated that Canterbury LGA will experience the smallest growth, with the population growing by 25 per cent over this period. Over the same period, Sydney LGA will experience the largest growth, with the population growing by 49 per cent.
- **Age:** The median age in Greater Sydney was 36 years in 2011. Sydney LGA had the lowest median age in the study area at 32 years. Hurstville and Botany Bay had the highest median ages in the study area at 37 years.

  The study area had a lower proportion of residents 14 years or younger than Greater Sydney (19.1 per cent) in all LGAs except for Canterbury (20.0 per cent). Sydney LGA had only 7.1 per cent of residents 14 years or younger. Between 2006 and 2011, the proportion of residents 14 years or younger in both the study area and Greater Sydney decreased or remained stable, except in Marrickville LGA, where residents 14 years or younger increased by 0.8 per cent.

  The study area also had a lower proportion of residents 65 years or older than Greater Sydney (12.8 per cent). Sydney LGA also had the lowest proportion of residents 65 years or older at 7.9 per cent. Canterbury, Hurstville, Rockdale and Botany Bay LGAs had greater proportions of residents 65 years or older than Greater Sydney. Between 2006 and 2011, the proportion of residents 65 years or older in the study area decreased or remained stable, except in Botany Bay LGA, where residents 65 years or older increased by 0.1 per cent. Over the same period, Greater Sydney experienced an increase in residents 65 years or older of 0.6 per cent.
- **Indigenous Population:** In 2011, one per cent of residents in the study area identified as indigenous. Marrickville (1.5 per cent), Botany Bay (1.6 per cent) and Sydney (1.3 per cent) LGAs have a higher proportion of indigenous residents than the Greater Sydney average (1.2 per cent). Canterbury, Hurstville and Rockdale LGAs had comparatively low indigenous resident populations (0.6 per cent) compared to the Greater Sydney average.

- **Cultural Diversity:** Overall, the study area had a larger proportion of residents born overseas than the Greater Sydney average of 33.9 per cent. Canterbury LGA had the largest proportion of overseas born residents at 48.1 per cent of the population and Marrickville LGA had the lowest proportion of overseas born residents at 34.1 per cent.
- **Language:** On average, a greater proportion (45.2 per cent) of residents in the study area speaks a language other than English (LOTE) at home compared with Greater Sydney (32.1 per cent). Canterbury LGA had the highest proportion of LOTE residents at 63.9 per cent of the population. Sydney LGA had the lowest proportion of LOTE residents at 29.9 per cent. Arabic (13 per cent), Greek (13 per cent), Mandarin (12 per cent) and Cantonese (11 per cent) were the most frequent LOTEs spoken in the study area.
- **Need for assistance:** In 2011, the study area had 4.3 per cent of residents that required assistance for core activities. Canterbury (5.3 per cent), Hurstville (4.7 per cent), Rockdale (5.3 per cent) and Botany Bay (5.0 per cent) all had higher proportions of residents that needed assistance with core activities than the Greater Sydney average (4.4 per cent). Sydney LGA had the lowest proportion of residents that have need for assistance with core activities at 2.5 per cent.

The above indicators suggest that the study area has experienced significant growth in its population over the last five years and will continue to do so over the next 20 years. The area is culturally diverse with a large proportion of residents born overseas or speaking a language other than English at home. Growth in residents under 14 years and over 65 years of age is low across the study area and these statistics suggest that the study area is not experiencing the ageing population trend to the same extent as Greater Sydney or the rest of Australia.

### 3.1.2 Families and housing

The following indicators provide family and housing characteristics of the study area and how they compare against the Greater Sydney GCCSA:

- **Population mobility:** Residents in Marrickville and Sydney LGAs are highly mobile. In 2011, 16.9 per cent and 24.7 per cent of residents (respectively) lived at a different address in 2010 and 43.9 per cent and 55.7 per cent of residents (respectively) lived at a different address in 2006. The remainder of LGAs in the study area had lower proportions of residents that lived elsewhere one-year and five-years ago than the Greater Sydney average of 13.6 per cent and 37.2 per cent, respectively.
- **Dwelling structure:** In 2011, the study area had a total of 225,151 private occupied dwellings. The study area had a lower proportion of separate houses (33.8 per cent) and a higher proportion of flats/units/apartments (48.3 per cent) than the Greater Sydney averages (60.9 per cent and 25.8 per cent, respectively). Sydney LGA had the lowest proportion of separate houses (4.2 per cent) and highest proportion of flats/units/apartments (73.6 per cent). Hurstville LGA had the highest proportion of separate houses (59.0 per cent) and lowest proportion of flats/units/apartments (28.2 per cent). Marrickville and Sydney LGAs also had high proportions of semi-detached houses at 27.5 per cent and 21.2 per cent respectively.
- **Household size:** The average household sizes in Canterbury LGA (2.8 people per household), Hurstville LGA (2.8 people per household) and Rockdale LGA (2.7 people per household) were equal to, or higher, than the Greater Sydney average of 2.7 people per household. Marrickville (2.3 people per household), Botany Bay (2.6 people per household) and Sydney (1.9 people per household) had smaller households than the Greater Sydney average.
- **Household composition:** The most common household composition in the study area was a family household (62.9 per cent). Canterbury and Hurstville LGAs had a larger proportion of family households (75.4 per cent and 75.1 per cent, respectively) than the Greater Sydney average of 73.1 per cent. The remaining LGAs in the study area all had lower proportions of family households than the Greater Sydney average. Sydney LGA had a low proportion of family households (45.9 per cent) and non-family households were more common in Sydney LGA (54.1 per cent).
- **Family type:** Of those households that identified as family households in the study area, the majority of these families were couple families with children (41.7 per cent). The study area had a lower proportion of couple families with children than Greater Sydney (48.9 per cent) but a higher proportion of couple families with no children (40.1 per cent) than Greater Sydney (33.5 per cent). In Canterbury, Hurstville, Rockdale and Botany Bay LGAs, couple families with children were the most common families, followed by couple families with no children, one parent families with children and then other undefined family types. Couple families with no children were the most common family type in Marrickville and Sydney LGAs.

- **Housing tenure:** Renting was the most popular housing tenure in Marrickville (43.0 per cent), Botany Bay (37.6 per cent) and Sydney (59.8 per cent) LGAs, followed by owning with a mortgage and then owning outright. Renting was also the most popular housing tenure in Canterbury LGA (36.5 per cent), followed by owning outright (30.7 per cent). Hurstville and Rockdale LGA residents were more likely to own their dwelling outright than any other tenure type (36.1 and 34.5 per cent, respectively). Owning with a mortgage was the most common tenure across Greater Sydney (34.8 per cent), followed by renting (31.6 per cent) and then owning outright (30.4 per cent).

The above indicators suggest that family and housing compositions differ widely across the study area. Residents in the south and west of the study area are less mobile, more likely to live in larger family households and live in standalone houses or dwellings. Those residents that live closer to the Sydney CBD tend to be more mobile, live in smaller households of either family or non-family arrangements and are more likely to live in apartments/units/flats.

### 3.1.3 Socio-Economic Index for Areas (SEIFA)

Socio-Economic Index for Areas (SEIFA) (Australian Bureau of Statistics, 2012) is produced by the ABS as an indicator of relative socio-economic advantage and disadvantage. The SEIFA publication consists of four indexes. The index of relative socio-economic advantage and disadvantage (IRSAD) has been used for this assessment.

IRSAD assesses the economic and social welfare of individuals within an area and scores the area relative to the rest of Australia. An index score of 1,000 represents the median score across Australia. A score higher than 1,000 indicates an area has a relative advantage over the Australian average, where as a score lower than 1,000 indicates an LGA has a relative disadvantage relative to the Australian average. A decile ranks areas into 10 groups according to their scores, with a decile of '1' being the lowest 10 per cent of areas and a decile of '10' being the highest 10 per cent of areas. A decile enables the determination of where the area sits in comparison to the rest of Australia.

Sydney, Marrickville, Rockdale and Hurstville LGAs all received IRSAD scores over 1,000 indicating that these LGAs have a relative social advantage above the national median. Sydney LGA and Marrickville LGAs had deciles of 9 and Rockdale and Hurstville LGAs had deciles of 8. These LGAs are in the top 20-30 per cent of Australia in terms of socio-economic advantage. Canterbury and Botany Bay LGAs received ISRAD scores under 1,000, with Canterbury LGA receiving a decile of 4 and Botany Bay LGA receiving a decile of 7.

SEIFA suggests that socio-economic conditions differ widely across the study area. Sydney, Marrickville, Rockdale and Hurstville LGAs represent relatively advantaged areas, while Canterbury and Botany Bay LGAs are relatively disadvantaged compared to other areas with higher index scores.

### 3.1.4 Labour force and household income

The following indicators provide labour force and household income characteristics for residents of the study area and how they compare against the Greater Sydney GCCSA:

- **Household income:** In the study area, the median household incomes for the LGAs ranged between $1,029 per week and $1,639 per week. Sydney LGA ($1,639 per week) and Marrickville LGA ($1,605 per week) had median household incomes above the Greater Sydney median household income of $1,447 per week. The remaining LGAs in the study area had median household incomes lower than the Greater Sydney median household income. Canterbury LGA had the lowest median household income of the study area at $1,029 per week.
- **Low household income:** Households that have a total household income less than $500 per week are considered to be low income households. As this threshold is not published as part of the ABS 2011 Census of Housing and Population, households earning less than $399 per week and $599 per week have been presented.

  Overall, the study area had a larger proportion of households (12.9 per cent) earning less than $399 per week than Greater Sydney (10.7 per cent) and a larger proportion of households (20.6 per cent) earning less than $599 per week than Greater Sydney (18.2 per cent). Canterbury and Botany Bay LGAs had the largest proportions of households earning less than $399 per week (14.5 per cent and 14.4 per cent, respectively) and less than $599 per week (25.4 per cent and 22.8 per cent, respectively). Marrickville LGA was the only LGA in the study area to have a lower proportion of households earning less than $399 per week (9.8 per cent) and $599 per week (16.3 per cent) than the Greater Sydney averages.

- **Labour force participation:** In 2011, the total labour force of the study area was 510,205 residents. Full-time employment represented 62.5 per cent of the labour force and part-time employment represented 25.0 per cent of the labour force. This was a similar distribution to Greater Sydney, with full-time employment accounting for 62.1 per cent of the labour force and part-time employment accounting for 26.7 per cent of the labour force. Canterbury LGA had the lowest proportion of full-time employment (57.6 per cent) and highest proportion of part-time employment (27.9 per cent) in the study area. Conversely, Sydney LGA had the highest proportion of full-time employment (68.1 per cent) and lowest proportion of part-time employment (21.8 per cent) in the study area.
- **Unemployment:** Overall, the study area had a higher unemployment rate (6.2 per cent) than Greater Sydney (5.7 per cent). Marrickville and Botany Bay LGAs had lower unemployment rates than Greater Sydney (both at 5.3 per cent). Canterbury LGA had the highest unemployment rate at 8.2 per cent.
- **Occupation:** Residents in the study area were most commonly employed in professional occupations, followed by clerical/administrative occupations. In Sydney LGA, the most common occupations of residents were professional occupations (38.8 per cent), followed by managerial occupations (16.5 per cent).
- **Industry of employment:** The most common industries of employment for the labour forces of Canterbury, Hurstville, Rockdale and Botany Bay LGAs were Retail Trade (10.9 per cent, 9.9 per cent, 10.0 per cent and 10.1 per cent, respectively) and Health Care/Social Assistance (10.3 per cent, 10.4 per cent, 10.5 per cent and 11.2 per cent). Professional/Scientific/Technical Services was the most common industry of employment for workers living in Marrickville and Sydney LGAs (12.2 per cent and 16.8 per cent, respectively). The next most common industry of employment in Marrickville LGA was Health Care/Social Assistance (11.0 per cent), followed by Education and Training (10.9 per cent). Financial and Insurance Services (10.1 per cent) and Accommodation/Food Services were the second and third most common industries of employment in Sydney LGA.

The above indicators suggest that employment characteristics and incomes differ widely across the study area. Residents in Sydney and Marrickville LGAs tend to have higher incomes, higher labour force participation and more white-collar workers. In the south and west of the study area, residents had lower incomes, lower labour force participation and more residents working in retail trade and health care/social assistance industries.

### 3.1.5 Recreational and community infrastructure

The study area is home to a significant amount of recreational and community infrastructure essential to meeting the needs of the local and regional communities. The study area is a well-established suburban area and consequently features a wide variety of community facilities and services catering to the educational, cultural, health and social needs of residents. Recreational and community infrastructure that may potentially be directly or indirectly impacted by the project have been identified in the following sections and are shown on Figure 3 to Figure 6.

#### Educational facilities

Educational facilities in the study area include child care centres, primary schools, secondary schools and tertiary education facilities. The provision of educational facilities in the study area meets the diverse needs of the community, including educational facilities for a variety of religions and to meet special educational needs. Educational facilities in proximity to project surface works are summarised in Table 2 and their locations mapped on Figure 3 to Figure 6.

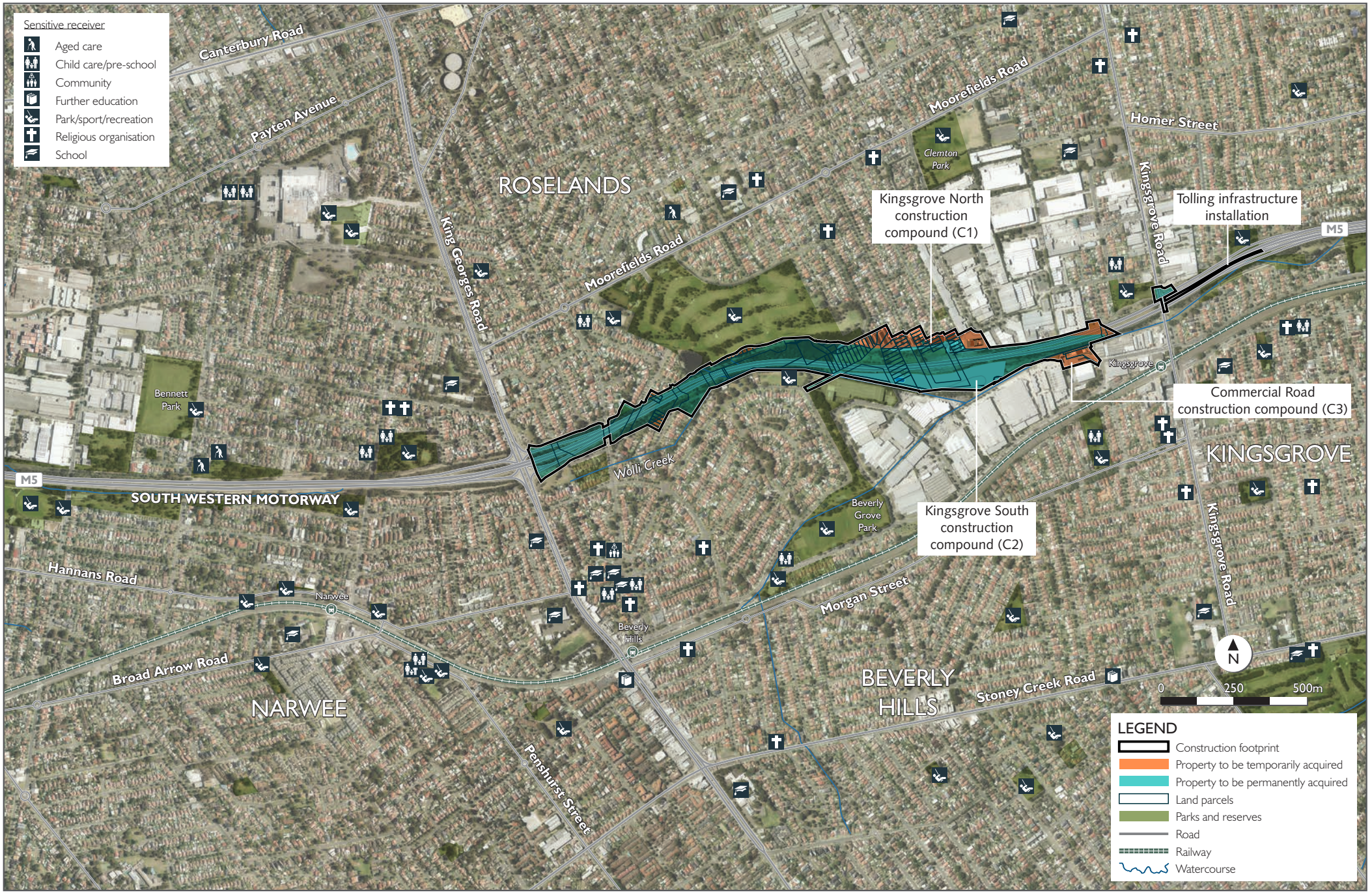


**Figure 3 Sensitive receivers and community infrastructure in proximity to the Western and Kingsgrove Road surface works**

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**Figure 4 Sensitive receivers and community infrastructure in proximity to the Bexley Road surface works**

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**Figure 5 Sensitive receivers and community infrastructure in proximity to the Arncliffe surface works**

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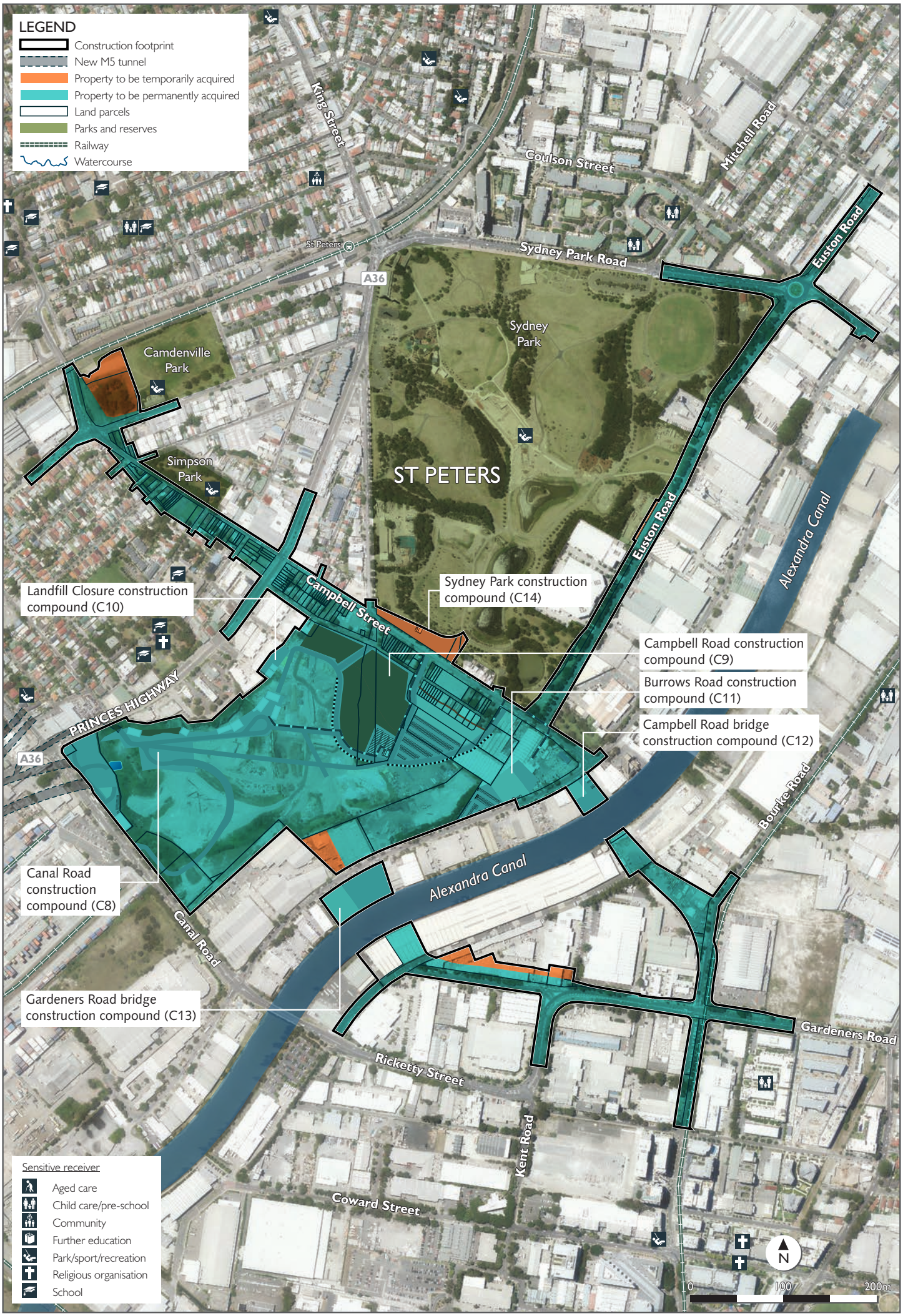


**Figure 6 Sensitive receivers and community infrastructure in proximity to the St Peters interchange**

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**Table 2 Educational facilities in proximity to project surface works**

| Project area | Child care facilities | Primary schools | High schools | Tertiary education facilities |
|---|---|---|---|---|
| Western surface works | - Active Kids Beverly Hills<br>- Active Kids Narwee<br>- Barfa Bear Child Care Centre<br>- Footsteps Early Learning Centre<br>- Footsteps Early Learning Centre Oosh School Care<br>- Kingsgrove World of Learning<br>- Kids Oasis Childcare Centre | - Regina Coeli Catholic Primary School<br>- Beverly Hills North Public School<br>- McCallums Hill Public School | - Beverly Hills Girls High School<br>- Kingsgrove North High School<br>- St Ursula's College Catholic Girls High School | None in proximity to the works |
| Bexley surface works | None in proximity to the works | - Clemton Park Public School | None in proximity to the works | Booth College, School for Christian Studies, Bexley North (Salvation Army) |
| Arncliffe surface works | - Busy Bee Long Day Child Care Centre<br>- Do Re Mi Long Day Care Centre | - Arncliffe Public School<br>- St Francis Xavier's Catholic Primary School | None in proximity to the works | None in proximity to the works |
| St Peters interchange | - Active Kids Mascot<br>- Building Blocks Early Learning & Child Care Centre Alexandria<br>- Sydney Park Child Care Centre<br>- Lady Gowrie Child Centre Newtown<br>- Camdenville Public School Preschool | - Camdenville Public School<br>- St Peters Public School<br>- Newtown Public School<br>- Alexandria Park Community School (kindergarten to year 12) | - Alexandria Park Community School (kindergarten to year 12)<br>- Tempe High School<br>- Newtown High School of the Performing Arts | - Sydney TAFE Design Centre Enmore |

Child care centres and primary schools within the study area would mainly draw students from the local area, accommodating residents within a local catchment around each facility. High schools and tertiary education facilities are more likely to draw from a wider catchment, particularly where they are situated close to public transport services or provide specialist education services, such as the Newtown High School of the Performing Arts or Sydney TAFE facilities.

A more detailed list of educational facilities identified within the study area is provided in Appendix B.

**Health, emergency and aged care**

The study area is home to a number and variety of health care, emergency and aged care facilities to meet the needs of local and regional communities including, hospitals, medical centres, community health centres, ambulance stations, police stations, fire stations and aged care facilities.

These include:

- Arncliffe Fire Station
- Beverly Hills State Emergency Service (SES
- Kingsgrove Police Station
- Kingsgrove Health Professional Centre
- Kingsgrove Day Hospital
- Kings Medical Clinic
- Royal Freemans' Benevolent Institution (RFBI) Moorefields Masonic Village
- Bexley Gardens Retirement Village
- Tom Foster Community Care
- Marrickville SES
- Newtown Police Station
- Newtown Fire Station
- Macquarie Lodge Retirement Village.

Kingsgrove Day Hospital, located on Kingsgrove Road is the closest hospital to project works. Arncliffe Fire Station is located near the Kogarah Golf Course. No other hospitals or emergency services are located in the immediate vicinity of project works.

Aged care facilities are located near project works at the western surface works, Kingsgrove surface works and Bexley Road surface works include:

- Royal Freemasons' Benevolent Institution (RFBI) Moorefields Masonic Village, Roselands; and
- Bexley Gardens Retirement Village, Bexley North.

In the vicinity of the St Peters interchange, the Tom Foster Community Care provides services to older people, people with a disability and carers who live in their homes in Marrickville LGA. No other aged care facilities are located in the immediate vicinity of project works.

**Sport, recreational and cultural facilities**

The study area has a considerable amount of passive and active open space and a number of sporting facilities, places of worship, community halls and recreational facilities. Areas for passive and active recreation are important in the study area, with waterways such as Wolli Creek and the Cooks River providing opportunity for parks and open space and thus encouraging active living for the community. Open space in the vicinity of the project is identified in Figure 3 to Figure 6.

Walking and cycle paths are present in the study area including areas along the Cooks River, Wolli Creek and the M5 East Motorway (known as the M5 Linear Park) and Sydney Park.

The M5 Linear Park incorporates local open spaces such as Beverly Grove Park, Forrester Reserve, Kingsbury Reserve and Kingsgrove Avenue Reserve, and comprises an off-road shared path that runs parallel to the M5 Motorway corridor between Belmore Road, Riverwood and Bexley Road, Kingsgrove. As such, the M5 Linear Park does not have a set boundary. Instead it comprises of a cycling and pedestrian path that traverses through existing park lands and reserves or along road corridors or pathways adjacent to the M5 East Motorway where no open space is available. West of King Georges Road, the shared path is only on the southern side of the motorway, while east of King Georges Road, there is a shared path north and south of the motorway until Bexley Road. A number of north-south crossings are available along the length of the path at roadways (eg King Georges Road and Cooloongatta Road) and at underpasses beneath the motorway (eg the Kindilan underpass through Beverly Grove Park).

Canterbury Golf Course is located in Beverly Hills and is a public 9-hole course. Kogarah Golf Course is an 18-hole golf course located adjacent to the Cooks River in Arncliffe. Kogarah Golf Course has been in existence for over 80 years and also provides club facilities.

The Wolli Creek Trail commences east of Bexley Road and connects to Waterworth Park at Earlwood located near the confluence of Wolli Creek and Cooks River. It loosely follows the meander of Wolli Creek.

The Barton Park public driving range is south of the Kogarah Golf Course and bordered by Riverine Park and Banksia Field. Riverine Park contains play equipment and a baseball field, as well as playing fields that are used for local sporting competitions.

Bestic Street and Eve Street cycleways are located within Riverine Park and Banskia Field. This cycleway provides connections between areas south of Banksia and Kyeemagh and to the north via Marsh Street and the Princes Highway. Eve Street wetland (closed to the public) is also located adjacent to the M5 East Motorway.

Sydney Park provides both passive and active open space. The park has several walking and cycle paths, playing fields and playgrounds. A number of local sporting and community clubs use Sydney Park, such as the South Sydney District Cricket Club, the Newtown Swans Junior AFL team and St Peters Parkrun. The Sydney Park Cycling Centre, a series of signalised cycle paths for families to learn about cycle and road safety, is also located within the park. Sydney Park is also home to walking and cycle paths used by residents and community groups.

Smaller parks are present in St Peters, including Simpson Park, May Street Reserve and Camdenville Park. Simpson Park and Camdenville parks contain play equipment and service the immediate residential community and workforce in St Peters and Marrickville. Camdenville Park, the larger park of the two, also includes playing fields. Marrickville Council is proposing to upgrade the park to provide additional recreational uses, including BMX tracks. May Street Reserve is a small park provide rest amenities.

Cycle paths at the eastern end of the project include a dedicated cycle path along Bourke Road, with cycle routes nominated along roads where dedicated facilities are not provided. Current planning and longer term strategies by the NSW Government, City of Sydney Council and Botany Bay Council in this area have identified opportunities to enhance cycle paths including:

- The Airport Cycleway along the Alexandra Canal to Coward Street, which along with the Bourke Road cycleway, would form a major north-south cycling corridor (*Sydney's Cycling Future* (Transport for NSW, 2013))
- City of Sydney is developing a cycleway along the eastern side of Alexandra Canal as rezoning and development occurs. This would complement the Bourke Road cycleway and would link with the Airport Cycleway further to the south along Alexandra Canal.
- Cycleway connections along Bourke Street between Coward and Gardeners Road to connect to Coward Street element of the Airport Cycleway and the City of Sydney's Bourke Road cycleway (Botany Bay City Council). This is being constructed by Botany Bay City Council to Church Street.

Cultural facilities located in proximity to the project include:

- Brethren Church, located around 550 metres to the north of the western surface works.
- Regina Catholic Church, a Baptist Church and a community centre, located between 1.3 kilometres to 1.5 kilometres to the south west of the western surface works.
- Our Lady of Fatima Church, located 300 metres east of the Commercial Road construction compound
- The South-West Chinese Christian Church, located around 300 metres east of the Commercial Road construction compound.
- Uniting Church around 850 metres north west of the Bexley Road North construction compound.
- Uniting Church located around 950 metres to the east of Bexley Road East construction compound.
- Community centre and scout hall around 250 metres to the south-west of the Bexley South construction compound.
- Wolli Creek Islamic Mosque located around 400 metres to the west of the Arncliffe surface works.
- Arncliffe Scots Sports and Social Club around 600 metres to the west of the Arncliffe surface works.
- St Peters Church of England around 150 metres to the west of St Peters interchange.

A list of sport, recreational and cultural facilities identified in proximity to the project are provided in Appendix B and shown in Figure 3 to Figure 6.

**Shopping**

There are a number of major shopping centres in the study area, including Roselands, Westfield Hurstville, Marrickville Metro Shopping Centre and Alexandria Homemaker Centre. Shopping locations that are in the vicinity of the western end of the project include those areas around Kingsgrove Station and Bexley North Station.

King Street in Newtown is known for its unique selection of independent retailers. The southern portion of King Street is in the vicinity of the St Peters interchange and eastern end of the project. In addition, the corner of King Street and Enmore Road in Newtown is the location of the Newtown Community Market, which is open every Saturday.

### 3.1.6 Summary of key findings

The population of the study area is very diverse with varying family, housing, employment and socio-economic factors making up the individual communities within it. Those residents in the southern and western regions of the study area tend to be less mobile, more likely to belong to larger family households, live in standalone houses or dwellings and are more likely to have lower incomes and lower labour force participation. In comparison, residents closer to Sydney CBD tend to be more mobile, live in smaller households of either family or non-family arrangements, are more likely to live in apartments/units/flats, have higher incomes, higher labour force participation and more likely to hold white-collar jobs.

The study area has a wide variety of recreational and community facilities to meet the diverse needs of the study area. Recreational space is of significant importance to the region due to the considerable number of walking and cycling facilities encouraging active living for the community. Sydney Park is of regional importance as it provides both active and passive open space for the utilisation of local sporting and community clubs, thus encouraging community cohesion.

## 3.2 Economic

### 3.2.1 Workforce characteristics

The following indicators provide a profile of individuals that work in businesses located in the study area. The following profile of the study area workforce has been informed by the most recent release of the *Australian Census of Housing and Population,* Working Population Profiles (Australian Bureau of Statistics, 2012).

In 2011, 527,725 people worked in the study area. Of these workers, 75 per cent were employed in Sydney LGA. Businesses within Botany Bay LGA employed the second largest proportion of these workers at 8.5 per cent of the study area workforce.

Workers in Canterbury and Hurstville LGAs were most likely to be employed in Retail Trade (13.6 per cent and 12.9 per cent, respectively) or Health Care/Social Assistance (13.6 per cent and 13.5 per cent, respectively). Workers in Rockdale were most likely to be employed in Retail Trade (14.0 per cent) or Transport/Warehousing (13.5 per cent). Workers in Marrickville were most likely to work in Manufacturing (15.0 per cent) or Retail Trade (11.3 per cent). Around 42 per cent of the workforce of Botany Bay was employed in the Transport/Postal/Warehousing industry. Manufacturing was also common in Botany Bay, employing 11.2 per cent of the workforce. The most common industries for workers in Sydney LGA to be employed in were Financial/Insurance Services or Professional/Scientific/Technical Services (19.7 per cent and 18.6 per cent respectively).

### 3.2.2 Business and industry

In 2012-13, the total study area had an estimated $125.1 billion Gross Regional Product (GRP) (AECOM, 2014) and contributed to 26.3 per cent of the New South Wales Gross State Product (GSP). In 2012-13, Canterbury, Hurstville, Rockdale and Marrickville LGAs were all relatively diverse. The estimated GRPs for these areas were as follows:

- Canterbury LGA had an estimated $4.2 billion GRP with the largest contributing industry being manufacturing, contributing 9.8 per cent of total industry value add;
- Hurstville LGA had an estimated $3.4 billion GRP with the largest contributing industry being financial/insurance services, contributing 13.4 per cent of total industry value add;
- Rockdale LGA had an estimated $3.8 billion GRP with the largest contributing industry being transport/postal/warehousing, contributing 14.6 per cent of total industry value add; and
- Marrickville LGA had an estimated $4.3 billion GRP with the largest contributing industry being manufacturing, contributing 13.1 per cent of total industry value add.

The economies of Botany Bay and Sydney LGAs were not so diverse and were generally reliant on one industry. The estimated GRPs for these areas were as follows:

- Botany Bay LGA had an estimated $7.8 billion GRP with the largest contributing industry being transport/postal/warehousing, contributing 45.4 per cent of total industry value add; and
- Sydney LGA had an estimated $101.6 billion GRP with the largest contributing industry being financial/insurance services, contributing 37.1 per cent of total industry value add.

Businesses in the study area are generally clustered around main transport hubs, such as railway stations, major bus routes or in close proximity to roads connecting with Sydney Airport or Port Botany. At the two ends of the project, clusters of businesses are located at the following locations:

- Kingsgrove Business/Industrial Area (the Crescent, Vanessa Street and Commercial Road) – a cluster of commercial and industrial businesses. Business activity includes warehousing, manufacturing, storage, automotive services, bulk goods and an industrial park;
- Kingsgrove Road (north of the M5 East Motorway) – a cluster of commercial and wholesaling retailers;
- Kingsgrove Road (south of the M5 East Motorway) / Kingsgrove Station – a cluster of retail services, cafes and restaurants, real estate agents, personal services, a supermarket and Kingsgrove Hotel. Businesses are located in a high street setting along Kingsgrove Road and within a shopping centre located near the station;
- Bexley North Station – a cluster of retail services, cafes and restaurants, real estate agents, supermarket and Bexley North Hotel;
- Princes Highway, St Peters and Tempe – a cluster of commercial, retail and industrial businesses, including petrol stations, automotive services, personal services, wholesaling, bulk goods (including IKEA Tempe), fast food restaurants and accommodation services (Hotel Ibis Budget);
- King Street, St Peters and Newtown – a cluster of retail services, cafes and restaurants. King Street is an important regional destination for nightlife and entertainment due to its location adjacent to Enmore Theatre, and the numerous pubs, bars and restaurants located along this strip;
- Mascot/Alexandria (Botany Road and Gardeners Road) - a cluster of commercial, retail and industrial businesses, including manufacturing, warehousing, wholesaling and bulk goods (including Alexandria Homemaker Centre and Bunnings Mascot), cafes and food services, automotive services, Alexandria Industrial Estate and a number of business centres (including Heritage Business Centre on Gardeners Road and Sydney Corporate Park); and
- St Peters and Alexandria (Campbell Street and Euston Road) – a cluster of commercial and industrial businesses, including automotive services, warehousing, manufacturing and Alexandria Landfill and supporting businesses.

A large proportion of businesses in the study area are focused around manufacturing, warehousing and transport industries due to the proximity of Port Botany and Sydney Airport. Areas such as Marrickville, Alexandria, Tempe, Botany and Broadmeadow are characterised by high concentrations of industrial businesses leveraging their proximity to interstate and international port and air transport. In addition, areas along the M5 Motorway corridor (the M5 South West Motorway and M5 East Motorway) such as Kingsgrove, Padstow, Milperra and Moorebank, take advantage of the link the M5 Motorway corridor provides to Sydney Airport and Port Botany.

Tourism in the region is centred around Sydney Airport, which provides access to Sydney and broader NSW for domestic and international travellers. Hotels within the region provide accommodation close to the airport.

### 3.2.3 Freight transport

The M5 Motorway corridor forms part of the National Land Transport Network. The National Land Transport Network is based on national and inter-regional transport corridors including connections through urban areas, links to ports and airports, rail, road and intermodal connections that together are of critical importance to national and regional economic growth, development and connectivity.

The M5 Motorway corridor plays an important role as part of the National Land Transport Network in providing businesses with access to regional, interstate and international markets. The M5 Motorway corridor connects businesses with the M7 West Link, King Georges Road, M4 Western Motorway and M2 Motorway in Sydney, moving freight across Sydney to key markets. In particular, the M5 Motorway provides the main connection for businesses in the south-west of Sydney to interstate and international markets through Port Botany and Sydney Airport. Currently around 30 per cent of vehicles using the M5 Motorway in the morning peak are for work related purposes, increasing to 40 per cent during business hours (Infrastructure NSW, 2012).

In 2011, the NSW Freight and Ports Strategy (Transport for NSW, 2013) reported that approximately 63 per cent of the total freight task in NSW was carried by road. As the population grows, non-containerised freight and commercial trips are also forecast to grow as demand for goods increases. As significant growth in the total freight task is projected over the next 20 years, maintaining an efficient and effective road network is vital to support this growth. The M5 Motorway corridor currently presents a major challenge in that additional capacity is limited during peak periods. The M5 corridor will play a significant role in facilitating these trips as it continues to serve the majority of Sydney's manufacturing, warehousing and logistics industries in the south-west of Sydney.

Congestion on the M5 East Motorway is no longer restricted to peak travel times only, with an estimated 13.3 hours of congestion per day on the eastern portion of the motorway (Infrastructure NSW (citing Ernst and Young), 2012). Sustained congestion increases the time and cost of travel for freight and commercial movements, reduces the efficiency of freight movements and business travel and hinders economic growth. The cost of congestion to the NSW economy in 2011 was estimated at $5.1 billion and is expected to rise to $8.8 billion by 2020 as Sydney's population grows (Transport for NSW, 2012). Efficient freight movements can reduce the cost of congestion, thus reducing the cost of goods and services, which in turn can strengthen NSW export opportunities and generate jobs.

### 3.2.4 Summary of key findings

Businesses located in the study area employ approximately half a million people. In the southern and western regions of the study area, the majority of jobs are in the Retail Trade, Health Care/Social Assistance, Transport/Warehousing and Manufacturing industries. Conversely, Sydney LGA has a greater proportion of people employed in Financial/Insurance Services or Professional/Scientific/Technical Services.

In 2012-13, the total study area had an estimated $125.1 billion Gross Regional Product (GRP). While the majority of LGAs in the study area have relatively diverse economies, Botany Bay LGA is highly reliant on the Transport/Postal/Warehousing industries and Sydney LGA is highly reliant on Financial/Insurance services.

Businesses in the study area are generally clustered around main transport hubs, such as train stations, major bus routes or in close proximity to roads connecting with Sydney Airport or Port Botany. A large proportion of businesses in the study area are focused around manufacturing, warehousing and transport industries due to the proximity of Port Botany and Sydney Airport.

The M5 Motorway plays an important role in providing the main connection for businesses in the south-west of Sydney to interstate and international markets through Port Botany and Sydney Airport. The M5 Motorway is currently a highly congested corridor during peak and non-peak travel times, resulting in reduced freight efficiency and constraining economic growth. As freight tasks grow, the M5 Motorway presents a major challenge in accommodating these additional freight movements, considering the limited capacity currently available on this major freight corridor.

## 3.3 Travel patterns

For a detailed description of travel patterns in the study area see Technical Impact Assessment: Traffic and Transport of the EIS.

### 3.3.1 Road

The study area is characterised by a number of major motorways and arterial roads. The M5 Motorway corridor is a major transport route connecting south-west Sydney with Sydney Airport and Port Botany. A number of major arterial roads provide links with the M5 Motorway corridor including King Georges Road, Bexley Road, Princes Highway, General Holmes Drive, and Southern Cross Drive/Eastern Distributor, which connects the M5 Motorway corridor with the Sydney CBD and Sydney's north.

The extensive road network means that travel by car is common. Car trips (as a driver or passenger) were the most common mode of travel to work in Canterbury (71.8 per cent), Hurstville (67.3 per cent), Rockdale (68.1 per cent), Botany Bay (68.1 per cent) and Marrickville (48.9 per cent) LGAs. Car trips (as a driver or passenger) were the second most common mode of travel in Sydney CBD, behind walking, accounting for 30.4 per cent of total trips to work.

Observations on regional traffic behaviour are provided in Technical Working Paper: Traffic and Transport (AECOM, 2015). In summary:

- West of the M5 East Motorway / Princes Highway interchange, east-west traffic movement is focused on the M5 East Motorway, with Canterbury Road and Illawarra Road to the north, and Stoney Creek Road, Forest Road and the Princes Highway to the south, carrying lower volumes.
- East of the M5 East Motorway / Princes Highway interchange, east-west traffic movement splits fairly equally between the Princes Highway, Marsh Street and the M5 East Motorway. A similar amount of traffic also merges from General Holmes Drive to and from the south.
- North-south traffic is mainly focused on King Georges Road in the west and the Princes Highway in the east. These routes onto the M5 East Motorway provide the dominant approach to Sydney Airport and Port Botany and onwards to Southern Cross Drive for traffic from Sydney's west.

At the western end of the study area, roads such as Moorefields Road, William Street, Vanessa Street and Morgan Street provide connections between key north-south roads (eg Bexley Road) as well as provide access to local destinations adjacent to the Motorway. At the eastern end of the study area around St Peters, a number of roads serve both regional and local functions. This includes:

- Princes Highway – A major state highway that runs from Sydney CBD at Broadway, through Newtown (King Street) and St Peters, and beyond Kogarah. In addition to its regional function, the highway also serves local connections for communities, commercial and industrial precincts located along its length.
- King Street – King Street is a major state road, part of the Princes Highway, which runs through the retail precinct of Newtown. It serves as one of the key connections between the Sydney CBD and areas in the south of Sydney.
- Canal Road / Ricketty Street / Kent Road – These roads provide a link in the state road network, connecting Princes Highway to Gardeners Road, Mascot. The Ricketty Street Bridge presently provides the only crossing of the Alexandra Canal in the area.
- Gardeners Road – Gardeners Road is a state road which runs east-west, connecting Kent Road in the west to Anzac Parade and Bunnerong Road in the east. It provides local access to industrial, commercial and residential uses along its length.
- Burrows Road – Burrows Road is a local road that begins at Huntley Street and end south of Canal Road. It serves the light industrial precinct that runs along its length.

- Campbell Road – Campbell Road is a regional road that runs between Burrows Road and Barwon Park Road. In conjunction with Campbell Street, this road provides access to residential, industrial and open space facilities.
- Campbell Street – Campbell Street is a local road that runs between Barwon Park Road and Unwins Bridge Road. It provides local access for communities and industrial areas north-east of the Princes Highway, as well as through movements originating or travelling to Marrickville and suburbs beyond,
- Euston Road – Euston Road is a collector road. It connects McEvoy Street in the north and Campbell Road in the south. The section between McEvoy Street and Sydney Park Road forms a part of the regional road network to the Eastern Suburbs. From Sydney Park Road to Campbell Road, it serves a light industrial precinct.
- Bourke Road / Bourke Street – Bourke Road is a local road that runs between Botany Road, Waterloo and Gardeners Road, Alexandria. North of Botany Road, it becomes Bourke Street and continues until Campbell Street, Darlinghurst. To the south of Gardeners Road, it becomes Bourke Street through Mascot Town Centre to Coward Street, Mascot, when it then returns to being Bourke Road until O'Riordan Street, Mascot.

### 3.3.2 Public transport

Rail transport was the second most common mode of travel to work in Canterbury (18.4 per cent), Hurstville (25.5 per cent), Rockdale (22.4 per cent) and Marrickville (25.7 per cent) LGAs. Rail travel only accounted for 4.5 per cent of trips to work in Botany Bay LGA, where only Mascot and Sydney Domestic Airport stations are located within the north-west of the LGA.

The study area is serviced by three heavy railway lines:

- The Bankstown Line travelling from the Sydney CBD to Liverpool or Lidcombe via Bankstown;
- The Airport Line travelling from the Sydney CBD to Macarthur via the Airport or Sydenham; and
- The Inner West and South Line travelling from the Sydney CBD to Campbelltown via Granville.

In addition to the train services, there are a number of bus routes travelling to the Sydney CBD, including routes 308, 422 and M20, with a service frequency of between seven minutes and 20 minutes in the AM and PM peaks. Additional bus routes provide access to suburbs, such as Wolli Creak, Bondi Junction, Marrickville and Burwood. These bus routes are less frequent than the bus routes travelling to the Sydney CBD.

Sydney Buses extensive bus network covers a vast portion of the study area.

Bus transport accounted for 11.1 per cent of Marrickville LGA trips, 16.1 per cent of Botany Bay LGA trips and 15.9 per cent of Sydney LGA trips. Bus trips represented only small proportions of trips to work in Canterbury, Hurstville and Rockdale LGAs.

There are no regular bus services on the M5 East Motorway or the M5 South Western Motorway. Intercity coach services, such as those operated by Murrays or Greyhound, use the M5 East Motorway and the M5 South Western Motorway.

The main bus routes servicing the areas around the corridor include:

- 305 (Stamford Plaza Hotel to Railway Square).
- 308 (Marrickville to City).
- 309 (Port Botany to City).
- 310 / X10 (Eastgardens to City).
- 348 (Wolli Creek to Bondi Junction).
- 370 (Leichhardt to Coogee).
- 400 (Burwood to Bondi Junction).
- 410 (Burwood to Bondi Junction).
- 418 (Burwood to Bondi Junction).
- 422 (Kogarah to the City).

- Route 446 (St George Hospital to Roselands).
- Route 450 (Hurstville to Burwood) and Route 452 (Bankstown to Canterbury).
- Route 490 (Drummoyne to Hurstville) and Route 492 (Drummoyne to Roselands).
- Route 491 (Five Dock to Hurstville).
- Route 493 (Rockdale to Roselands).
- Route 495 (Kingsgrove to Bexley North.
- Route M41 (Hurstville to Macquarie Park).
- Route 946 (Hurstville to Bankstown) and Route 942 (Lugarno to Campsie.
- M20 (Gore Hill to Botany Shops via City).

### 3.3.3 Active transport

Walking was the most common mode of travel to work in Sydney CBD, accounting for 30.5 per cent of total trips to work. Walking accounted for 6.9 per cent of trips in Marrickville LGA and 6.5 per cent of trips in Botany Bay LGA. Cycling to work was most popular in Marrickville and Sydney LGAs, accounting for 4.2 per cent and 3.6 per cent of trips, respectively. The remaining LGAs had low proportions of walking and cycling trips.

Walking and cycling trips increase as a proportion of total trips when taking into account all travel (including weekend trips). This is reflective of the numerous recreational walking and cycle paths in the study area.

At the western end of the study area, the shared path along the M5 Linear Park provides a key off-road west-east route for the local community.

At Arncliffe, the Cooks Park Trail connects areas south of the study area, at Kyeemagh to Arncliffe, Wolli Creek and further east to Tempe. Within the study area, the trail is travels through Barton Park and Riverine Park prior to passing under the M5 East Motorway near Eve Street wetland to connect to Marsh Street and Cahill Park.

In the vicinity of the eastern end of the study area, there are a number of recreational facilities, such as Sydney Park, which generate recreational walking and cycling trips in the area. St Peters Station also generates pedestrian movement to and from the station.

Surveys completed by City of Sydney Council between 2010 and 2014 in the St Peters area and surrounds suggests there is an increasing demand of bicycle trips in the area, with an average growth rate of about nine per cent per annum between these years.

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# 4.0 Consultation and community values

The identification of community values aids in the assessment of potential social and economic impacts by providing insight into how the community may perceive these impacts, and assists in the assessment of indirect impacts on community identity, cohesion and sense of place.

A review of community strategic planning documents relevant to each LGA was undertaken to identify values and aspirations specific to each community. A summary of the community identity, values and future aspirations for each LGA within the study area is provided in Table 3.

**Table 3 Community identity, values and aspirations (sourced from respective community strategic planning documents for each LGA)**

| LGA | Community identity | Community values/ aspirations |
|---|---|---|
| Sydney<br><br>(City of Sydney, 2014) | - A city characterised by diverse communities who live, work and visit Sydney<br>- Encompasses major civic functions, government offices, cultural and entertainment assets and transport infrastructure | - Promote an environment of equality for all people<br>- A sustainable city with minimal environmental impact and improved green space and healthy ecosystems<br>- Efficient buildings and transport systems<br>- Global economic orientation<br>- Improved physical connection through walking, cycling, high quality public transport<br>- Improved sense of belonging, contribution and social wellbeing |
| Marrickville<br><br>(Marrickville Council, 2013) | - A diverse, vibrant and innovative community<br>- Diverse age profile, lifestyles and cultural backgrounds<br>- Inner-city living<br>- Strong sense of social justice<br>- Creative community with high participation in arts and cultural activities<br>- Revitalised industrial areas with a focus on high technology, creative and eco business enterprises | - Maintain cultural diversity<br>- Housing affordability<br>- Availability of recreational facilities and open space<br>- Innovative urban planning that protects the character and heritage of the area<br>- Provision of adequate aged care facilities<br>- Adequate health, transport and educational services<br>- Increased availability of quality child care services<br>- Support for disadvantaged community members<br>- Sustainable redevelopment of the Cooks River<br>- Improved community wellbeing and safety |
| Botany Bay<br><br>(Botany Bay City Council, 2015) | - A diverse community that embraces multiculturalism<br>- Inner-city living<br>- Strong sense of local history and culture<br>- Characterised by periods of urban decay and renewal, with historical industrial precincts replaced with new developments over time<br>- Diverse business profile ranging from small home businesses to major multi-national corporations | - Development of a strong sense of community, where everyone feels they belong, are listened to and respected<br>- Clean and inviting streets, which foster improved pedestrian access<br>- Availability and access to transport and community infrastructure<br>- Availability of housing to suit a diverse community<br>- Ongoing economic vitality, with good local jobs based on a diverse economy<br>- Improved amenity of residents, with a move towards safe, clean local industries<br>- Preservation of local history<br>- Improved accessibility to areas of open space, parklands and recreation, including walking and cycling tracks, exercise and sporting facilities to support an active lifestyle<br>- Creation of areas of open space promoting environmental and heritage significance of the area, such as the proposed Botany Wetlands |

| LGA | Community identity | Community values/ aspirations |
|---|---|---|
| Rockdale<br><br>(Rockdale City Council, 2013) | - Cultural diversity<br>- Inner-city living<br>- Connected and engaged community<br>- Highly urbanised with a number of transport connections (rail, road and air)<br>- A mix of residential, industrial and commercial precincts and areas of open space | - Welcoming and creative city with active, healthy and safe communities<br>- High quality natural and built environment and valued heritage in liveable neighbourhoods<br>- A city that is easy to get around with good links and connections to other parts of Sydney and beyond<br>- Thriving economy that provides jobs for local people and opportunities for life long learning |
| Hurstville<br><br>(Hurstville City Council, 2011) | - An evolving city which promotes a sustainable and safe community that connects people and places and celebrates diversity<br>- Acts as a major transport interchange for the St George region with access to road and rail and proximity to Sydney Airport<br>- Hurstville City Centre provides the major concentration of commercial and retail space for the region<br>- Connection to natural environment with proximity to the Botany Bay and Georges River foreshores, as well as one of the largest native bush reserves in the St George region, Oatley Park | - A diverse, harmonious and inclusive city that provides a range of social, cultural, educational and leisure opportunities<br>- Protect and improve the city's natural and built environments and cultural assets for the health, wellbeing and benefit of current and future residents<br>- Increase Hurstville's level of income and capital, and distribute this wealth to the community through local expenditure, services and employment<br>- Improved age care facilities and services<br>- Improved access to public transport<br>- An informed community, with ongoing consultation, particularly around matters of human health and wellbeing |
| Canterbury<br><br>(Canterbury City Council, 2014) | - City of cultural diversity<br>- A built environment that is characterised by a high quantity of older residential areas, with some industrial areas on the city's fringe.<br>- Canterbury Road has been identified as a Potential Enterprise Corridor, which will act as an important centre for local employment | - Increased opportunities and community space for appreciation of local heritage, arts, music and culture<br>- Improved appearance of the city, with cleaner streetscapes, more green space and improved community infrastructure to create a "village feel"<br>- Improved pedestrian and cycling access and adequate parking around shops and public transport<br>- Promotion of healthy lifestyles supported by parks, outdoor recreational facilities and sporting facilities<br>- Improved community safety and wellbeing, with increased access to adequate health services and educational facilities<br>- A prosperous local economy with improved town centres and industrial precincts<br>- Improved awareness and support of protection of the natural environment |

Consultation with key stakeholders has been conducted prior to, and during, the preparation of the EIS for the project. A number of communication and consultation activities were undertaken to inform the design development for the project, the environmental assessment activities and ongoing communications during the preparation of the EIS.

Consultation with government agencies, local councils and the community has been recorded and considered during the preparation of the EIS. Table 4 presents the feedback provided by government agencies, local councils, businesses, industry groups, residents and the community with regard to social and economic issues.

More detail on consultation undertaken to date and planned consultation activities can be found in Chapter 7 of the EIS.

Consultation with residents, businesses and the community would continue throughout the planning, construction and operation of the project.

**Table 4 Feedback provided by stakeholders**

| Issue | Detail |
|---|---|
| **Construction** | |
| Property | Concern about impacts on property values |
| | Concern about damage to properties from vibration during tunnelling and other construction activities |
| | Concern about residential property acquisition |
| | Concern about finding tenants to rent property |
| | Concern about negotiating a property sale following the announcement of the project |
| Accessibility and parking | Concerns about local traffic impacts, particularly congestion and heavy vehicles using local streets during construction |
| | Concern about traffic management during and after construction |
| | Concerns about delays in travelling to the airport |
| | Concern about contractors parking on local streets during construction |
| | Concerns about potential changes to access to the Tallawalla Street underpass and Karingal Street underpass |
| | Concern about a potential loss of pedestrian and cyclist connectivity to Kingsgrove Station |
| | Concern that local streets will be connected directly onto the M5 East Motorway |
| | Concern about induced traffic demand from the New M5 |
| | Concern about safety impacts of additional traffic as there are many pedestrians around the schools, shops and railway stations |
| Amenity | Concern about increased levels of dust during construction |
| | Concern about noise and vibration during construction, particularly during night time construction activities |
| | Concern about the relocation of noise barriers closer to properties and the height and effectiveness of existing noise barriers |
| | Concern about the visual impact due to the loss of noise mounds |

| Issue | Detail |
|---|---|
| Community facilities | Concerns about the loss of green space at the golf course |
| | Concerns about potential impacts on the Wolli Creek bushland |
| | Concerns about the loss of pedestrian and cycle paths |
| | Concern about temporary loss of community facilities such as the grass netball courts at Tallawalla Street Reserve. |
| **Operation** | |
| Property | Concern about impacts on property values |
| | Concern about having a tunnel under people's houses |
| | Concern about the future of construction sites once construction is completed |
| Accessibility and parking | Concern about the implementation of a toll on the New M5 |
| Amenity | Concern for health and air quality impacts of locating ventilation outlets close to homes, schools and other community facilities |
| | Concerns about visual impact of the ventilation outlets near residential properties, schools and other community facilities |
| | Concern about the relocation of noise barriers closer to properties and the removal of existing noise mounds |
| Community facilities | Concerns about the loss of green space |
| | Concerns about the loss of pedestrian and cycle paths |

# 5.0 Impact assessment – Construction

During the construction of the project, there is the potential for positive and negative impacts on residents, businesses, road users (including commercial and freight vehicles), users of community facilities and the wider community. An assessment of the potential impacts has been undertaken to determine the type, direction and magnitude of the potential impacts.

This chapter presents the potential social and economic impacts during the construction of the project. The potential operational impacts are presented in Chapter 6.0.

The following potential impacts during project construction have been identified:

- Amenity and health impacts on road users, businesses and the community arising from increased noise and vibration, decreased air quality and changes to visual amenity.
- Acquisition of residential properties, open space/recreational land and businesses.
- Changes to walking and cycle paths.
- Changes in accessibility to residential properties, community facilities and businesses arising from increased congestion, reductions in car parking availability, rerouting of property access and egress and temporary closure of local roads.
- Changes in business turnover and employment due to construction expenditure, the increased construction workforce, changes in accessibility to businesses and the impact of changes to amenity on business activities.
- Cumulative impacts due to concurrent construction activities associated with other major infrastructure projects in the region.

Further details of construction impacts are presented in the following sections, with potential social and economic impacts discussed separately.

## 5.1 Social

### 5.1.1 Amenity and health

Amenity refers to the quality of a place, its appearance, feel and sound, and the way its community experiences the place. Amenity contributes to a community's identity and its sense of place. Aesthetic qualities are an important part of amenity, but the broader concept of amenity is determined also by the physical design of a place and the human activity that takes place within it. A place that has 'amenity' is regarded as pleasant and attractive, as well as convenient and comfortable (Handy, 2002).

Amenity impacts include any factors that affect the ability of a resident or visitor to enjoy their home and daily activities, for example, noise, vibration, detrimental changes to views or changes to air quality. Changes in amenity may also conflict with community values, contributing to a loss of or change in a community's sense of place, and subsequently a community's perceived identity. Residents or road users could also experience construction fatigue to due consecutive projects occurring in the same area or due to a lengthy construction phase.

Amenity impacts during construction of the project are discussed in detail in Chapter 10 (Air quality), Chapter 11 (Human health), Chapter 12 (Noise and vibration) and Chapter 14 (Landscape character and visual impact) of the environmental assessment.

With reference to those assessments, the potential impact to residents and the community during construction could occur as a result of:

- Increases in noise and vibration associated with construction works, including increases in road traffic from construction vehicles and the construction workforce.
- Increased dust and air emissions associated with surface disturbance and / or the handling, transport and disposal of soil, as well as vehicular emissions from construction vehicles.
- Changes in visual amenity due to the introduction of construction compounds or activities.

The majority of construction activity would occur underground, which would limit the extent of amenity impacts along the corridor. Impacts would mainly arise at the location of surface works, in proximity to construction sites and compounds and along transport routes from the construction traffic.

Amenity impacts to residents and the community are presented in the following sections based on the location of proposed works. For amenity impacts to businesses, see Section 5.2.2.

#### 5.1.1.1 Western and Kingsgrove Road surface works

The **western surface works** include:

- The M5 South West and M5 East Motorway integration works.
- Construction of the western portal of the project.
- The Kingsgrove North construction compound (C1), the Kingsgrove South construction compound (C2) and the Commercial Road construction compound (C3).
- The construction of the Kingsgrove motorway operations complex (MOC1).

Dust emissions can occur during site establishment (eg demolition, earth moving and sinking of shafts) and during construction itself (such as excavation, haulage and road construction), and can vary substantially from day to day depending on the level of activity, the specific operations being undertaken, and the weather conditions. A significant portion of the emissions results from site plant and road vehicles moving over temporary roads and open ground.

Any effects of construction on air quality (and amenity) would generally be temporary and relatively short-lived. In addition, much of the impact from dust emissions can be mitigated through measures routinely employed as good practice on construction sites.

Construction activities associated with the western surface works would have a significant impact on the residential receivers located adjacent or near to the construction site during day and night time periods, which is attributed to the types of construction activities and equipment involved as well as the limited available setback to nearby residential receivers. In particular, the Kingsgrove North construction compound and works associated with the widening of the motorway to accommodate the project would have significant noise impacts on sensitive receivers that are located the closest to these activities. A number of these receivers have been identified as being highly noise affected by noise during construction, which would trigger the need for further consideration for mitigation and management approaches. There is also the potential for activities to exceed sleep disturbance criterion for some residences during certain activities.

A number of schools, community centres and churches located in the vicinity of the construction activity would also have the potential to be impacted by construction noise. This includes Beverly Hills North Public School and the Regina Coeli Catholic School and church. However, the majority of these receivers are not directly adjacent to construction activities and the separation of these receivers to construction activity would minimise the potential impacts.

Residents located at the southern end of Glamis Street and on Armitee Street are expected to be impacted by visual amenity due to the Kingsgrove North construction compound (C1). A temporary noise barrier is proposed along the north and west boundaries of the compound which could be visually intrusive to around 12 residences whose properties back on to the Kingsgrove North construction compound, and who currently enjoy views to the open parkland. Other elements of the construction activity, such as acoustic sheds, may also be visually prominent to residences in the areas north of the Kingsgrove North construction compound. Overshadowing from the larger or closer element to property boundaries may impact residents along Glamis Street. Overall, depending on the location of the residences relative to the construction activity, the visual amenity of residents located in this area are likely to be moderately to highly impacted from the temporary changes to the parkland views. Given that accessibility to parklands and open space is highly valued by the local community, these impacts, while temporary for the duration of construction, may impact upon the affected resident's sense of place. Longer term visual amenity impacts in this location due to the project are considered in Chapter 6.

Pedestrians and cyclists using the M5 Linear Park would be diverted around the northern edge of the Kingsgrove North construction compound between the noise barrier and fences of adjacent residences, whereby the visual experience for these recreational users would be reduced. Cyclists and pedestrians using the paths and parkland around this compound may be subject to increased noise levels during their journey due to construction work occurring at this site. While the opportunity to walk or cycle in this area would be maintained, in line with the local community's values of pedestrian and cycling access, outdoor recreational facilities, and an active lifestyle, the amenity and therefore the positive experience of pedestrians and cyclists would be reduced.

Residents of Glamis Street are expected to be highly affected by night lighting occurring on the site and on the pedestrian pathway located between their properties and the noise barrier.

The Kingsgrove North construction compound (C1) would be visible to users of the Canterbury Golf Course at the south-western corner of the course. The visual amenity of the landscape is important for these receivers as they value the green space of the golf course and the slow speed at which they move through the site could result in a high exposure to visual impacts. However, as only a small portion of the course is impacted by decreased visual amenity, it is not anticipated that this would deter golfers from using the course. Users of the golf course are not expected to be detrimentally impacted by noise during construction works.

The Kingsgrove North construction compound (C1), the Kingsgrove South construction compound (C2) and the Commercial Road construction compound (C3) have been identified as visible to road users from the M5 East Motorway. This impact is expected to be minor as motorists would be travelling quickly past the compounds and the impact would be momentary.

#### 5.1.1.2 Bexley Road surface works

The **Bexley Road surface works** include:

- The Bexley Road North construction compound (C4), the Bexley Road South construction compound (C5) and the Bexley Road East construction compound (C6) during construction.
- The construction of the Bexley Road South motorway operations complex (MOC2).

Dust emissions can occur during site establishment (eg demolition, earth moving and sinking of shafts) and during construction itself (such as haulage and the construction of the motorway operations complex), and can vary substantially from day to day depending on the level of activity, the specific operations being undertaken, and the weather conditions. A significant portion of the emissions results from site plant and road vehicles moving over temporary roads and open ground.

Any effects of construction on air quality (amenity) would be generally temporary and relatively short-lived. In addition, much of the impact from dust emissions can be mitigated through measures routinely employed as good practice on construction sites.

Residents located to the north of the Bexley Road North construction compound (C4) and to the east of the Bexley Road East construction compound (C6) are expected to experience some minor noise exceedances during site establishment works. Residents located in proximity to the Bexley Road South construction compound (C5) are anticipated to be highly affected during night works during the construction of the ventilation stations and surface works. The works that would have the most impact on sensitive receivers would be the site establishment period when the tunnel decline and shaft is excavated. There is also the potential for sensitive receivers to be impacted by road noise generated by construction traffic. Construction activities would also be above criteria for some activities at community facilities located on Shaw Street, Bexley North. Noise amenity may also be impacted at Kingsgrove Avenue Reserve, located to the west of the Bexley Road South construction compound, community facilities located on Shaw Street, Bexley North, and at commercial businesses located near Bexley North railway station. However, the distance to the community facilities and commercial areas from construction activity would limit the impacts at these receivers.

The Bexley Road North construction compound (C4) would be highly visible to adjoining residential development due to the acoustic shed and associated infrastructure. A temporary noise barrier and/or hoarding adjoining the residential development would be provided however, compound infrastructure would remain visible above the barriers. This infrastructure would be visibly intrusive to many residents whose properties back on to the site, and subsequently may reduce their sense of place. Overshadowing from the larger or closer elements to property boundaries may impact residents along Jones Avenue and Flatrock Street. Residents of Bexley Road north of Poole Street are expected to be moderately affected by night lighting occurring on the site.

The Bexley Road South construction compound (C5) would include a noise barrier and hoarding erected around the site and an acoustic shed that would be mostly screened by trees from residences located to the southwest of Wolli Creek. Due to the proposed height of the noise barriers and/or hoarding, the compound would still be visible to these residences but the impact would be moderate due to the distance between the residences and the compound. No overshadowing of residences is anticipated due to infrastructure at this site. Residents are not expected to be affected by night lighting occurring on the site.

The Bexley Road East construction compound (C6) would include a noise barrier along the northern and eastern boundaries of the site adjoining residential properties. This infrastructure would be visibly intrusive to many residents whose properties back on to the site, reducing their sense of place.

The Bexley Road North construction compound (C4), the Bexley Road South construction compound (C5) and the Bexley Road East construction compound (C6) have been identified as visible to road users from the M5 East Motorway ramps and Bexley Road. This impact is expected to be minor as motorists would be travelling quickly past the compounds and the impact would be momentary. Residents that front onto Johnston Street and Wolli Avenue, whose properties sit at a higher level and may have views into the site may see some light spill directly over the noise barriers, depending on the angle of viewing, at night and therefore are expected to be moderately impacted by night lighting.

Pedestrians and cyclists using the M5 Linear Park are likely to be impacted by changes to visual amenity due to Bexley Road North construction compound (C4), the Bexley Road South construction compound (C5) and the Bexley Road East construction compound (C6) during construction. Cyclists and pedestrians using the paths and parkland around this compound may be subject to increased noise levels during their journey due to construction work occurring at this site. While the opportunity to walk or cycle in this area would be maintained, in line with the local community's values of pedestrian and cycling access and an active lifestyle, the amenity and therefore the positive experience of pedestrians and cyclists would be reduced.

#### 5.1.1.3 Arncliffe surface works

The **Arncliffe surface works** include:

- The Arncliffe construction compound (C7).
- The construction of the Arncliffe motorway operations complex (MOC3).

Dust emissions can occur during site establishment (eg demolition, earth moving and sinking of shafts) and during construction itself (such as haulage, stockpiling and the construction of the motorway operations complex), and can vary substantially from day to day depending on the level of activity, the specific operations being undertaken, and the weather conditions. A significant portion of the emissions results from site plant and road vehicles moving over temporary roads and open ground.

Any effects of construction on air quality (and amenity) would be generally temporary and relatively short-lived. In addition, much of the impact from dust emissions can be mitigated through measures routinely employed as good practice on construction sites.

Residents located around Marsh Street and in proximity to the Arncliffe construction compound (C7) would be impacted by construction activity and construction traffic noise. The construction of the motorway operations complex would have the greatest impact on sensitive receivers. Some receivers would be highly noise affected during this construction activity, however, noise impacts would reduce as distance from the motorway operation complex increases.

The Arncliffe construction compound (C7) would be visible to residential properties located on the intersection of Flora and Marsh Streets, Kogarah. These residents are in close proximity to the construction compound site and would have views from their residences change from a view over the golf course to one of noise barriers and hoarding surrounding the construction site. The construction compound would include night lighting for construction activity and these residents may be impacted by lighting and glare at night. These residents would be particularly sensitive to night lighting as the golf course is generally unlit at night. However, lighting would be required to comply with the operational requirements of Sydney Airport.

Pedestrians and cyclists using the Cooks Park Trail would be impacted from construction activity, whereby the visual experience for these recreational users would be reduced. However, it is acknowledged that this trail does pass adjacent to the M5 East Motorway near Marsh Street. Cyclists and pedestrians using the paths and parkland around this compound may be subject to increased noise levels during their journey due to construction work occurring at this site.

The Arncliffe construction compound (C7) would be visible to users of the Kogarah Golf Course. The visual amenity of the landscape is important for these receivers as they value the green space that the golf course provides and the slow speed at which they move through the site would result in a high exposure to visual impacts. Users of the course would be in close proximity to the construction compound. Users of the golf course are anticipated to experience increased noise from activity at the Arncliffe construction compound (C7) and the combined decreased in amenity and change in the course from an 18-hole to a 9-hole course may deter recreational golfers from using the site. This would also impact upon community values as sporting and recreational facilities are highly valued by the local community.

#### 5.1.1.4 St Peters interchange and local road upgrade surface works

The **St Peters interchange and local road upgrade surface works** include:

- The St Peters interchange works.
- The Canal Road construction compound (C8), the Campbell Road construction compound (C9), the Landfill Closure construction compound (C10), the Burrows Road construction compound (C11), the Campbell Road bridge construction compound (C12), the Gardeners Road Bridge construction compound (C13) and the Sydney Park construction compound (C14).
- The construction of the St Peters motorway operations complex and Burrows Road motorway operations complex, including the motorway control centre and maintenance facility and the St Peters interchange ventilation facility.
- Local road upgrade works.

Dust emissions can occur during site establishment (eg demolition, earth moving and sinking of shafts), landfill closure and during construction itself (such as haulage, stockpiling and the construction of the interchange, local road upgrades and motorway operations complexes), and can vary substantially from day to day depending on the level of activity, the specific operations being undertaken, and the weather conditions. A significant portion of the emissions results from site plant and road vehicles moving over temporary roads and open ground.

Any effects of construction on air quality (and amenity) would be generally temporary and relatively short-lived. In addition, much of the impact from dust emissions can be mitigated through measures routinely employed as good practice on construction sites.

Residents located along local roads, including residents located along Campbell Street/Campbell Road, Church Street and residents located around the northern ends of St Peters Street, Florence Street, Brown Street and Unwins Bridge Road are expected to be highly affected by increased noise levels during the local road upgrade works. In addition, St Peters Public School, located on Church Street and St Peters Anglican Church are expected to be highly affected by noise during surface works.

The Campbell Road construction compound (C9) would be visible to residential receivers on Campbell Road. These residents would be affected by the change in character of the view to Campbell Road, whereby the construction compound and noise walls would be visible from dwellings due to the demolition of existing industrial buildings and mature street trees that currently provide a visual buffer. In addition, these residents would experience a cumulative impact associated with the widening of Campbell Road and the associated visual impact of construction works. These residents may also be affected by lighting of the construction compound at night.

The Sydney Park construction compound (C14) would be visible to residential receivers on Campbell Road. The view for these residences would change from one of Sydney Park and its vegetation to a view of the construction compound. This change in visual amenity would impact upon community values including the accessibility and preservation of parks and open space, and may result in a reduced sense of place for affected residents. The oblique viewing angle and screening vegetation would minimise the visual impact for these residents. However, construction activity associated with the widening of Campbell Road would be seen from these residences.

Residents located along Barwon Park Road are expected to have their view altered from one of Sydney Park and its vegetation to a view of the construction compound. This constitutes a significant change in character of the view from this location, impacting on resident's sense of place and identity as parks and open space are highly valued. Residents of Barwon Park Road in close proximity to the Sydney Park construction compound (C14) may be affected by night lighting at the compound, particularly for residential apartments on upper floors of the apartment block. These receivers may get views into the compound from above.

Active and passive recreational users of Sydney Park are likely to be affected by the Sydney Park construction compound located on parkland. This would change the character of the park with construction compound and noise barriers being visible from some areas of the park. Park views to compounds would be screened by land form and vegetation, however, in conjunction with other construction activity, such as the construction of the pedestrian overpass and widening of Campbell Road and Euston Road, users of Sydney Park may be highly affected by changes in visual amenity. In particular, the widening of Euston Road would change the character of the edge of Sydney Park, and a number of entrances to the park lie along Euston Road. As Sydney Park is a highly valued green space within the local community, used by a number of people for various sporting, recreational, pedestrian and cycling activities, these impacts may negatively affect the park user's sense of place and the perceived identity of the surrounding community. However, as much of Sydney Park has a visually inward focus, with landform and planting encouraging inward looking views towards focal points such as wetlands and a playground, or blocking views to the surrounding streets altogether. As such, visual amenity impacts would be limited to areas where direct impacts would occur with the majority of the park unaffected. Users of Sydney Park are likely to be impacted by noise levels of construction works when in close proximity to construction compounds or construction works. Due to the size of the park, the majority of the park (and therefore users of the park) would not be impacted by noisy construction activity.

No visual impacts were identified for residents in proximity to the Canal Road construction compound (C8), Burrows Road construction compound (C10), Burrows Road Bridge compound (C11) and Gardeners Bridge compound (C12).

Construction activities in this area would increase traffic on local and regional roads, and would generate Pedestrians and cyclists using roads that are subject to upgrades or would carry construction traffic would also experience reduced amenity due to construction noise, dust and visual impacts.

#### 5.1.1.5 General amenity and health impacts

An assessment of vibration potentially caused by tunnelling during construction works determined that some exceedances above the preferred criteria would be experienced at night. Vibration associated with tunnelling works is a key concern of the local community, particularly in terms of damage to property and perceived impacts on property value. However, no sensitive receivers would experience vibration levels above the maximum criteria. Vibration levels anticipated during construction of the project, including tunnelling and blasting works, are not expected to reach levels that would cause property damage. However, a property condition report would be completed for properties located within 50 metres of construction activity at the surface or above the tunnels. Additional mitigation and management measures have also been proposed and are detailed in Technical Working Paper: Noise and vibration.

Sensitive receivers may also be impacted by ground borne noise, with predicted noise levels above the criteria for evening and night time periods. It is likely that ground-borne noise would be discernible for up to five days at each affected receiver with exceedances occurring for up to two days. Tunnelling advance rates would reduce to two to five metres a day around the portals, which may increase the duration of exposure for receivers in these areas. As tunnelling moves towards and away from each receiver the noise levels experienced would be lower.

Mitigation measures are required to be implemented throughout the construction period to address potential noise and vibration impacts associated with a range of construction activities and to minimise the potential for adverse health effects in the community. These management and mitigation measures (including the requirement for noise monitoring) are outlined in detail within Technical Working Paper: Noise and vibration (AECOM, 2015).

The main air quality and amenity issues during construction would be:

- Annoyance due to dust deposition (soiling of surfaces) and visible dust plumes.
- Elevated particulate ($PM_{10}$) concentrations due to dust-generating activities.
- Exhaust emissions from diesel-powered construction equipment.

The greatest source of potential dust emissions would be associated with earthworks at the surface, landfill closure works and tunnel excavation.

There is the risk that nearby residences, commercial buildings, hotel, cafés and schools in the immediate vicinity of the construction zone, might experience some occasional dust impacts. This does not imply that impacts are likely, or that if they did occur, that they would be frequent or persistent. Overall construction dust is unlikely to represent a serious ongoing problem. Any effects would be temporary and relatively short-lived, and would only arise during dry weather with the wind blowing towards a receiver, at a time when dust is being generated and mitigation measures are not being fully effective. The likely scale of this would not normally be considered sufficient to change the conclusion that with mitigation the effects would be 'not significant'.

There are unlikely to be any construction projects of this magnitude occurring concurrently with this project in the immediate vicinity. As such, cumulative impacts due to dust from construction are unlikely.

A detailed assessment of air quality is provided in the Technical Working Paper: Air quality (Pacific Environment, 2015) in Appendix H of the EIS.

### 5.1.2 Acquisition of property

The project requires the acquisition of land currently used for residential, business or community/recreational purposes. The project has been designed to minimise the need for land acquisition, where practical, and to limit the severance and sterilisation of private properties. Properties impacted by the project by partial or full acquisition would include land that is subject to strata subdivision or may contain multiple leased industrial units in one property. For the purposes of this assessment, strata titles and/or multiple industrial units have been considered as one property.

The surface works for the project would impact 159 residential, commercial, industrial or recreational properties. Of the 159 properties, 50 properties impacted by the project are owned by Roads and Maritime (41) or other NSW Government agencies (nine).

Of the 159 properties impacted by the project, 109 properties would be fully or partially acquired, or would be temporary occupied by the project:

- 26 properties are owned by local government.
- 78 properties are privately owned.
- Five properties are owned by utility providers.

The complete list of properties acquired for the project is identified in Appendix D (Properties affected by acquisition) of the EIS.

Of the 159 properties impacted by the project:

- A total of 47 industrial and commercial (including Kogarah and Canterbury golf courses) properties would be impacted by the project by full or partial acquisition, or temporary occupation. Of the 47 properties, 18 are already owned by Roads and Maritime or other NSW Government agencies (for example, Alexandria Landfill). Of the 18 properties owned by NSW Government or other NSW Government agencies, some are not occupied or have recently been vacated.
- A total of 69 are residential properties, of which 21 are owned by Roads and Maritime. All residential properties would be subject to full acquisition and in most instances, these properties do contain residences. The exception is the partial acquisition of three private properties that has been zoned for road purposes located between residential apartments and current alignment of Euston Road.
- Additional properties include those that are vacant, within a road reserve, or contain existing roads, such as the M5 East Motorway and properties along the Princes Highway. These are within the ownership of Roads and Maritime or other NSW Government agencies.
- Four public recreational facilities (M5 Linear Park, Sydney Park, May Street Reserve and Camdenville Park).

For public recreational facilities that would be partially or fully impacted by acquisition or temporary occupation is as follows:

- M5 Linear Park. The majority of the park is owned by Roads and Maritime as it comprises a shared path adjacent to the M5 East Motorway. Some areas of the park are owned by Canterbury City Council and would be acquired or temporary occupied for the project. The majority of the park is zoned for Special Infrastructure under the relevant LEP. Around 10.7 hectares of the M5 Linear Park would be permanently impacted by the project with around 2.6 hectares of M5 Linear Park land temporarily occupied during construction. Land temporarily required for construction would be returned to recreational purposes following the completion of construction.
- Sydney Park.
    - Around 2,170 square metres (around 0.2 hectares) of City of Sydney land adjacent to the road corridor within Sydney Park would be acquired. This represents around 0.56 per cent of the total area of Sydney Park.
    - An additional 5,516 square metres (around 0.55 hectares) would be leased or temporarily occupied for construction purposes from City of Sydney and returned to recreational uses following the completion of construction.
    - Around 146 square metres (around 0.015 hectares) of Sydney Water land adjacent to the road reserve within Sydney Park would be acquired.
- May Street Reserve. This would be partially impacted by the upgrade of Campbell Street and the intersection of Unwins Bridge Road/Campbell Street/May Street/Bedwin Road. Part of the park is owned by Roads and Maritime with around 150 square metres owned by Marrickville Council that would be acquired. Around 634 square metres of land not required for the project would be landscaped to reconfigure the May Street Reserve. Additional areas along Campbell Street, not required for road infrastructure, would also be landscaped to provide around 427 square metres of additional open space.
- Camdenville Park. Around 1.1 hectares of Camdenville Park would be impacted as a result of the widened road and works to upgrade the existing drainage basin. The park is owned by Marrickville Council. Land not required for road infrastructure (around 0.86 hectares) would be temporarily occupied from Marrickville Council.

The acquisition of the properties would occur under the terms of *Land Acquisition (Just Terms Compensation) Act 1991* (NSW) and under the Roads and Maritime Land Acquisition Information Guide (Roads and Maritime, 2012), whereby a number of matters are considered when assessing compensation, including:

- The market value of the property
- Any special value or financial value of any advantage, in addition to market value
- Severance or the amount of any reduction in the market value of any other severed land of the person entitled to compensation
- Disturbance, including legal costs, valuation fees, relocation costs, stamp duty costs, mortgage discharge and execution fees or other financial costs reasonably incurred
- Solatium or financial compensation to a person for non-financial disadvantage resulting from the necessity of the person to relocate his/her principal place of residence as a result of acquisition
- Any increase or decrease in the value of adjoining or severed land (by reason of the road proposals).

Ongoing consultation with residents and communities that may be affected by the project assists in reducing uncertainty by providing relevant information about the project and an opportunity to become aware of, suggest improvements to, and adjust to the changes.

Where land affected by construction is not required for the ongoing operation of the New M5, it would be rehabilitated and likely made available for potential sale and/ or redevelopment for a permissible use. The key exception would be where land used for construction purposes is used for one of the four motorway operations complexes. In some cases, including the Landfill closure construction compound site and the surplus land around the St Peters interchange, there may be an opportunity to review the current land use zoning of the affected land. The relevant local council would be consulted in these areas to determine whether current land use zonings and permissible land use types remain appropriate following construction of the New M5.

### 5.1.3 Recreational and community facilities impacts

Community facilities used for recreation have a role in promoting cohesion and interaction among community members and are therefore important social assets. Consultation with stakeholders, discussed in Chapter 4.0, highlights the community's value of parks and open space within the study area and the sporting, recreational, pedestrian and cycling activities that these areas accommodate.

Recreational and community facilities that have been identified as being partially impacted during the construction of the project include:

- The M5 Linear Park.
- Canterbury Golf Course.
- Kogarah Golf Course.
- Sydney Park.
- May Street Reserve.
- Camdenville Park.

The M5 Linear Park would be impacted by the project by during construction. Some parts of the park would be temporarily occupied for construction activities, and some sections would be acquired permanently. The latter would include the widening of the M5 East Motorway to accommodate the project, as well as the construction of the Kingsgrove and Bexley South motorway operations complexes. The land impacted is currently used for walking and cycle paths, particularly for access to rail services at Kingsgrove Station, and as passive open space. While the opportunity to walk or cycle in this area would be maintained, and other areas of open space are available nearby, in line with the local community's values of pedestrian and cycling access and an active lifestyle, the amenity and therefore the positive experience of pedestrians and cyclists would be reduced. The Kingsgrove construction compounds would predominantly occupy Beverly Grove Park, north and south of the existing M5 East Motorway. This would not be available during construction for open space, and upon completion, the available open space would be reduced (this permanent impact is discussed further in Section 6.1.2). The temporary occupation of the M5 Linear Park would occur for the full duration of the construction period for the project (around three and a half years). As parks and open space are highly valued by the local community, the perceived impact of the acquisition of part of Beverly Grove Park is likely to be moderate to high. Impacts to walking and cycle paths in this location are presented in Section 5.1.4.

The partial acquisition and/or temporary occupation of areas owned by Canterbury Golf Course comprises of a mix of vegetation as well as the shared path that forms part of the M5 Linear Park. This would not impact fairways and would not significantly impact the values or function of this private recreational area.

The Kogarah Golf Course would be partially temporarily occupied during construction with a portion of the site acquired for permanent operational facilities. Construction activities would result would reduce the site from an 18-hole course to a nine hole course. The impacts on the golf course are discussed further in Section 5.2.3. Impacts to the golf course would occur for the full duration of the construction for the project.

Areas of temporary occupation during construction Sydney Park would be required for the project, in addition to a small area that would be permanently acquired for road widening. The majority of temporary occupation would occur adjacent to Campbell Road to facilitate the construction of the Campbell Road pedestrian and cyclist bridge and the associated Sydney Park construction compound. Strip acquisition would be required along Euston Road and areas in the vicinity of the Campbell Road and Sydney Park Road intersections with Euston Road. Impacts to Sydney Park are limited to the perimeter of the park and the remainder of the park would remain open to users during the construction period for recreational and sporting activities, such as those identified in Section 3.1.5. The construction works are therefore unlikely to impact on the community's use of the park. In particular, construction activities at the Sydney Park construction compound and associated bridge works would have a limited duration (of around 12 months) when compared to the total construction program.

At the completion of project construction, any land that forms part of Sydney Park that is temporarily occupied during the construction of the project would be rehabilitated and returned to its original use. Recreational users of Sydney Park are likely to experience amenity impacts when in proximity to construction activities that would occur along the periphery of the park and construction would impact on available parking along Campbell and Euston Road. As Sydney Park is a highly valued green space within the local community, used by a number of people for various sporting, recreational, pedestrian and cycling activities, these impacts may negatively affect the park user's sense of place and the perceived identity of the surrounding community. However, construction activities would not significantly impact large sections of Sydney Park and as such, the impacts would not be significant. Impacts to walking and cycle paths within the park are not anticipated during construction of the project.

May Street Reserve is a small pocket park that would be impacted directly for the project due to the works associated with the intersection upgrade. The park largely serves as a landscaped rest area and would not be available for use during construction. Land not permanently required for the project would be landscaped following the completion of construction and reconfigured to incorporate adjoining land that is not required for the project, would also be landscaped.

An area of Camdenville Park would be temporarily occupied during construction due to works to works at the existing stormwater drainage basin. The majority of this area is currently fenced and public access is excluded. The impacts to the park by the project would be temporary and the basin works proposed in this area are consistent with the current land use. Small areas along its western boundary would be permanently acquired as a result of the intersection works, however, this would not have an impact on the recreational values of this open space.

Other areas of parkland and open space in the nearby area provide similar recreational and sporting facilities, as well as pedestrian and cycle paths. These areas are not part of the project and would provide alternatives to the recreational areas impacted above. These alternate areas are identified in Section 3.1.5.

Potential amenity and accessibility impacts on community facilities are presented in Sections 5.1.1 and 5.1.4.

### 5.1.4 Changes to accessibility

Construction of the project has the potential to result in impacts to the local traffic network associated with the establishment of traffic management measures, the introduction of spoil haulage and other heavy vehicles and physical alterations to local roads. This may reduce the performance of the road network. To minimise impacts, construction compound haulage routes have been selected to minimise the use of major roads and movements during peak periods would be minimised where possible.

The following changes in access to residential properties and community facilities may occur during the construction of the project:

- Alternative or reduced access to residential properties, St Peters Public School and community facilities, including reduced or alternative car parking arrangements. This includes temporary closures or restricted access to roads that intersect with Campbell Road and Campbell Street.
- Temporary closure of local roads.
- Relocation of bus stops to accommodate construction activity.
- Diversion or temporary loss of walking and cycle paths.
- Increased congestion and increased travel times.

These potential impacts are discussed further in the following sections. Further details on potential impacts to public transport during the construction of the project are presented in Technical Working Paper: Traffic and transport.

Potential impacts to businesses due to changes in accessibility are presented in Section 5.2.4.

#### 5.1.4.1 Congestion

During construction of the project, additional traffic would be added to the road network including heavy vehicles used in construction support activities, such as haulage of spoil, construction-related light vehicles and light vehicles associated with workforce movements. This has the potential to impact on the ability for residents and the community to access their homes and community facilities in the local area, which is identified as a key concern for community members in Chapter 4.0. Increased congestion could also impact on the community's ability to access the M5 East Motorway and the wider road network, including access to the Sydney Airport, which was also raised as a community concern in Chapter 4.0.

However, to minimise impacts, the project has been designed and planned in order to avoid and minimise impacts to traffic during construction by locating construction compounds which provide tunnelling support adjacent to State and National roads to minimise impacts on the local road network

As the construction traffic volumes are expected to be relatively low when compared to background traffic volumes on major roads surrounding the project, significant increases in congestion along major roads are not anticipated. Some minor increases in congestion may be experienced on local roads in proximity to haulage routes and around construction compounds and surface works is not anticipated to be significant.

Increases in traffic volumes could result in reduced roadside safety, particularly in areas of high pedestrian and cycling traffic such as near schools, child care centres, aged care facilities and near bus stops. This has the potential to impact on the community's perceived sense of safety and wellbeing. Construction traffic would be required to comply with all speed limits, including school zone and construction zone speed limits and a Construction Traffic and Access Management Plan (CTAMP) would be prepared as part of the construction environmental management plan (CEMP) and would consider traffic management arrangements, including speed restrictions on transport corridors, where reasonable and feasible.

Potential impacts to businesses due to congestion are presented in Section 5.2.4.

Further information on construction impacts due to construction traffic can be found in Technical Working Paper: Traffic and transport.

#### 5.1.4.2 Parking and access

Construction works may necessitate physical alterations to private property access or the provision of a temporary alternative access during construction of the project.

The project has been designed to minimise impacts to property access. It is not anticipated that access to existing residential properties or community facilities, including access to Kogarah Golf Course, Sydney Park and local schools, would be impacted by the project. Construction traffic is not expected to affect existing residential property or community facility access, except where delays may occur when exiting from private property or community facilities due to increases in traffic volumes. In the event that changes to access are avoidable, consultation would be undertaken with the property owner and / or tenant to develop an appropriate alternative access arrangement.

It is anticipated that due to the extensive use of Campbell Road, Canal Road and Burrows Road to facilitate the construction activities, motorists would experience an increase in delays when exiting the existing properties along these roads affected by the construction vehicle routes. As residential properties and community facilities are limited in this area, this impact is not expected to be significant for the community or impact their connection or access to these facilities. Some temporary disruption for access to St Peters Public School may be experienced as road works would be undertaken along Campbell Street and St Peters Street, however these impacts would be temporary for the duration of the works and access to the school (and residences) would be maintained.

On-site light vehicle parking would be provided for construction compounds to minimise potential impacts on residents due to parking of the construction workers on local streets and reducing the availability of on-street parking on the local roads. This is a key point of concern for the local community, as identified through community feedback provided in Chapter 4.0. On-street parking would be discouraged, which would be regularly reinforced through project inductions and toolbox talks.

Construction personnel would be encouraged to use public transport where possible, and consider other modes of transport such as carpooling. To accommodate the large labour force anticipated on the project a temporary bus service is proposed in the industrial area to the north of Kingsgrove construction compound and western surface works. This service is anticipated to be needed for the works at the western surface works, with large labour numbers required for both the tunnel and surface works. The shuttle bus would collect workers from the stations and transport them to the Kingsgrove North construction compound.

As there is currently no on-street parking along Marsh Street, Wickham Street, West Botany Street and Princes Highway in the vicinity of the Arncliffe construction compound, no parking impacts are anticipated for local residents in this area.

On-street parking along roads in St Peters and Mascot would be permanently and/or temporarily impacted due to the local road upgrade works. As most of these reductions would occur in areas adjoining commercial and industrial areas.this would minimise the extent of disruption to the community. The indicative impact on on-street and off-street parking is shown in Table 5. The final numbers would be confirmed during detailed design, and in most instances would be a permanent loss.

**Table 5 Temporary indicative impact on parking during construction**

| Road section | Indicative impact |
|---|---|
| Albert Street | Loss of 44 on-street spaces along both sides |
| Campbell Road, between Barwon Park Road and Burrows Road | Loss of 111 spaces along both sides |
| Euston Road, between Campbell Road and Sydney Park Road | Loss of 112 spaces along both sides |
| Burrows Road, south-west of Campbell Road | Loss of 38 spaces along both sides |
| Burrows Road, north-east of Campbell Road | Loss of 23 spaces along both sides |
| Euston Road, north of Sydney Park Road intersection | Loss of 24 spaces along both sides |
| Huntley Street, east of Euston Road | Loss of 32 spaces along both sides |
| Barwon Park Road, north of Campbell Road | Loss of six spaces |
| Princes Highway | Loss of 30 spaces along both sides |
| May Street | Loss of 50 spaces along both sides |
| Unwins Bridge Road | Loss of 39 spaces along both sides |
| Brown Street | Possible loss of up to 16 spaces during integration / tie-in works |
| Florence Street | Possible loss of up to 16 spaces during integration / tie-in works |
| St Peters Street | Possible loss of up to 12 spaces during integration / tie-in works |
| Hutchison Street | Possible loss of up to 10 spaces during integration / tie-in works |
| Gardeners Road, west of Bourke Street | Loss of 10 spaces |
| Gardeners Road, between Kent Road and cul-de-sac of Gardeners Road | Loss of 47 on-street spaces and 20 off-street spaces |
| Bunnings Mascot | Loss of 25 off-street spaces |
| Bourke Road, north of Bourke Street / Gardeners Road intersection | Loss of 26 off-street spaces |

Access and parking impacts to local businesses are discussed in Section 5.2.4.

#### 5.1.4.3 Public transport

During the construction of the project, rail services in the project corridor and surrounding areas are not expected to be affected by the project. However, longer travel times to and from rail stations by supplementary travel modes, such as travel by car, bus or walking may be experienced due to an increase in traffic volumes, slower travel speeds and increased intersection delays.

The M5 East Motorway does not have regular bus services operating on it. However, increases in traffic flows on the existing road network around the western surface works, Kingsgrove Road surface works and Bexley Road surface works areas, may result in some minor delays to bus services at intersections and roads used by construction vehicles. Bus services near the Arncliffe construction compound, the St Peters interchange construction compounds and the local road upgrades are likely to experience increases in travel times due to slower travel speeds and increased intersection delays from increased construction traffic. To accommodate the construction of the project, bus stops would be temporarily relocated as part of local road upgrades at St Peters and Mascot. Where bus stops are temporarily relocated, pedestrian access, including disabled facilities would be maintained. There are no planned road closures along any bus routes during construction and consultation with public transport services would occur on a regular basis to inform the construction staging and progress of works. Pedestrian and cycling access to Kingsgrove Station would be maintained via the M5 Linear Park, although changes to the route and amenity of the park during construction would be required.

For further details on impacts to public transport during construction of the project, see Technical Working Paper: Traffic and transport.

#### 5.1.4.4 Walking and cycling

The project would necessitate alterations to cyclist and pedestrian facilities throughout the construction period. Access to pedestrian and cycle paths, and the active lifestyle associated with use of these facilities, is highly valued by the local community. On road cyclists would experience increased delays at intersections due to an increase in traffic volumes travelling along the corridor and increased journey times due to closed shoulders and detours.

The Kingsgrove North and South construction compound would predominantly occupy Beverly Grove Park, north and south of the existing M5 East Motorway. Pedestrian and cycle paths running through this park would be diverted during the site establishment phase to run outside the construction footprint along the boundary of the Kingsgrove North construction compound, while still remaining within the park. The shared path located to the south of the motorway would be closed during construction, and pedestrians and cyclists diverted to the northern path via the existing pedestrian and cyclists underpass near Tallawalla Street (referred to as the Kindilan underpass).

The project would widened and extend the Kindilan underpass to accommodate the widened motorway. The underpass would also be used during construction to connect the construction compounds located on either side of the motorway. To enable this, the underpass would be temporarily closed for a short duration and opened for a dual function for pedestrians, cyclists and construction vehicles. While the opportunity to walk or cycle in this area would be maintained, the amenity and therefore the positive experience of pedestrians and cyclists would be reduced.

As part of the current Marsh Street widening project being undertaken by Roads and Maritime, a cycle path is to be constructed on the southern side of Marsh Street. A pedestrian crossing facility is also proposed to be added to the western leg of the Marsh Street / Flora Street intersection as part of the same project and it is assumed to be implemented after the construction period. The additional access to pedestrian and cycle paths in this area is likely to be viewed as a positive impact, in line with community values identified in Chapter 4.0.

Some existing pedestrian and cyclist facilities would be temporarily or permanently diverted or realigned to facilitate construction of the St Peters interchange and local road upgrades. While the opportunity to walk or cycle in this area would be maintained, in line with the local community's values of pedestrian and cycling access and an active lifestyle, the amenity and therefore the positive experience of pedestrians and cyclists would be reduced.

Cyclist and pedestrian facilities modified during construction of the project are as follows:

- The southern end of Bourke Road cycle path would be temporarily diverted around the construction works due to space constraints.
- Pedestrian and shared path facilities within areas subject to local roads upgrades would be relocated or temporary access paths would be constructed to maintain access throughout construction.
- Concrete barriers would be installed to separate pedestrians and cyclists from members of the public where a haul road is close to a pedestrian access.
- Along Campbell Road / Campbell Street, Euston Road, Bourke Road, Bourke Street, Gardeners Road and Princes Highway (where it intersects with Campbell Street), the footpath would be affected due to the varied and periodic footpath closures and deviations for road widening. Pedestrians would be diverted to an alternative route or alignment.

Community consultation would occur on a regular basis to inform member of the public of construction staging and progress of works, including any planed road, footpath or cycle path closures or diversions. A strategy for the maintenance of pedestrian and cyclist access throughout construction would be provided as part of the Construction Traffic Management Plan for the project which would be prepared during detailed design.

## 5.2 Economic

### 5.2.1 Changes to business turnover and employment

The construction expenditure of the project would be of significant benefit to the economy. This expenditure would inject economic stimulus benefits into the local, regional and state economies. Ongoing or improved economic vitality is identified as a key value for the study area, particularly for the local communities of Rockdale, Hurstville and Canterbury LGAs (refer Chapter 4.0). Local businesses would principally benefit from this expenditure through purchases made by construction businesses and associated workers to build and support the development of the project. This assessment assumes that 10 per cent of labour, plant and equipment, materials and other inputs being sourced from interstate or overseas, based on similar projects within NSW.

Two types of impacts occur from construction expenditure:

- Direct impacts (including employment), consisting of:
    - 'initial' effects - referring to the impacts arising from the direct employment or expenditure used in the construction of the project
    - 'first-round' effects - referring to the impacts on businesses supplying directly to the construction of the project.
- Indirect impacts referring to 'flow-on' effects to the wider state economy, such as increased expenditure and employment within industries that supply to businesses that directly supply the project with goods or services.

Businesses that may directly benefit from construction of the project may include local construction contractors and those businesses who service or supply goods to the construction industry such as food and beverage retailers, accommodation providers, and other retail outlets that would cater to the day-to-day needs of the construction workforce. The increase in turnover may subsequently lead to increased employment opportunities and incomes for those businesses (and employees) providing goods and services.

On average 1,250 jobs per year are expected to be created over the 42 month construction period (classified as ‘initial’ employment in this assessment). There may be employment opportunities for local residents as part of the construction workforce. As a result, the overall wealth and/or disposable income of the community are expected to grow. Wages may also have the potential to increase due to the increase in demand for construction workers associated with this and other major transport infrastructure projects proposed in Sydney such as the M4 Widening, M4 East, NorthConnex, North West Rail Link, Sydney Metro and Western Sydney Airport.

The assessment of direct, indirect and total impacts of construction expenditure has been conducted using the economic multiplier methodology presented in Section 2.1. Table 6 presents the direct, indirect and total impacts of construction expenditure to the New South Wales economy per year of construction.

Table 6 shows that for New South Wales:

- Direct construction expenditure, in terms of output, contributes an estimated $1.3 billion, on average, per year of construction, with indirect (flow-on) effects of $0.5 billion per year, giving an estimated total impact of $1.8 billion on average per year of construction
- Direct household income generated by the construction of the project is estimated to be $280 million, on average per year of construction, with indirect (flow-on) effects of $120 million per year, giving an estimated total household income contribution of $400 million on average per year of construction
- Direct employment (initial and 'first-round') supported by the construction of the project is estimated to average 2,840 FTE positions per year, giving a total of 7,700 annual FTE positions for the 42 month construction period
- Indirect (flow-on) employment is estimated to average 1,550 FTE positions per year, giving a total of around 9,300 annual FTE positions for the 42 months construction period
- Total employment supported by the construction of the project is estimated to average 4,390 FTE positions per year, giving a total of 26,360 annual FTE positions for the 42 month construction period
- Direct value added attributable to the construction of the project is estimated to be around $460 million on average per average year of construction, with indirect (flow-on) effects of around $210 million per year, giving an estimated total value added contribution of $670 million on average per year of construction. This is the estimated contribution to Gross State Product (GSP).

**Table 6 Direct, indirect and total impacts of construction expenditure on the New South Wales economy per year of construction**

| Impact | Increase in industry output | Increase in household income | Increase in employment | Increase in value added |
|---|---|---|---|---|
| | $ million (2015 prices) | $ million (2015 prices) | Full-time equivalent positions[(a)] | $ million (2015 prices) |
| Direct | 1,280 | 280 | 2,840 | 460 |
| Indirect | 490 | 120 | 1,550 | 210 |
| **Total[(b)]** | 1,770 | 400 | 4,390 | 670 |

**Source: AECOM (2015)**

**Notes:**

(a) Average number of FTE positions supported for the 42 month construction period

(b) Totals may not sum due to rounding

### 5.2.2 Amenity (business)

Amenity has an impact on a customer's decision on where to shop. The impact of amenity on a business could potentially result in loss of trade as customers shop elsewhere to avoid adverse conditions. Amenity impacts include any factors that affect the ability of customers, employees or business owners to enjoy their workplace and daily activities such as noise, vibration, detrimental changes to views or changes to air quality.

Amenity impacts during construction of the project are discussed in detail in Chapter 10 (Air quality), Chapter 11 (Human health), Chapter 12 (Noise and vibration) and Chapter 14 (Visual impact and urban design) of the EIS.

With reference to those assessments, the potential impact to businesses during construction within the study area as a result of changes in amenity would occur as a result of:

- Increases in noise and vibration, including increases in road traffic noise.
- Potential changes in local air quality due to increased dust emissions associated with surface disturbance and/or the handling, transport and disposal of spoil.
- Changes in visual amenity due to construction compounds or activities close to businesses.

The magnitude of the impact of amenity would be largely influenced by the construction hours, length of the construction period, the construction activity, proximity to the project and the nature of the business. As the majority of businesses in close proximity to construction compounds are industrial and commercial businesses, the impact of noise, vibration, air quality and visual amenity are limited. These businesses are not considered sensitive receivers as their business activities are not dependent on amenity. Due to the activities that generally take place in these types of businesses, the working environments generally have low amenity, and, as such, impacts to employees is expected to be marginal.

A number of cafes and food venders are located within these industrial parks, in close proximity to the project. As these businesses generally serve the local workforce, it is not anticipated that amenity would impact the customer's decision to shop at these businesses.

Outside of commercial and industrial zoned land, Kogarah Golf Course has been identified as being impacted by amenity during construction of the project. The Kogarah Golf Course is a private golf course with club facilities. The golf course is reliant on amenity to attract members and visitors. It is anticipated that the golf course would experience increased noise and vibration, decreased air quality and reduced visual amenity. However, given the distance to the club, these impacts would most likely affect users of the course as they move close to construction areas. Due to the expected changes in amenity, the Kogarah Golf Course may be impacted. This is discussed further in Section 5.2.3.

### 5.2.3 Business impacts arising from acquisition

Where possible, the location of businesses along the corridor has been considered during the design of the project so that impacts to businesses would be minimised

Where the project requires acquisition of a land that a business occupies, it has the potential to impact on the economic productivity and the viability of that business. Where possible, the location of businesses along the corridor has been considered during the design of the project so that impacts to businesses would be minimised.

The 47 commercial and industrial properties impacted by the project contain private businesses, or lease part of their properties to private businesses. Given the industrial and commercial nature of some of the properties within the study area, a number of small private businesses may operate within the one property. Small business types and larger commercial and industrial businesses have been identified where possible. In one instance, an area of publicly owned land used for off street car parking by a private business would be permanently lost as a result of the project. Temporary impacts would also occur to the Bunnings Mascot off-street parking area (as identified in Section 5.1.4.2).

Businesses currently located on land required for the project have been identified where possible and include, but are not limited to:

- Alexandria Landfill;
- Kogarah Golf Course;
- Bunnings Mascot;
- Commercial and industrial businesses associated with the provision of services, such as:
    - Fire protection services
    - Demolition, construction and civil contractor services
    - Material handling equipment and vehicle hire
    - Metalworking and engineering services
    - Document management and destruction, data storage and protection services
    - Catering services

- Commercial and industrial businesses associated with the manufacture, sale and distribution of goods such as:
    - Vehicle tyres and wheels
    - Electronic goods
    - Packaging materials
    - Wholesale food suppliers
    - Apparel, shoes and homewares
    - Jewellery supplies.

The impact of acquisition would have both short term impacts (during construction of the project) and medium to long term impacts (during operation of the project). The economic impacts would be associated with the potential loss of employment and turnover.

Impacted businesses may choose to close down or relocate within the region. Businesses that choose to close down could result in the loss of income for employees and owners and a loss in output in the region. These businesses may cater to the specific needs of residents or industries in the local community and may result in flow-on effects within the region. As detailed consultation with the owners of the acquired businesses was not conducted during the EIS phase of the project, an assessment of the magnitude of turnover and employment impacts was not conducted. However, the businesses identified above provide goods and services to commercial and industrial customers who are not necessarily located in the local area and who would have alternative suppliers as part of normal business practice. The types of retail products listed above comprise of goods which are commonly sold in outlets in most suburbs, including vehicle tyres, electronic goods, clothing, footwear and homewares. Local customers of these businesses would not have to travel far to purchase such goods at alternate outlets.

Due to the nature of current business activity in the areas surrounding the commercial properties to be acquired, it is not anticipated that the viability of adjacent or surrounding businesses would be impacted by land acquisition. Businesses in these locations do not generally provide complementary or supplementary goods or services that would be affected by the loss of other business activity in the vicinity of their operations.

The Arncliffe construction compound and motorway operations complex would be located on land owned by Roads and Maritime and Rockdale City Council. The partial acquisition and temporary occupation of the Kogarah Golf Course during construction would result in the temporary reduction of the facility from an 18-hole course to a 9-hole course. The footprint for the Arncliffe construction compound, as shown in Figure 5, has been negotiated with Kogarah Golf Course to assist with maintaining a 9-hole course, and to avoid infrastructure on the course where possible, such as water storage tanks. The project would not require the reconfiguration of any fairways. Golf course ponds within the Arncliffe construction compound footprint would be removed. The construction compound would be occupied for the duration of the construction period of around three and a half years. The indicative program for works to be conducted within the Arncliffe construction compound, along with further detail regarding the footprint and construction activities to be undertaken, is provided in Section 6.5 of the EIS.

Members and users of the golf course are likely to experience amenity impacts during their visit in areas in proximity to the project. These impacts could result in a reduction in turnover though the loss of memberships and a reduction in the use of club facilities. The impact on the golf course may result in temporary closure of the whole course during this transition. Golf course users may use other facilities during this time as a number of alternate golf courses remain in the general vicinity of the project. These include:

- Marrickville Golf Club, Marrickville.
- Tempe Golf Driving Range, Tempe.
- Bexley Golf Club, Bexley.
- Moore Park Golf, Moore Park.
- The Australian Golf Club, Rosebery.
- The Lakes Golf Course, Eastlakes.
- Eastlake Golf Club, Kingsford.

- Bonnie Doon Golf Club, Pagewood.
- Botany Golf Club, Botany.

The property acquisition and partial occupation of the golf course during construction and any associated compensation would be undertaken in accordance with the Roads and Maritime Land Acquisition Information Guide (Roads and Maritime, 2012) and under the terms of the *Land Acquisition (Just Terms Compensation) Act 1991*. Compensation provided as part of the acquisition is anticipated to assist with loss of revenue, where reasonable, and assist with the ongoing viability of the business during the construction period. SMC, on behalf of Roads and Maritime, is consulting with the golf course and would continue to do so during construction. At the completion of project construction, any land temporarily occupied for construction of the project has the potential to be rehabilitated and returned to its original land use (possibly reconfigured within the construction footprint).

The land required for the project during construction and operation at Arncliffe, and adjoining areas are subject to the *Sydney Regional Environmental Plan No. 33 – Cooks Cove* (SREP 33), a deemed State Environmental Planning Policy. The SREP zones the golf course for future infrastructure (special uses), employment (trade and technology) and open space uses. Action has not been taken at this time to give effect to these proposed future uses. More recently, the NSW Department of Planning and Environment has commenced investigations of the Cooks Cove area as a potential priority precinct (rezoning). The land required for permanent facilities has been designed and located to minimise the impact on any future development potential for the site as per the SREP, and any impacts are not considered to be significant. However, any future proposals (including rezonings) that include multi-storey buildings would need to consider the performance of the future ventilation facility.

The St Peters interchange would be located mostly on land occupied by the Alexandria Landfill. Historically, and prior to acquisition, the site was operated by Dial-A-Dump Industries Pty Ltd as a non-putrescible solid waste landfill with additional waste storage and recycling activities. The operations of the previous landowner ceased on this site in December 2014, following the acquisition of the site by the NSW Government. The site no longer accepts waste, and is currently operating under existing development consents and Environment Protection Licences.

Dial-A-Dump now operates a waste transfer facility at Burrows Road, Alexandria, which would not be impacted by the project. It continues to operate a landfill facility in western Sydney. The majority of operational non-putrescible landfills are located in western and south-western Sydney, with the Alexandria Landfill previously representing a rare example of an active landfill within close proximity to the CBD. However, based on available information on annual disposal rates, the landfill appears to have predominately focused on recycling and storage.

Potential broader impacts associated with the landfill closure may have included changes in the commercial and industrial waste haulage costs and an associated change in productivity for the region. Waste transfer, recovery and recycling facilities are more broadly spread across metropolitan Sydney, and a number of facilities remain in the general vicinity of the project. Examples include:

- SUEZ Transfer Station, Alexandria.
- SUEZ Resource Recovery Centre, Rockdale.
- SUEZ Resource Recovery Park, Chullora.
- SUEZ Resource Recovery Park, Auburn.
- REGYP Recycling Solutions & Gypsum Sales, Bronte.
- Benedict Recycling, Banksmeadow and Chipping Norton.

As such, the impacts on the regional economy associated with this industry given the loss of recycling, storage and transfer functions at the site were unlikely to be significant.

There would be beneficial environmental outcomes as a result of the landfill closure, such as a reduction in ongoing leachate generation and disposal, improvement in the management of odour related impacts and an increase in public open space (with components to enhance integration with Sydney Park).

Land that contains industrial or commercial uses that would be in excess of construction requirements would occur in limited circumstances, being:

- Three industrial properties at the western surface works which would be fully acquired for construction compounds.
- Land at Kogarah Golf Course, which is discussed in detail above.
- Areas of St Peters interchange, which would be required for the construction of the future M4-M5 Link.
- Two properties that would be impacted by the local road upgrades.

Commercial and industrial properties that would be acquired and would be in excess of land requirements at the western surface works and local road upgrades may be made available for future permissible land uses following the completion of construction. The land required to support the future M4-M5 construction would be subject to any future approval for that project. However, the masterplan for the St Peters interchange nominates a significant portion of this land for open space purposes in addition to roads and ancillary infrastructure.

### 5.2.4 Changes to accessibility

Changes in access arrangements and parking have the potential to impact businesses by isolating them from customers or delivery/pick-up activities required for business operation.

Due to the extensive change in the road layouts for the construction and operation of the St Peters interchange and the local road upgrade works, some properties along Euston Road and Gardeners Road would have temporary modifications to driveways as part of construction works and road widening.

A survey was conducted by WestConnex Delivery Authority in June 2015 to determine current parking and access arrangements for businesses located along Euston Road in St Peters. The majority of these businesses identified that both heavy and light vehicle access for delivery and / or pick-up activity on their property was required for current business activities. There is the potential for business turnover and employment to be impacted where business activities are temporarily impeded due to reduced access.

Parking arrangements may influence a customer's decision where to shop. No reduction in on-street parking is proposed in the area of the western surface works construction compounds. As there is currently no on-street parking along Marsh Street, Wickham Street, West Botany Street and Princes Highway in the vicinity of Arncliffe construction compound, no parking impacts are anticipated for local businesses in this area.

On-site light vehicle parking would be provided for the construction workforce to minimise impacts on business and customer parking on local streets due to reductions in the availability of on-street parking on the local roads. Off-site parking would be discouraged, which would be regularly reinforced through project inductions and toolbox talks. Construction personnel would be encouraged to use public transport where possible, and consider other modes of transport such as carpooling.

On-street parking along Campbell Road and Euston Road would be removed during construction (refer to Section 5.1.4). The survey of businesses located along Euston Road also identified that these businesses currently rely on on-street parking for customers and staff and the current level of provision was already considered insufficient for current business activities. As such, it is likely that customers and staff currently use parking spaces available along other local roads in the area. As the demand for on-street parking may reduce with the acquisition of existing properties around this area, it is anticipated that the impact of the reduction in on-street parking during the construction period could also be reduced. Consultation with Bunnings Mascot would also occur to manage temporary disruptions to off-street parking at its premises.

While the project would deliver long term benefits to the freight industry (once complete), businesses reliant on freight or commercial vehicle activities may be impacted by increased congestion and decreased travel times during the construction of the project. Businesses reliant on local and regional deliveries may experience increased delivery costs due to increased travel times and the resulting labour and operating costs. Due to increases in delivery costs and times, customers may take their business elsewhere.

Increased congestion from reduced traffic lanes and/or travel speeds due to the construction of the project would impact freight movements along the M5 East Motorway, the Princes Highway and the wider road network, especially those accessing Sydney Airport and Port Botany from the south-west of Sydney. Increased congestion would result in the temporary increase in travel times for freight movements. As a result, businesses may experience an increase in freight costs associated with the increased time shipment takes in the supply-chain.

## 5.3 Cumulative impacts

Cumulative impacts to local and regional communities and businesses are most likely to result from the construction of the King Georges Road Interchange Upgrade project, M4 East, extension of the Marrickville Metro Shopping Centre, Green Square Development, Wolli Creek redevelopment area, Mascot Station Town Centre, and Sydney Airport related-projects (such Sydney Airport T3/T3 Ground Access Solutions project). The construction of the future M5-M5 Link and future Sydney Gateway would also potentially be under construction at the same time as the project, subject to obtaining planning approval.

Cumulative impacts are likely to intensify the impacts identified above, particularly with regard to employment and economic stimulus. The demand for labour for major projects such as this project, other WestConnex projects and and other similar projects in the area would increase employment opportunities for local residents. There is potential for wages to increase due to high demand for construction workers.

The opportunity for local businesses to supply goods or services to the construction of these projects and their construction workforces has the potential to increase business turnover due to high demand from the multiple projects.

Construction fatigue is likely to arise for motorists and users of the M5 Motorway corridor and King Georges Road due to the King Georges Road Interchange Upgrade project. The King Georges Road Interchange Upgrade project is currently under construction and scheduled for completion in 2017. As such, the cumulative period, of both project's construction occurring simultaneously, spans two years.

Residents and businesses located in areas of overlap with the other WestConnex projects or other local projects are likely to experience extended periods of amenity impacts due to increases in noise, increases in dust levels and changes in visual amenity due to the construction of these projects.

There is the potential for construction vehicles for the King Georges Road Interchange Upgrade project to contribute further to congestion on the local road network near the western portal. Changes in amenity would be intensified by cumulative construction traffic due to the concurrent construction of these projects, including the potential for increased noise and vibration, decreased air quality and reduced visual amenity along haulage routes.

Subject to environmental planning approval, there is the potential for construction of the future M4-M5 Link to commence in 2019 when the New M5 would be in the late stages of construction. The future Sydney Gateway may also commence in early 2018. It is expected that peak construction of the New M5 would be complete, and the construction activities would largely comprise mechanical and electrical fit-out and landscaping and rehabilitation works. There is the potential for localised cumulative construction works around the St Peters interchange as a result of the future M4-M5 Link or Sydney Gateway. This includes a portion of the site potentially used for a construction compound for the future M4-M5 Link. As the New M5 and these projects would likely be at different stages and unlikely to have concurrent peak construction periods, and the local road upgrades would be complete, it is expected that the potential for significant cumulative impacts would be limited.

During construction, ongoing consultation would be undertaken with local communities potentially affected by concurrent construction of projects that form part of the WestConnex program of works. Additionally, consultation would be undertaken with proponents of other nearby projects to increase the overall awareness of project timeframes and impact.

## 5.4 Summary of key findings

During the construction of the project, there is the potential for a boost in the economy due to construction expenditure in the region. Local business would benefit from this expenditure through purchases made by construction businesses and associated workers to build and support the development of the project. Economic benefits associated with the project support the ongoing or improved economic vitality of the area, which is valued by the community and local government.

Employment opportunities would grow in the region through the potential increase in business customers and through the increase in demand for construction workers. The increase in demand for labour may increase wages in the region, particularly for construction workers, who would be in high demand.

It is estimated that construction expenditure would directly and indirectly contribute an estimated $1.8 billion of output, $400 million of household income, around 4,390 FTE jobs and $670 million in value added to the NSW economy on average per year of construction.

The majority of construction activity would occur underground, which would limit the extent of amenity impacts along the corridor. Impacts would mainly arise at the location of surface works, in proximity to construction sites and compounds and along transport routes from the construction traffic. Potential impacts to the amenity of residents, businesses and the broader community during construction may occur as a result of:

- Increases in noise and vibration associated with construction works, including increases in road traffic from construction vehicles and the construction workforce.
- Increased dust emissions associated with surface disturbance and / or the handling, transport and disposal of soil.
- Changes in visual amenity due to the introduction of construction compounds or activities.

Changes in amenity may also conflict with community values, contributing to a loss of or change in a community's sense of place, and subsequently a community's perceived identity. This is particularly relevant for the community's value of parks and open space, recreational and sporting facilities and pedestrian and cycling access.

Amenity impacts during construction of the project are discussed in more detail in Chapter 10 (Air quality), Chapter 11 (Human health), Chapter 12 (Noise and vibration) and Chapter 14 (Visual impact and urban design) of the EIS.

The project requires the acquisition or temporary occupation (lease) of 109 properties that are currently used for residential, business or community/recreational facility purposes. The project has been designed to minimise the need for land acquisition, where practical, and to limit the severance and sterilisation of private properties. An additional 50 properties would be impacted that are already owned by the NSW Government (Roads and Maritime or other NSW government agencies). This includes the Alexandria Landfill site.

Properties impacted by the project would comprise the following:

- A total of 47 industrial and commercial (including Kogarah and Canterbury golf courses) properties would be impacted by the project by full or partial acquisition, or temporary occupation. Of the 47 properties, 18 are already owned by Roads and Maritime or other NSW Government agencies (for example, Alexandria Landfill). Of the 18 properties owned by NSW Government or other NSW Government agencies, some are not occupied or have recently been vacated.
- A total of 69 are residential properties, of which 21 are owned by Roads and Maritime. All residential properties would be subject to full acquisition and in most instances, these properties do contain residences. The exception is the partial acquisition of three private properties that has been zoned for road purposes located between residential apartments and current alignment of Euston Road.
- Additional properties include those that are vacant, within a road reserve, or contain existing roads, such as the M5 East Motorway and properties along the Princes Highway. These are within the ownership of Roads and Maritime or other NSW Government agencies.
- Four public recreational facilities (M5 Linear Park, Sydney Park, May Street Reserve and Camdenville Park).

Recreational and community facilities identified as being impacted during the construction of the project include:

- M5 Linear Park.
- Canterbury Golf Course.
- Kogarah Golf Course.
- Sydney Park.
- May Street Reserve.
- Camdenville Park.

The impact of acquisition on businesses would have both short term impacts (during construction of the project) and medium to long term impacts (during operation of the project). The economic impacts would be associated with the potential loss of employment and turnover. The Alexandria Landfill was acquired in December 2014 and no longer receives waste.

The temporary occupation and partial acquisition of the Kogarah Golf Course during construction and the temporary reduction of the facility from an 18-hole course to a nine hole course may result in a reduction in

turnover. Partial acquisition and temporary occupation during construction and any associated compensation would be undertaken in accordance with the Roads and Maritime Land Acquisition Information Guide (Roads and Maritime, 2012) and under the terms of the *Land Acquisition (Just Terms Compensation) Act 1991*. Compensation provided as part of the acquisition is anticipated to assist with loss of revenue, where reasonable, and assist with the ongoing viability of businesses during the construction period. Commercial or industrial land in excess of operational requirements would be made available for permissible land uses following the completion of construction.

Changes in access arrangements and parking during construction have the potential to impact private property and local businesses, particularly around the St Peters interchange, by reducing access for residents, customers or delivery/pick-up activities required for business operation, potentially reducing business activity and impacting turnover and employment. No reduction in on-street parking is proposed in the area of the western surface works or Arncliffe construction compounds.

On-site light vehicle parking would be provided for the construction workforce to maintain the availability of on-street parking for residents, businesses and customers, and construction personnel would be encouraged to use other modes of transport where possible.

Some minor increases in congestion may be experienced on local roads in proximity to haulage routes and around construction compounds and surface works, however this is not anticipated to be significant. Businesses reliant on freight, local or regional deliveries and commercial vehicle activities may be impacted by increased congestion and decreased travel times during the construction of the project, and may experience increased delivery costs.

Cumulative impacts to local and regional communities and businesses are most likely to result from the concurrent construction of the King Georges Road Interchange Upgrade project, M4 East, the future M4-M5 Link, future Sydney Gateway and other local projects and the associated employment and expenditure in Greater Sydney. Cumulative benefits are likely to intensify employment and economic stimulus impacts in the region.

Residents, businesses and motorists are likely to experience congestion, extended periods of amenity impacts and construction fatigue due to the concurrent construction of the other WestConnex projects or local projects in the area.

# 6.0 Impact assessment – Operation

During the operation of the project, there is the potential for positive and negative impacts. An assessment of the potential impacts has been undertaken to determine the type, direction and magnitude of the potential impacts.

This chapter presents the potential social and economic impacts during the operation of the project. The potential construction impacts are presented in Chapter 5.0.

The following potential impacts during project operation have been identified:

- Amenity and health impacts on road users, businesses and the community arising from changes in noise and vibration, air quality and visual amenity.
- Acquisition of residential properties, open space/recreational land and businesses.
- Changes to walking and cycle paths.
- Changes in accessibility to residential properties, community facilities and businesses arising from increased congestion, reductions in car parking availability, rerouting of property access and egress and temporary closure of local roads.
- Changes in business turnover and employment due to loss of passing trade, changes in accessibility to businesses and reduced visibility.
- Cumulative impacts due to concurrent operation activities associated with other major infrastructure projects in the region.

Further details of operational impacts are presented in the following sections, with potential social and economic impacts discussed separately.

## 6.1 Social

### 6.1.1 Amenity and health

Permanent changes in amenity and health during the operation of the project would occur as a result of:

- Increases in noise and vibration associated with increases in road traffic.
- Decreased air quality associated with increased road traffic, the operation of ventilation stacks and smoke extractors.
- Changes in visual amenity due to permanent operation facilities.
- Changes in commuting behaviour and air quality resulting in changes in the health of residents and road users.

The operational noise assessment determined that a total of 145 residential receivers were identified as eligible for consideration of additional noise mitigation through at-property treatment due to predicted road noise levels in 2021 and 2031. St Peters Public School was also identified as being eligible for consideration for additional noise mitigation as noise levels are likely to exceed the internal noise criteria with windows are open. The requirement for at property mitigation would be confirmed during detailed design.

The following noise impacts have been identified during operation:

- The permanent ventilation structures located at Kingsgrove, Bexley, Arncliffe and St Peters would comply with the applicable criteria.
- During operation traffic volumes would increase around the St Peters interchange, including Campbell Street/Campbell Road and Euston Road. The increase in traffic volumes would result in increased noise levels for residents located adjacent to these roads. Some residents would experience noise levels that exceed the maximum noise criteria.
- Properties around the western surface works area would experience an overall reduction in noise compared to the current situation.

During the operation of the project a number of properties have been identified where road noise has the potential to be elevated and adversely affect health. For these properties mitigation measures are required to protect the health of local residents. These mitigation measures may include low noise pavement, noise barriers and/or noise treatments on individual properties. These mitigation and management measures are detailed in Technical Working Paper: Noise and vibration.

The project is expected to result in a decrease in total pollutant levels in the community. The project is expected to result in a redistribution of impacts associated with vehicle emissions, specifically in relation to emissions derived from vehicles using surface roads. For much of the community this would result in no change or a small improvement (ie decreased concentrations and health impacts), however for some areas located near key surface roads a small increase in pollutant concentration may occur. Potential health impacts associated with changes in air quality (specifically nitrogen dioxide and particulates) within the local community have been assessed and are considered to be acceptable.

The operation of the ventilation facilities would not prevent continued use of surrounding land for residential and other purposes. Future development of land (including re-zonings) in the vicinity of the ventilation facilities that may involve multi-story buildings would need to consider the air dispersion performance of the New M5 facilities.

The potential air quality impacts and human health impacts associated with the ventilation facilities are discussed in Chapter 10 (Air quality) and Chapter 11 (Human health) of the EIS. A detailed assessment of air quality is provided in the Technical Working Paper: Air quality in Appendix H of the EIS.

Residents, road users, community facilities users, pedestrians and cyclists are likely to experience changes in visual amenity due to the introduction of new infrastructure. Visual amenity impacts are likely to occur where permanent facilities are located;

- At the western surface works where the open space at Beverly Grove North would be reduced due to the widening of the motorway corridor and the change in outlook. This would include the removal of the noise mound, which provides vegetated screen, and the removal of Cooks River / Ironbark Castlereagh Forest (an endangered ecological community).
- At the western surface works, where a new noise barrier would be installed on the northern and southern sides of the motorway corridor
- At the western surface works where the Kingsgrove motorway operations complex (MOC1) would be located. However, the impacts at this location would moderate to low in most instances given the proximity of the nearby industrial area with the greatest impact occurring for the recreational users of the shared path that would run adjacent to the motorway;
- At the Bexley Road surface works where the Bexley Road South motorway operations complex (MOC2) would be located. However, the impacts at this location would moderate to low in most instances given the distance to residential receivers. Impacts would be the greatest for the users of the M5 Linear Park that runs adjacent to the motorway given the reduction in available open space
- At the Arncliffe surface works where the Arncliffe motorway operations complex (MOC3) would be located, given the magnitude of change associated with the introduction of the ventilation facility; and
- At the St Peters interchange. This would include new road infrastructure, the St Peters motorway operations complex and Burrows Road motorway operations complex, including the St Peters interchange ventilation facility.
- Local road upgrades, in particular the widening of Campbell Road/Street and Euston Road which would change the character and scale of these roads.

A number of mitigation measures for visual impact issues of operational structures have been considered to address visual amenity impacts on residents and the community due to the introduction of new infrastructure (refer to Chapter 14 (Visual impacts and urban design) of the EIS). Opportunities for local centre and street revitalisation are also assessed in the Urban design report for the project (refer to Appendix L of the EIS).

Forecast traffic volumes indicate that King Georges Road, Stony Creek Road and the Princes Highway south of the M5 East Motorway interchange would experience increases in traffic after the opening of the project due to some drivers diverting through these roads to avoid the introduction of the motorway tolls on the M5 East Motorway. This effect is larger during off-peak hours, as Stony Creek Road is already heavily congested during peak hours.

The increase in traffic levels on these alternative routes due to the introduction of tolls is expected to decrease amenity for residents, shoppers, community facilities users, schools and motorists on these roads. On these alternative routes a maximum increase of 1.9 dB(A) has been identified (an increase in noise of 2 dB(A) is generally considered barely perceptible). The impact has been considered to be minor and would not appreciably impact receivers.

### 6.1.2 Recreational and community facilities impacts

The project would result in the permanent loss of some areas of recreational land, being the M5 Linear Park, Kogarah Golf Course, Sydney Park, Camdenville Park and May Street Reserve. Recreational land temporarily occupied for the construction of the project, and the associated impacts, are provided in Section 5.1.3.

Part of the M5 Linear Park would also be permanently impacted and subject to acquisition for widening of the M5 East Motorway to accommodate the project, as well as the construction of the Kingsgrove and Bexley South motorway operations complexes. The land impacted is currently used for walking and cycle paths and as passive open space. Given that accessibility to parklands, open space and pedestrian and cycle paths are highly valued by the local community, these impacts may affect park user's sense of place. While the available area for recreation would be reduced, the function of the open space is unlikely to significantly change as a result of the project. During detailed design, the urban design and final configuration of the noise barrier would be refined and subject to community consultation.

The partial acquisition of Sydney Park would be required for the project, which includes strip acquisition required along Euston Road. As Sydney Park is a highly valued green space within the local community, used by a number of people for various sporting, recreational, pedestrian and cycling activities, these impacts may be perceived as a negative effect on the park user's sense of place and the perceived identity of the surrounding community. However, elements such as the Campbell Road pedestrian bridge would enhance opportunities for access for communities located to the east of Alexandra Canal (discussed further in Section 6.1.3). Recreational use of the park, including the use of walking and cycle paths within the park, would not be affected by the partial acquisition.

Land on the site of the St Peters interchange not used for New M5 or future road infrastructure would be used to create additional open space for recreation and community use, in line with the community values identified in Chapter 4.0.

A small area of the park would be acquired to accommodate the local road upgrades. Small areas along its western boundary would be permanently acquired as a result of the intersection works, however, this would not have an impact on the recreational values of this open space. Further, subject to agreement with Marrickville Council, BMX facilities would likely be provided at Camdenville Park or as otherwise agreed with the council

May Street Reserve would be impacted permanently by the project, and remaining land would be landscaped to reconfigure the reserve to incorporate other portions of residual land that is not required for the project.

### 6.1.3 Changes to accessibility

The project facilitates the provision of increased accessibility to key markets, employment locations and community facilities through the introduction of new road, public transport and pedestrian/cycle infrastructure.

The local road upgrades would include provision of new and upgraded pedestrian and cycle infrastructure, which is valued by the local community in terms of access and in supporting an active lifestyle. This infrastructure has been designed to maintain and enhance pedestrian and cyclist accessibility and connectivity, particularly around the St Peters interchange and Sydney Park.

The most significant new infrastructure would include the construction of a pedestrian and cycle bridge across the on and off ramps at the St Peters interchange and construction of a pedestrian and cycle bridge across Campbell Road.

Other key pedestrian and cycle infrastructure to be delivered as part of the local road upgrades would include:

- A dedicated cycle path along Campbell Street between Unwins Bridge Road and Barwon Park Road.
- A shared path along the western side of Euston Road between Campbell Road and Sydney Park Road.
- An on-road cycle lane along Bourke Road between Campbell Road and Church Avenue.
- Retention of the on-road cycle lane on Bourke Road, north of the Campbell Road extension.
- Provision of footpaths along all local roads upgraded as part of the project.

The upgrades to pedestrian and cycle infrastructure would provide for a safe cyclist and pedestrian environment by minimising the interface of cyclists and pedestrians with vehicular traffic, and would also provide a regional cycle connection between Mascot and Marrickville.

The project would also result in the permanent realignment of a shared path within the M5 Linear Park on both sides of the motorway at the western surface works. The realignment provides the same level of access to the park as before the project, however, the path would be realigned to account for the permanent operational infrastructure for the New M5. Given that the opportunity to walk or cycle in this area would be maintained, community values of pedestrian and cycling access and an active lifestyle would also be maintained.

The access changes to residential properties or community facilities to occur due to the operation of the project are:

- Maintenance of an existing signalised intersection at Flora Street and Marsh Street, which would be constructed as part of the Marsh Street widening project (Roads and Maritime) to enable access in and out of the Arncliffe motorway operations complex. This intersection provides access to residences to the north of the site.
- Changes to one way arrangements for Barwon Park Road to minimise the potential for vehicles using this local road for 'rat-running'.

Key changes to parking as a result of local road upgrades would include:

- On-street and off-street parking would be provided along Campbell Street between Princes Highway and Unwins Bridge Road, which presently does not accommodate on or off street public parking. In total, around 34 on street parking spaces and 26 off street parking spaces would be provided. The final numbers would be confirmed during detailed design.
- Parking along Campbell Road between Barwon Park Road and Euston Road would be removed.
- At project opening, parking along Euston Road would be provided during off-peak periods (around 111 spaces, subject to detailed design). However, by around 2031, the traffic performance demands along Euston Road may require all lanes to be available for traffic and off-peak parking may need to be removed. The removal of car parking would be to the discretion of Roads and Maritime.
- Parking along Gardeners Road between the Kent Road and Gardeners Road intersection to the end of Gardeners Road would be removed.
- Parking on Albert Street would be removed.

A summary of the indicative positive and negative impact on on- and off-street) parking is shown in Table 7. The final numbers would be confirmed during detailed design. The more significant reduction in spaces would have occurred at the commencement of construction

**Table 7 Indicative permanent impact on parking**

| Road section | Indicative impact |
|---|---|
| Campbell Street, between Princes Highway and Unwins Bridge Road | Addition of 34 on-street and 26 off-street spaces |
| Albert Street | Loss of 44 spaces along both sides |
| Campbell Road, between Barwon Park Road and Burrows Road | Loss of 111 spaces along both sides |
| Burrows Road, south-west of Campbell Road | Loss of eight spaces along both sides |
| Burrows Road, north-east of Campbell Road | Loss of 15 spaces along both sides |
| Euston Road, north of Sydney Park Road intersection | Loss of 24 spaces along both sides |
| Huntley Street, east of Euston Road | Loss of 28 spaces along both sides |
| Princes Highway | Loss of 18 spaces along both sides |
| May Street | Loss of 38 spaces along both sides |
| Unwins Bridge Road | Loss of 33 spaces along both sides |
| Brown Street | Possible loss of up to six spaces during integration / tie-in works |
| Florence Street | Possible loss of up to six spaces during integration / tie-in works |
| St Peters Street | Possible loss of up to six spaces during integration / tie-in works |

| Road section | Indicative impact |
|---|---|
| Gardeners Road, between Kent Road and cul-de-sac of Gardeners Road | Loss of 47 on-street spaces |
| Bourke Road, north of Bourke Street / Gardeners Road intersection | Loss of 16 off-street spaces |
| Albert Street | Addition of around 44 on-street spaces |

The project has the ability to connect residential communities with locations of employment, due to reduced congestion and decreased travel times. The project provides greater accessibility for residents of south and south-west Sydney to access Sydney Airport and Sydney CBD. This benefit is in line with community aspirations identified in Chapter 4.0 and is anticipated to have a positive impact on the local community's sense of connectedness and community cohesion.

## 6.2 Economic

### 6.2.1 Changes to business turnover and employment

The assessment of direct, indirect and total impacts of operational expenditure has been conducted using the economic multiplier methodology presented in Section 2.1.

During the operation of the project, up to 116 FTE jobs are expected to be created for the created for the operation and maintenance of the project.

Table 8 presents the direct, indirect and total impacts of operational expenditure on the New South Wales economy per year of operation:

- Operation of the project, in terms of output, is estimated to contribute around $35 million directly, with flow-on (indirect) effects of around $9 million, giving an estimated total impact of around $44 million.
- Household income generated by operation of the project is estimated to be around $8 million directly, with flow-on effects of around $2 million, giving an estimated total household income contribution of around $10 million.
- Direct employment supported by the operation of the project is estimated to average 86 FTE positions per year of operation. Flow-on employment is estimated to average 30 FTE positions per year of operation, giving a total of 116 FTE positions per year of operation.
- Value added attributable to the operation of the project is estimated to be $14 million directly, with flow-on effects of $4 million, giving an estimated total value added contribution of $18 million. This is the estimated contribution to Gross State Product (GSP).

**Table 8 Direct, indirect and total impacts of operational expenditure on the New South Wales economy per year of operation**

| Impact | Increase in industry output | Increase in household income | Increase in employment | Increase in value added |
|---|---|---|---|---|
| | $ million (2015 prices) | $ million (2015 prices) | Full-time equivalent positions[(a)] | $ million (2015 prices) |
| Direct | 35 | 8 | 86 | 14 |
| Indirect | 9 | 2 | 30 | 4 |
| **Total[(b)]** | 44 | 10 | 116 | 18 |

Source: AECOM (2015)

**Notes:**

(a) Average number of FTE positions supported each year of operation

(b) Totals may not sum due to rounding

### 6.2.2 Changes in passing trade

Changes in traffic volumes and changes to visibility have the potential to impact businesses on the Princes Highway between the M5 East Motorway and the St Peters interchange that are reliant on passing trade. The

New M5 tunnels enable the bypass of the Princes Highway and businesses along that road that were previously visible to passing trade. Studies of bypass impacts in NSW, resulting from reductions in passing traffic and changes in visibility, have shown that the most affected businesses are those directly serving the needs of the motorist such as motor services, food and beverage outlets and, to a lesser extent, accommodation establishments.

Businesses that currently advertise on the Princes Highway between the M5 East Motorway and the St Peters interchange may experience decreased visibility from the reduction in traffic volumes. Visibility is important for businesses that rely on passing trade. Customers of these types of businesses are generally impulse or convenience purchasers. The likely change in through traffic may necessitate potential changes to advertising operations to continue to draw customers to some businesses.

The potential change in the value of passing trade has been estimated based on industry data and changes in volumes of traffic. This provides an estimate of the direct loss of employment and turnover after the opening of the project. It represents the worst case scenario in so far as it does not take account of any increases in turnover due to any changes in the urban landscape of the Princes Highway.

The changes in volumes of traffic along the Princes Highway due to the project have been adopted from the Technical Working Paper: Traffic and transport for the New M5and adjusted to account for light vehicle traffic only, using outputs from the traffic model. For further detail on changes in traffic volumes due to the project, refer to the WestConnex M4 East EIS (Sections 8.4.1 and 8.4.2 of that document). Traffic volumes for 2021 have been used for this assessment.

The linkages with other businesses supplying goods and services to those businesses impacted through a reduction of passing trade were not quantified. These would be indirect or flow-on impacts on employment and turnover resulting from the diversion of through traffic and are likely to be minor.

Passing trade can be defined as those motorists travelling to and from destinations that are beyond the Princes Highway that choose to patronise businesses due to the convenience of the business location. A total of 9 businesses were identified as potentially being impacted by a reduction in passing trade. These include service stations, fast food restaurants and accommodation services located in east bound and west bound directions on Princes Highway between the M5 East Motorway and the St Peters interchange.

In the absence of data from these businesses, the value of the reduction in passing trade has been based on a 'typical' or 'average' business in each of the above industries. Output (or business turnover) was estimated using employment to output ratios published by the ABS (1991-92) and inflated to 2015 prices. This does not take into account efficiencies or inefficiencies within the businesses that could result in higher or lower turnover estimates.

Based on the above methodology, it has been estimated that there could be an annual reduction of around $0.4 million in output and around two full-time equivalent jobs due to loss in passing trade. This equates to a loss of 2.5 per cent of total output and full-time equivalent employment of the businesses reliant on passing trade.

This is a worst case scenario analysis of the impact of the reduction of passing trade based on industry averages and the results presented in Table 9 should be regarded as indicative only.

**Table 9 Potential impacts of business acquisition**

| Type of business | Number of businesses | Annual potential loss of output ($) | Annual potential loss of employment (FTE positions) |
|---|---|---|---|
| Accommodation Services | 2 | 102,000 | 1 |
| Fast Food Restaurants | 4 | 311,000 | 1 |
| Petrol/Service Stations | 3 | 10,000 | 0 |
| **Total** | **9** | **423,000** | **2** |

The degree to which these businesses would be impacted by the reduction in passing trade is dependent on the visibility of the businesses. Any signage/advertising used to attract passing trade may be impacted through reduced visibility. If any of the impacted businesses currently advertise through signage to attract passing trade to their operation, they may be further impacted through the requirement to change advertising methods to continue to attract customers.

Forecast traffic volumes indicate that King Georges Road, Stony Creek Road and the Princes Highway south of the M5 East Motorway interchange would experience increases in traffic after the opening of the project due to some drivers diverting or "rat-running" through these roads to avoid the introduction of the motorway tolls on the New M5 and the M5 East Motorway. This effect is larger during off-peak hours, as Stony Creek Road is already heavily congested during peak hours.

Due to the behavioural nature of these diverting motorists, in that they are utilising non-arterial roads during off-peak hours, it is unlikely that these motorists would have a positive impact on passing trade on businesses located on these roads. Diverting only during non-peak hours indicates that travel time is still considered an important factor in their journey decision.

The assessment of the impacts associated with loss of passing trade should also be considered in the context of, and balanced against, a range of benefits such as travel time improvements, efficiencies for the freight industry and the employment opportunities generated by the project.

### 6.2.3 Amenity (business)

Permanent changes in amenity that may impact businesses during the operation of the project would occur as a result of:

- Increases in noise and vibration associated with increases in road traffic.
- Decreased air quality associated with increased road traffic, the operation of ventilation stacks and smoke extractors.
- Changes in visual amenity due to permanent operation facilities.

As the majority of businesses in close proximity to the New M5 corridor are industrial and commercial businesses, the impact of noise, vibration, air quality and visual amenity are limited. These businesses are not considered sensitive receivers as their business activities are not dependent on amenity. Due to the activities that generally take place in these types of businesses, the working environments generally have low amenity, and, as such, impacts to employees is expected to be marginal.

There would be an increase in traffic using alternative routes as a result of the introduction of tolls on the M5 East Motorway. As noted in Section 6.1.1, this would increase road traffic noise on these routes. However, it would be within accepted criteria. Businesses located along the Princes Highway between the M5 East Motorway and the St Peters interchange, where traffic levels are anticipated to decrease due to the project, may experience improved amenity due to reduced traffic levels. Improved amenity and accessibility due to the project may facilitate urban renewal of this area, attracting businesses that would benefit from improved amenity.

King Street and Enmore Road business precinct contains numerous businesses, including retail, services, restaurants and cafes. The project does not propose to modify King Street, including speed limits or on-street parking arrangements along King Street. In future years, traffic modelling indicates that King Street is expected in most cases to experience reduced or similar peak hour volumes under the 2021 'with project' scenario and 2031 cumulative scenario when compared to the without project scenario (refer to Technical Working Paper: Traffic and Transport (AECOM, 2015a). The exception to this would occur in the 2031 cumulative case, where AM peak hour volumes southbound would increase by around 280 vehicles per hour when compared to the 'without project' scenario. However, this is in the opposing direction to the dominant AM peak hour (which would experience a reduction) and is within the design carrying capacity of the road. As there would not be any significant changes to traffic volumes or no modifications to King Street are proposed as part of this project, the project would not have a significant impact on businesses or amenity along King Street.

### 6.2.4 Changes to accessibility

Changes in accessibility have the potential to impact the viability of a business, depending on the type of business and the ability of that business to respond to any changes. Reduced accessibility would occur if access arrangements for individual businesses or retail centres change as a direct result of the project.

Access to one business would be permanently modified due to the project. Bunnings Mascot would have its access permanently modified to be off Bourke Road to accommodate the proposed widening of Bourke Road and Gardeners Road. It is not anticipated that this change in impact would have any impacts on the viability or operation of the business. The provision of a secondary access point for an additional property on Gardeners Road, near the Bourke Street/Road intersection, may also be required due to strip acquisition. This would be confirmed during detailed design and in consultation with the property owner.

A distribution facility at Gardeners Road would also have altered access due to the construction of the Gardeners Road and Campbell Road bridges. Access to the southern portion of the property would be via Venice Street to Rickety Street while access to the northern portion of the property would be by a new intersection on Campbell Road extension. The Campbell Road access would restrict right hand turn movements out from the northern portion of property and access to Gardeners Road would not be available. This would result in a reduction in access currently afforded to the businesses contained within the facility. However, existing roads, including Campbell Road/Street, Princes Highway and Canal Road would provide opportunities for vehicles wishing to travel east. Due to the decrease in congestion along the Princes Highway between the M5 East Motorway and the St Peters interchange, businesses located in this area are likely to experience increased accessibility to their businesses. Increased accessibility and increase amenity along this section of the Princes Highway may encourage new and diverse businesses into the region and provide the opportunity for urban renewal.

There are no proposed changes to current car parking arrangements along King Street as a result of this project.

Changes to on-street and off-street parking are discussed in Section 6.1.3. Changes to parking are not anticipated to have a significant impact on business activity, as most businesses within the area can accommodate off-street parking. Additional on-street and off-street parking provided on Campbell Street as part of the project would help to alleviate impacts associated with removal of parking in other nearby areas. Existing on-street parking would still remain on other local roads.

### 6.2.5 Efficiency impacts on freight and commercial vehicles

Businesses that rely on commercial and freight vehicle movements have the potential to significantly benefit from the operation of the project. The following potential impacts on these businesses, during project operation, have been identified:

- Increased productivity from decreased congestion and the reduction in travel times for commercial and freight movements
- Increased economic activity from increased efficiency of freight and resulting increased economic output.
- Reduced costs of commercial and freight movements.

The traffic assessment conducted for the project, determined that the project would result in reduced travel times and decreased congestion along the M5 Motorway corridor. It is anticipated that travel times along the M5 East Motorway between King Georges Road and Foreshore Road would decrease by six to eight minutes during the AM and PM peaks due to the project.

Without the project, congestion along the M5 Motorway corridor would increase further, impacting on travel speeds. Reduced travel speeds (and the resulting increase in travel time) impact on road freight and commuter vehicle productivity and commuter vehicle occupants, representing an economic cost to the state.

The reduced travel times for freight and commercial vehicles would reduce operational costs associated with fuel and wages and improve safety by reducing stop-start traffic conditions caused by congestion. In 2013, travel time for freight movement has been valued by Transport for NSW at $57.84 per vehicle hour, demonstrating significant benefits associated with reduced travel times.

Reduced travel times would also improve the efficiency of freight and commercial vehicle movements, given the improvements in capacity on the M5 East Motorway and the introduction of the New M5. Access to Sydney Airport and Port Botany improves business access to interstate and international markets. This would lead to improvements in the efficiency and reliability of Sydney's freight network, facilitating more efficient movement of goods through the supply chain and ultimately enhancing productivity. A part of the National land Transport Network, the New M5 would not only benefit Sydney's freight network, but would also benefit regional and interstate movements by improving connectivity and facilitating efficient movements across Sydney.

The reduced travel times would also reduce operational costs associated with fuel and wages and improve safety by reducing stop-start traffic conditions caused by congestion. In 2013, travel time for freight movement has been valued by Transport for New South Wales at $57.84 per vehicle, per hour, demonstrating significant benefits associated with reduced travel times. As the cost of freight movement decreases, the cost of the goods moving through the supply-chain decreases accordingly. As such, there is the potential for cost savings to be passed on to consumers of transported goods.

Commercial vehicle movements are generally more focused around commercial centres as workers travel between major centres for business, such as professionals (or white-collar workers), tradesmen and salesmen. The M5 Motorway corridor acts as a main thoroughfare for commercial vehicles as they make deliveries and support services to or from major centres in western and south-western Sydney, Port Botany, Sydney Airport and the Sydney CBD. In addition, the M5 Motorway corridor plays an important role in the National Land Transport Network, enabling commercial vehicle movements across Sydney and to regional and interstate markets. Improvements in efficiency and reliability of the road network leads to the more efficient commercial vehicle movements and therefore has the potential to reduce costs and enhance the productivity of this workforce.

In summary, the project would improve network efficiency, delivering travel time savings and provide more efficient movement of freight and commercial vehicles, thereby reducing operational costs. The project would also provide increased road capacity along the M5 Motorway corridor, which is a key corridor for the movement of freight between Sydney Airport/ Port Botany and the western and south-western suburbs of Sydney and commercial vehicle movements between major centres.

## 6.3 Cumulative impacts

Cumulative impacts to the economy and businesses are most likely to result from the concurrent operation of the wider WestConnex project.

The freight industry would benefit greatly by enabling the efficient movement of traffic between western and south-western Sydney and interstate and international markets through connections with the wider National Land Transport Network, Sydney Airport and Port Botany. WestConnex provides one of the missing links in the Sydney Motorway network by providing a connection between the M4 and M5 Motorways, resulting in benefits for freight including the opportunity to streamline interstate movements around and through Sydney. This provides businesses with connections to service more diverse and dispersed markets across Sydney.

Residents and businesses located in areas of overlap with other WestConnex projects or other local projects (such as Sydney Airport projects or Mascot Station Centre Precincy Masterplan) may experience cumulative amenity impacts due to increases in traffic noise, changes in traffic patterns and changes in visual amenity due to new infrastructure associated with these projects.

The Technical Working Paper: Traffic and transport (Appendix G of the EIS) identifies that although the cumulative operation of the full WestConnex program of works would increase traffic demand, the additional capacity within the road network provided by these projects would effectively distribute and accommodate the predicted increases in traffic. As a result, there would be a cumulative benefit of the projects, resulting in significant increases in travel speeds through the local road network, and a reduction in average travel times.

## 6.4 Summary of key findings

Operational expenditure was estimated to contribute a total of $44 million in output, around $10 million in household income, 116 full-time equivalent jobs and $18 million in value added per year of operation of the project. Economic benefits associated with the project support the ongoing or improved economic vitality of the area, which is valued by the community and local government.

As a significant volume of traffic currently using the Princes Highway would be diverted into the tunnel, businesses that are reliant on passing trade would be affected by the project. It has been estimated that there could be an annual reduction of around $0.4 million in output and around two full-time equivalent jobs due to loss in passing trade. This equates to a loss of 2.5 per cent of total output and full-time equivalent employment of the businesses reliant on passing trade. Reductions in passing trade would potentially be offset to some degree by improved amenity and accessibility for the businesses affected.

Due to the behavioural nature of motorists that divert along King Georges Road, Stony Creek Road and the Princes Highway south of the M5 East interchange in order to avoid the proposed toll on the New M5 and M5 East Motorway, it is unlikely that these change would have a positive impact on passing trade on businesses located on these roads.

Permanent changes in amenity and health during the operation of the project would occur as a result of:

- Increases in noise and vibration associated with increases in road traffic.
- Decreased air quality associated with increased road traffic, the operation of ventilation stacks and smoke extractors.
- Changes in visual amenity due to permanent operation facilities.

The operational noise assessment determined that a total of 145 residential receivers were identified as eligible for consideration of additional noise mitigation through at-property treatment due to predicted road noise levels in 2021 and 2031. St Peters Public School was also identified as being eligible for consideration for additional noise mitigation as noise levels are likely to exceed the internal noise criteria with windows are open. The requirement for at property mitigation would be confirmed during detailed design.

According to the Technical Working Paper: Human health (Appendix I of the EIS), changes in the urban environment associated with the project have the potential to result in a range of impacts on the health and wellbeing of the community. The potential for changes to result in impacts on health and wellbeing is complex. Changes that may occur have the potential to result in both positive and negative impacts. Positive impacts include economic benefits, changes in traffic levels in some areas, increased public open space following the closure of Alexandria Landfill and improvements in pedestrian and cycle access in some areas following completion of construction. Negative impacts may occur as a result of property acquisitions, visual changes, noise impacts and changes in access/cohesion of local areas. These may result in increased levels of stress and anxiety. In many cases the impacts identified are either short-term (associated with construction only) and/or mitigation/management measures have been identified to minimise the impacts on the community.

Access to two businesses would be permanently modified due to the project. Bunnings Mascot would have its access permanently modified to be off Bourke Road to accommodate the proposed widening of Bourke Road and Gardeners Road. It is not anticipated that this change in access would have any impacts on the viability or operation of the business.

A distribution facility at Gardeners Road would also have altered access due to the construction of the Gardeners Road and Campbell Road bridges. This would result in a reduction in access currently afforded to the businesses contained within the facility. However, existing roads, including Campbell Road/Street, Princes Highway and Canal Road would provide opportunities for vehicles departing the facility to travel east.

The provision of an additional access point for an additional property on Gardeners Road, near the Bourke Street/Road intersection may also be required due to strip acquisition.

Changes to parking are not anticipated to have a significant impact on business activity, as most businesses within the area can accommodate off-street parking. Additional on-street and off-street parking provided on Campbell Street as part of the project would help to alleviate impacts associated with removal of parking in other nearby areas. Off-peak on street parking on Euston Road would be reinstated upon completion of construction

The project would improve network efficiency, delivering travel time savings and provide more efficient movement of freight and commercial vehicles, thereby reducing operational costs. The project would also provide increased road capacity along the M5 East Motorway and the New M5, which is a key corridor for the movement of freight to Sydney Airport/ Port Botany and commercial vehicle movements between major centres.

Cumulative impacts to the economy and businesses are most likely to result from the concurrent operation of the wider WestConnex project. The freight industry will benefit greatly by enabling the efficient movement of traffic between western and south-western Sydney and interstate and international markets through connections with the wider National Land Transport Network, Sydney Airport and Port Botany.

The project has the ability to connect residential communities with locations of employment, due to reduced congestion and decreased travel times. The project provides greater accessibility for residents of south and south-west Sydney to access Sydney Airport and Sydney CBD. This benefit is in line with community aspirations identified in Chapter 4.0 and is anticipated to have a positive impact on the local community's sense of connectedness and community cohesion.

Although the cumulative operation of the full WestConnex program of works would increase traffic demand, the additional capacity within the road network provided by these projects would effectively distribute and accommodate the predicted increases in traffic. As a result, there would be a cumulative benefit of the projects, resulting in significant increases in travel speeds through the local road network, and a reduction in average travel times.

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# 7.0 Mitigation and management measures

## 7.1 Construction

The recommended measures to mitigate or manage impacts generated during the construction of the project are summarised in Table 10.

**Table 10 Construction mitigation measures**

| Impact | Detail |
|---|---|
| **Amenity** | |
| Noise and vibration | Mitigation measures specific to construction noise and vibration can be found in Chapter 12 of the EIS for this project. |
| Air quality | Mitigation measures specific to construction air quality can be found in Chapter 9 of the EIS. |
| **Traffic and access arrangements** | |
| Accessibility | Implement a community involvement plan to provide timely, regular and transparent information about changes to access and traffic conditions, details of future work programs and general construction progress throughout the construction phase of the project. Information to be provided in a variety of ways including letter box drops, media releases, internet site, signage and a hotline.<br>Mitigation measures specific to Traffic and Transport can be found in Chapter 8 of the EIS for this project. |
| Parking | Mitigation measures specific to Traffic and Transport can be found in Chapter 8 of the EIS for this project. |
| Congestion | Mitigation measures specific to Traffic and Transport can be found in Chapter 8 of the EIS for this project. |
| **Business and economic issues** | |
| Acquisition | Carry out the acquisition in accordance with the Roads and Maritime *Land Acquisition Information Guide* (Roads and Maritime, 2012) and under the terms of the *Land Acquisition (Just Terms Compensation) Act* 1991. |
| Other business impacts | Maintain of a toll free number and website to enable business owners and/or operators to receive prompt responses to their concerns, access information and view assistance measures in place during construction related work.<br>Maintain a business impact risk register to identify and manage the specific impacts associated with construction related works for individual businesses.<br>Maintain and continue the business stakeholder forum during detailed design and throughout construction to address business concerns. Further information about consultation can be found in Chapter 7 of the EIS for this project. |

## 7.2 Operation

The recommended measures to mitigate or manage impacts generated during the operation of the project are summarised in Table 11.

**Table 11 Operational mitigation measures**

| Impact | Detail |
|---|---|
| **Amenity** | |
| Noise and vibration | Mitigation measures specific to operational noise and vibration can be found in Section 12 of the EIS for this project. |
| Visual amenity | Mitigation measures specific to operational visual amenity impacts Section 14 of the EIS for this project. |
| **Traffic and access arrangements** | |
| Accessibility | Mitigation measures specific to operational traffic and transport can be found in Chapter 8 of the EIS. |
| Parking | Mitigation measures specific to operational traffic and transport can be found in Chapter 8 of the EIS. |

# 8.0 Conclusion

This assessment provides an overview of the existing social and economic environments in which the project is located and the communities and businesses impacted (positively and negatively) by the project. The potential impacts are the outcome of the interaction between the project and the existing environment and are considered from local and regional perspectives.

**Existing social environment**

The population of the study area is very diverse with varying family, housing, employment and socio-economic factors making up the individual communities within it. Those residents in the southern and western regions of the study area tend to be less mobile, more likely to belong to larger family households, live in standalone houses or dwellings and are more likely to have lower incomes and lower labour force participation. In comparison, residents closer to Sydney CBD tend to be more mobile, live in smaller households of either family or non-family arrangements, are more likely to live in apartments/units/flats, have higher incomes, higher labour force participation and more likely to hold white-collar jobs.

The study area has a wide variety of recreational and community facilities to meet the diverse needs of the study area. Recreational space is of significant importance to the region due to the considerable number of walking and cycling facilities encouraging active living for the community. Sydney Park is of regional importance as it provides both active and passive open space for the utilisation of local sporting and community clubs, thus encouraging community cohesion.

**Existing economic environment**

Businesses located in the study area employ approximately half a million people. In the southern and western regions of the study area, the majority of jobs are in the Retail Trade, Health Care/Social Assistance, Transport/Warehousing and Manufacturing industries. Conversely, Sydney LGA has a greater proportion of people employed in Financial/Insurance Services or Professional/Scientific/Technical Services.

In 2012-13, the total study area had an estimated $125.1 billion Gross Regional Product (GRP). While the majority of LGAs in the study area have relatively diverse economies, Botany Bay LGA is highly reliant on the Transport/Postal/Warehousing industries and Sydney LGA is highly reliant on Financial/Insurance services.

Businesses in the study area are generally clustered around main transport hubs, such as train stations, major bus routes or in close proximity to roads connecting with Sydney Airport or Port Botany. A large proportion of businesses in the study area are focused around manufacturing, warehousing and transport industries due to the proximity of Port Botany and Sydney Airport.

The M5 Motorway corridor plays an important role in providing the main connection for businesses in the south-west of Sydney to interstate and international markets through Port Botany and Sydney Airport. The M5 Motorway corridor is currently a highly congested corridor during peak and non-peak travel times, resulting in reduced freight efficiency and constraining economic growth. As freight tasks grow, the M5 Motorway corridor presents a major challenge in accommodating these additional freight movements, considering the limited capacity currently available on this major freight corridor.

**Potential impacts during construction**

During the construction of the project, there is the potential for a boost in the economy due to construction expenditure in the region. Local business would benefit from this expenditure through purchases made by construction businesses and associated workers to build and support the development of the project. Economic benefits associated with the project support the ongoing or improved economic vitality of the area, which is valued by the community and local government.

Employment opportunities would grow in the region through the potential increase in business customers and through the increase in demand for construction workers. The increase in demand for labour may increase wages in the region, particularly for construction workers, who would be in high demand.

It is estimated that construction expenditure would directly and indirectly contribute an estimated $1.8 billion of output, $400 million of household income, around 4,390 annual FTE jobs and $670 million in value added to the NSW economy per average year of construction.

The majority of construction activity would occur underground, which would limit the extent of amenity impacts along the corridor. Impacts would mainly arise at the location of surface works, in proximity to construction sites

and compounds and along transport routes from the construction traffic. Potential impacts to the amenity of residents, businesses and the broader community during construction may occur as a result of:

- Increases in noise and vibration associated with construction works, including increases in road traffic from construction vehicles and the construction workforce.
- Increased dust emissions associated with surface disturbance and / or the handling, transport and disposal of soil.
- Changes in visual amenity due to the introduction of construction compounds or activities.

Changes in amenity may also conflict with community values, contributing to a loss of or change in a community's sense of place, and subsequently a community's perceived identity. This is particularly relevant for the community's value of parks and open space, recreational and sporting facilities and pedestrian and cycling access.

Amenity impacts during construction of the project are discussed in more detail in Chapter 10 (Air quality), Chapter 11 (Human health), Chapter 12 (noise and vibration) and Chapter 14 (Landscape character and visual impact) of the EIS.

The project requires the acquisition or temporary occupation (lease) of 109 properties that are currently used for residential, business or community/recreational facility purposes. The project has been designed to minimise the need for land acquisition, where practical, and to limit the severance and sterilisation of private properties. An additional 50 properties that are already owned by the NSW Government (Roads and Maritime or other NSW government agencies) would also be impacted by the project.

Properties impacted by the project would comprise the following land uses:

- A total of 47 industrial and commercial (including Kogarah and Canterbury golf courses) properties would be impacted by the project by full or partial acquisition, or temporary occupation. Of the 47 properties, 18 are already owned by Roads and Maritime or other NSW Government agencies (for example, Alexandria Landfill). Of the 18 properties owned by NSW Government or other NSW Government agencies, some are not occupied or have recently been vacated.
- A total of 69 are residential properties, of which 21 are owned by Roads and Maritime. All residential properties would be subject to full acquisition and in most instances, these properties do contain residences. The exception is the partial acquisition of three private properties that has been zoned for road purposes located between residential apartments and current alignment of Euston Road.
- Additional properties include those that are vacant, within a road reserve, or contain existing roads, such as the M5 East Motorway and properties along the Princes Highway. These are within the ownership of Roads and Maritime or other NSW Government agencies.
- Four public recreational facilities (M5 Linear Park, Sydney Park, May Street Reserve and Camdenville Park).

Open space and cycle/walking paths within the M5 Linear Park (which includes Beverly Grove Park and Kingsgrove Avenue Reserve) would also be impacted as a result of the project. The majority of the M5 Linear Park is owned by Roads and Maritime.

The impact of acquisition on businesses would have both short term impacts (during construction of the project) and medium to long term impacts (during operation of the project). The economic impacts would be associated with the potential loss of employment and turnover. The temporary occupation and partial acquisition of the Kogarah Golf Course during construction and the temporary reduction of the facility from an 18-hole course to a 9-hole course may result in a reduction in turnover though the loss of memberships and a reduction in the use of club facilities.

Acquisition or temporary occupation of land during construction and any associated compensation would be undertaken in accordance with the Roads and Maritime Land Acquisition Information Guide (Roads and Maritime, 2012) and under the terms of the *Land Acquisition (Just Terms Compensation) Act 1991*. Compensation provided as part of the acquisition is anticipated to assist with loss of revenue, where reasonable, and to assist with the ongoing viability of businesses during the construction period.

Changes in access arrangements and parking during construction have the potential to impact private property and local businesses, particularly around the St Peters interchange, by reducing access for residents, customers or delivery/pick-up activities required for business operation, potentially reducing business activity and impacting turnover and employment. No reduction in on-street parking is proposed in the area of the western surface works or Arncliffe motorway operations complex.

Cumulative impacts to local and regional communities and businesses are most likely to result from the concurrent construction of other WestConnex projects and other major projects and the associated employment and expenditure in Greater Sydney. Cumulative benefits are likely to intensify employment and economic stimulus impacts in the region.

Residents, businesses and motorists are likely to experience congestion, extended periods of amenity impacts and construction fatigue due to the concurrent construction of other WestConnex projects and other major projects.

**Potential impacts during operation**

Operational expenditure was estimated to contribute a total of $44 million in output, around $10 million in household income, 116 full-time equivalent jobs and $18 million in value added per year of operation of the project. Economic benefits associated with the project support the ongoing or improved economic vitality of the area, which is valued by the community and local government.

As a significant volume of traffic currently using the Princes Highway would be diverted into the tunnel, businesses that are reliant on passing trade will be affected by the project. It has been estimated that there could be an annual reduction of around $0.4 million in output and around two full-time equivalent jobs due to loss in passing trade. This equates to a loss of 2.5 per cent of total output and full-time equivalent employment of the businesses reliant on passing trade. Reductions in passing trade would potentially be offset to some degree by improved amenity and accessibility for the businesses affected.

Due to the behavioural nature of motorists that divert along King Georges Road, Stony Creek Road and the Princes Highway south of the M5 interchange in order to avoid the proposed toll on the New M5 and M5 East Motorway, it is unlikely that this change would have a positive impact on passing trade on businesses located on these roads.

Permanent changes in amenity and health during the operation of the project would occur as a result of:

- Increases in noise and vibration associated with increases in road traffic.
- Decreased air quality associated with increased road traffic, the operation of ventilation stacks and smoke extractors.
- Changes in visual amenity due to permanent operation facilities.
- Changes in commuting behaviour and air quality resulting in changes in the health of residents and road users.

The operational noise assessment determined that a total of 145 residential receivers were identified as eligible for consideration of additional noise mitigation through at-property treatment due to predicted road noise levels in 2021 and 2031. St Peters Public School was also identified as being eligible for consideration for additional noise mitigation as noise levels are likely to exceed the internal noise criteria with windows are open. The requirement for at property mitigation would be confirmed during detailed design.

As discussed in the Technical Working Paper: Human health for the New M5 (EnRisk, 2015), changes in the urban environment associated with the project have the potential to result in a range of impacts on the health and wellbeing of the community. The potential for changes to result in impacts on health and wellbeing is complex. Changes that may occur have the potential to result in both positive and negative impacts. Positive impacts include economic benefits, changes in traffic levels in some areas, increased public open space following the closure of Alexandria Landfill and improvements in pedestrian and cycle access in some areas following completion of construction. Negative impacts may occur as a result of property acquisitions, visual changes, noise impacts and changes in access/cohesion of local areas. These may result in increased levels of stress and anxiety. In many cases the impacts identified are either short-term (associated with construction only) and/or mitigation/management measures have been identified to minimise the impacts on the community.

Access to two or three business would be permanently modified due to the project. Bunnings Mascot would have its access permanently modified to be off Bourke Road to accommodate the proposed widening of Bourke Road

and Gardeners Road. A distribution facility would also have altered access that would pose some restrictions on access currently afforded to that facility. It is not anticipated that this change in accesses would have any impacts on the viability or operation of the business. A third property may require a secondary access to be provided due to strip acquisition. This would be confirmed during detailed design and in consultation with the property owner.

Changes to parking are not anticipated to have a significant impact on business activity, as most businesses within the area can accommodate off-street parking. Additional on-street and off-street parking provided on Campbell Street as part of the project would help to alleviate impacts associated with removal of parking in other nearby areas.

The project would improve network efficiency, delivering travel time savings and provide more efficient movement of freight and commercial vehicles, thereby reducing operational costs. The project would also provide increased road capacity along the M5 East Motorway and the New M5, which is a key corridor for the movement of freight to Sydney Airport/Port Botany and commercial vehicle movements between major centres.

Cumulative impacts to the economy and businesses are most likely to result from the concurrent operation of the wider WestConnex project. The freight industry will benefit greatly by enabling the efficient movement of traffic between western and south-western Sydney and interstate and international markets through connections with the wider National Land Transport Network, Sydney Airport and Port Botany.

The project has the ability to connect residential communities with locations of employment, due to reduced congestion and decreased travel times. The project provides greater accessibility for residents of south and south-west Sydney to access Sydney Airport and Sydney CBD. This benefit is in line with community aspirations identified in Chapter 4.0 and is anticipated to have a positive impact on the local community's sense of connectedness and community cohesion.

Although the cumulative operation of the full WestConnex program of works would increase traffic demand, the additional capacity within the road network provided by these projects would effectively distribute and accommodate the predicted increases in traffic. As a result, there would be a cumulative benefit of the projects, resulting in increases in travel speeds through the local road network, and a reduction in average travel times.

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Appendix A

# Tables

# Appendix A Tables

## Social

*Population and demography*

**Table 12 Estimated Resident Population, 2008, 2012 and 2013**

| LGA | Total Population | | | Population Growth | |
|---|---|---|---|---|---|
| | 2008 | 2012 | 2013 | 5-year Growth | 1-year Growth |
| Canterbury | 139,985 | 146,729 | 148,853 | 6.3% | 1.4% |
| Hurstville | 78,036 | 83,671 | 84,859 | 8.7% | 1.4% |
| Rockdale | 100,007 | 105,227 | 106,712 | 6.7% | 1.4% |
| Marrickville | 77,141 | 81,689 | 82,523 | 7.0% | 1.0% |
| Botany Bay | 38,628 | 42,317 | 43,292 | 12.1% | 2.3% |
| Sydney | 172,685 | 187,561 | 191,918 | 11.1% | 2.3% |
| **Total Study Area** | **606,482** | **647,194** | **658,157** | **8.5%** | **1.7%** |
| Greater Sydney | 4,409,562 | 4,672,619 | 4,757,083 | 7.9% | 1.8% |
| NSW | 6,984,172 | 7,301,134 | 7,410,399 | 6.1% | 1.5% |

Source: ABS (2014), Catalogue Number 3235.0, Population by Age and Sex, Regions of Australia

**Table 13 Population Projections, 2011-2014**

| LGA | 2011 | 2016 | 2021 | 2026 | 2031 |
|---|---|---|---|---|---|
| Canterbury | 145,100 | 152,600 | 161,900 | 171,750 | 181,850 |
| Hurstville | 82,800 | 87,200 | 93,750 | 99,600 | 104,950 |
| Rockdale | 103,500 | 113,400 | 120,900 | 127,550 | 134,350 |
| Marrickville | 81,100 | 85,550 | 90,950 | 96,550 | 102,300 |
| Botany Bay | 41,500 | 45,300 | 48,150 | 52,500 | 56,050 |
| Sydney | 183,300 | 207,250 | 232,200 | 252,900 | 273,500 |
| **Total Study Area** | **637,300** | **691,300** | **747,850** | **800,850** | **853,000** |
| Greater Sydney | 4,286,300 | 4,657,600 | 5,064,150 | 5,467,000 | 5,861,850 |
| NSW | 7,218,550 | 7,708,850 | 8,230,400 | 8,739,950 | 9,228,350 |

Source: Department of Planning (2014), 2014 NSW Population Projection Data

**Table 14 Age Profile of residents, 2011 and 2006**

| LGA | Median age | Total Population | Population aged <14 years | % aged <14 years | Population aged 65+ | % aged 65+ |
|---|---|---|---|---|---|---|
| **2006** | | | | | | |
| Canterbury | 36 | 129,963 | 26,385 | 20.3% | 17,535 | 13.5% |
| Hurstville | 38 | 73,724 | 13,458 | 18.3% | 11,451 | 15.5% |
| Rockdale | 37 | 92,126 | 16,003 | 17.4% | 14,405 | 15.6% |
| Marrickville | 35 | 71,812 | 9,964 | 13.9% | 7,514 | 10.5% |
| Botany Bay | 37 | 35,993 | 6,564 | 18.2% | 5,126 | 14.2% |
| Sydney | 32 | 156,572 | 11,278 | 7.2% | 12,819 | 8.2% |
| **Total Study Area** | **n/a** | **560,190** | **83,652** | **14.9%** | **68,850** | **12.3%** |
| Greater Sydney | 35 | 4,148,574 | 806,588 | 19.4% | 506,564 | 12.2% |
| **2011** | | | | | | |
| Canterbury | 35 | 137,454 | 27,455 | 20.0% | 18,512 | 13.5% |
| Hurstville | 37 | 78,855 | 13,995 | 17.7% | 12,136 | 15.4% |
| Rockdale | 36 | 97,340 | 16,928 | 17.4% | 14,737 | 15.1% |
| Marrickville | 36 | 76,500 | 11,233 | 14.7% | 7,984 | 10.4% |
| Botany Bay | 37 | 39,356 | 7,140 | 18.1% | 5,652 | 14.4% |
| Sydney | 32 | 169,505 | 12,041 | 7.1% | 13,366 | 7.9% |
| **Total Study Area** | **n/a** | **599,010** | **88,792** | **14.8%** | **72,387** | **12.1%** |
| Greater Sydney | 36 | 4,429,034 | 846,114 | 19.1% | 565,345 | 12.8% |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 15 Cultural Diversity, 2011**

| LGA | Aboriginal and Torres Strait Islander Population | Overseas born population | Population that speaks a language other than English at home | Total Population |
|---|---|---|---|---|
| Canterbury | 0.6% | 48.1% | 63.9% | 137,454 |
| Hurstville | 0.6% | 41.8% | 48.9% | 78,855 |
| Rockdale | 0.6% | 43.6% | 54.3% | 97,340 |
| Marrickville | 1.5% | 34.1% | 30.7% | 76,500 |
| Botany Bay | 1.6% | 42.2% | 44.1% | 39,356 |
| Sydney | 1.3% | 42.6% | 29.9% | 169,505 |
| **Total Study Area** | **1.0%** | **42.8%** | **45.2%** | **599,010** |
| Greater Sydney | 1.2% | 33.9% | 32.1% | 4,429,034 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 16 Need for assistance, 2011**

| LGA | Has need for assistance | Does not have need for assistance | Need for assistance not stated | Total |
|---|---|---|---|---|
| Canterbury | 5.3% | 87.4% | 7.3% | 137,450 |
| Hurstville | 4.7% | 90.8% | 4.4% | 78,855 |
| Rockdale | 5.3% | 88.2% | 6.6% | 97,339 |
| Marrickville | 4.3% | 88.1% | 7.6% | 76,500 |
| Botany Bay | 5.0% | 88.5% | 6.5% | 39,358 |
| Sydney | 2.5% | 83.8% | 13.7% | 169,505 |
| **Total Study Area** | **4.3%** | **87.1%** | **8.6%** | **599,007** |
| Greater Sydney | 4.4% | 89.7% | 6.0% | 4,391,674 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

*Families and housing*

**Table 17 Population Mobility, 2011**

| LGA | Population living at other address | |
|---|---|---|
| | 1-year ago | 5-years ago |
| Canterbury | 11.6% | 33.4% |
| Hurstville | 12.4% | 35.8% |
| Rockdale | 12.5% | 36.2% |
| Marrickville | 16.9% | 43.9% |
| Botany Bay | 12.3% | 36.6% |
| Sydney | 24.7% | 55.7% |
| **Total Study Area** | **16.3%** | **42.2%** |
| Greater Sydney | 13.6% | 37.2% |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 18 Dwelling Structure, 2011**

| LGA | Separate House | Semi-detached House | Flat, Unit or Apartment | Other Dwelling | Total Occupied Dwellings |
|---|---|---|---|---|---|
| Canterbury | 52.5% | 10.2% | 36.5% | 0.5% | 45,927 |
| Hurstville | 59.0% | 12.3% | 28.2% | 0.5% | 27,546 |
| Rockdale | 49.4% | 12.7% | 36.9% | 0.8% | 34,411 |
| Marrickville | 33.5% | 27.5% | 37.4% | 1.3% | 29,976 |
| Botany Bay | 39.5% | 14.6% | 45.1% | 0.5% | 14,120 |
| Sydney | 4.2% | 21.2% | 73.6% | 0.3% | 73,171 |
| **Total Study Area** | **33.8%** | **17.0%** | **48.3%** | **0.6%** | **225,151** |
| Greater Sydney | 60.9% | 12.8% | 25.8% | 0.5% | 1,521,398 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 19 Household composition, 2011**

| LGA | Family Households | Non-family Households | Total Households | Average household size |
|---|---|---|---|---|
| Canterbury | 75.4% | 24.6% | 45,928 | 2.8 |
| Hurstville | 75.1% | 24.9% | 27,547 | 2.8 |
| Rockdale | 71.8% | 28.2% | 34,408 | 2.7 |
| Marrickville | 60.4% | 39.6% | 29,977 | 2.3 |
| Botany Bay | 70.7% | 29.3% | 14,119 | 2.6 |
| Sydney | 45.9% | 54.1% | 73,170 | 1.9 |
| **Total Study Area** | **62.9%** | **37.1%** | **225,149** | **n/a** |
| Greater Sydney | 73.1% | 26.9% | 1,521,396 | 2.7 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 20 Family type, 2011**

| LGA | Couple Family with no children | Couple family with children | One parent family with children | Other family | Total Families |
|---|---|---|---|---|---|
| Canterbury | 29.0% | 51.2% | 17.6% | 2.2% | 36,216 |
| Hurstville | 33.1% | 49.6% | 15.3% | 2.0% | 21,620 |
| Rockdale | 35.3% | 46.6% | 15.6% | 2.5% | 25,844 |
| Marrickville | 41.9% | 39.1% | 15.8% | 3.2% | 18,622 |
| Botany Bay | 31.3% | 48.2% | 17.6% | 2.8% | 10,371 |
| Sydney | 61.6% | 22.3% | 11.2% | 4.9% | 33,991 |
| **Total Study Area** | **40.1%** | **41.7%** | **15.2%** | **3.0%** | **146,664** |
| Greater Sydney | 33.5% | 48.9% | 15.7% | 1.9% | 1,152,551 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 21 Housing tenure, 2011**

| LGA | Owned outright | Owned with a mortgage | Rented | Other tenure type | Total Occupied Private Dwellings | Median mortgage repayment ($/month) | Median rental cost ($/week) |
|---|---|---|---|---|---|---|---|
| Canterbury | 30.7% | 28.5% | 36.5% | 0.6% | 45,928 | $2,000 | $300 |
| Hurstville | 36.1% | 32.5% | 28.4% | 0.6% | 27,547 | $2,167 | $350 |
| Rockdale | 34.5% | 30.5% | 31.4% | 0.5% | 34,410 | $2,167 | $370 |
| Marrickville | 23.4% | 30.8% | 43.0% | 0.5% | 29,976 | $2,485 | $370 |
| Botany Bay | 28.2% | 30.8% | 37.6% | 0.6% | 14,121 | $2,500 | $330 |
| Sydney | 14.1% | 23.2% | 59.8% | 0.6% | 73,172 | $2,539 | $465 |
| **Total Study Area** | **25.4%** | **28.1%** | **43.3%** | **0.6%** | **225,154** | **N/A** | **N/A** |
| Greater Sydney | 30.4% | 34.8% | 31.6% | 0.8% | 1,521,398 | $2,167 | $351 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

*Socio-economic index for areas*

**Table 22 Socio-economic index for areas (SEIFA), 2011**

| LGA | Index of Relative Socio-economic Advantage and Disadvantage | | Index of Economic Resources | |
|---|---|---|---|---|
| | Score | Decile | Score | Decile |
| Canterbury | 939 | 4 | 933 | 2 |
| Hurstville | 1,018 | 8 | 994 | 6 |
| Rockdale | 1,001 | 8 | 978 | 5 |
| Marrickville | 1,043 | 9 | 969 | 4 |
| Botany Bay | 985 | 7 | 962 | 4 |
| Sydney | 1,051 | 9 | 894 | 1 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Socio-economic Index for Areas

*Labour force and household income*

**Table 23 Median incomes, 2011**

| LGA | Median total personal income ($/weekly) | Median total family income ($/weekly) | Median total household income ($/weekly) | Low Income Households (less than $399/week) | Low Income Households (less than $599/week) |
|---|---|---|---|---|---|
| Canterbury | $430 | $1,149 | $1,029 | 14.5% | 25.4% |
| Hurstville | $540 | $1,475 | $1,284 | 12.0% | 20.5% |
| Rockdale | $555 | $1,443 | $1,276 | 11.9% | 20.5% |
| Marrickville | $772 | $1,964 | $1,605 | 9.8% | 16.3% |
| Botany Bay | $575 | $1,488 | $1,245 | 14.4% | 22.8% |
| Sydney | $888 | $2,273 | $1,639 | 13.8% | 19.0% |
| **Total Study Area** | **n/a** | **n/a** | **n/a** | **12.9%** | **20.6%** |
| Greater Sydney | $619 | $1,683 | $1,447 | 10.7% | 18.2% |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 24 Workforce participation, 2011**

| LGA | Employed | | | | Unemployed | Total Labour Force |
|---|---|---|---|---|---|---|
| | Full-time | Part-time | Away from work | Hours not stated | | |
| Canterbury | 57.6% | 27.9% | 3.0% | 3.3% | 8.2% | 109,996 |
| Hurstville | 61.2% | 27.3% | 3.2% | 2.3% | 6.1% | 64,859 |
| Rockdale | 61.6% | 26.5% | 3.4% | 2.5% | 5.9% | 80,411 |
| Marrickville | 64.9% | 24.6% | 3.6% | 1.6% | 5.3% | 65,268 |
| Botany Bay | 62.9% | 26.0% | 3.6% | 2.2% | 5.3% | 32,212 |
| Sydney | 68.1% | 21.8% | 3.0% | 1.3% | 5.8% | 157,459 |
| **Total Study Area** | **63.5%** | **25.0%** | **3.2%** | **2.1%** | **6.2%** | **510,205** |
| Greater Sydney | 62.1% | 26.7% | 3.4% | 2.1% | 5.7% | 3,548,458 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 25 Industry of employment, 2011**

| Industry | Canterbury | Hurstville | Rockdale | Marrickville | Botany Bay | Sydney | Total Study Area | Greater Sydney |
|---|---|---|---|---|---|---|---|---|
| Agriculture, forestry and fishing | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.4% |
| Mining | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.2% | 0.1% | 0.2% |
| Manufacturing | 8.8% | 8.1% | 7.1% | 5.3% | 7.3% | 3.6% | 6.1% | 8.5% |
| Electricity, gas, water and waste services | 0.6% | 0.9% | 0.7% | 0.6% | 0.6% | 0.5% | 0.6% | 0.9% |
| Construction | 7.6% | 6.2% | 6.2% | 4.2% | 5.7% | 3.1% | 5.1% | 7.1% |
| Wholesale trade | 5.1% | 5.5% | 4.8% | 3.8% | 5.3% | 3.8% | 4.5% | 5.3% |
| Retail trade | 10.9% | 9.9% | 10.0% | 7.6% | 10.1% | 7.6% | 9.0% | 9.8% |
| Accommodation and food services | 8.6% | 7.3% | 8.6% | 6.6% | 7.4% | 10.0% | 8.5% | 6.2% |
| Transport, postal and warehousing | 8.0% | 7.5% | 9.4% | 4.1% | 10.0% | 3.1% | 6.1% | 5.3% |
| Information media and telecommunications | 2.3% | 2.4% | 2.5% | 5.9% | 2.4% | 6.1% | 4.1% | 3.0% |
| Financial and insurance services | 5.2% | 7.3% | 6.5% | 6.5% | 5.5% | 10.1% | 7.5% | 6.6% |
| Rental, hiring and real estate services | 1.5% | 1.8% | 1.7% | 1.4% | 1.9% | 1.8% | 1.7% | 1.8% |
| Professional, scientific and technical services | 6.2% | 8.6% | 7.8% | 12.2% | 6.9% | 16.8% | 11.1% | 9.6% |
| Administrative and support services | 4.1% | 3.8% | 4.4% | 3.9% | 4.0% | 4.4% | 4.2% | 3.5% |
| Public administration and safety | 5.1% | 5.4% | 5.4% | 7.1% | 6.8% | 5.6% | 5.7% | 5.6% |
| Education and training | 6.2% | 7.3% | 5.8% | 10.9% | 6.3% | 7.3% | 7.3% | 7.6% |
| Health care and social assistance | 10.3% | 10.4% | 10.5% | 11.0% | 11.2% | 7.9% | 9.7% | 10.9% |
| Arts and recreation services | 1.3% | 1.4% | 1.5% | 3.0% | 2.0% | 3.0% | 2.2% | 1.6% |
| Other services | 4.4% | 3.5% | 3.9% | 3.5% | 3.7% | 2.8% | 3.5% | 3.7% |
| Inadequately described/Not stated | 3.6% | 2.6% | 3.1% | 2.1% | 2.8% | 2.2% | 2.7% | 2.6% |
| **Total** | **54,664** | **36,434** | **44,953** | **41,880** | **18,399** | **96,798** | **293,128** | **2,063,271** |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 26 Occupation, 2011**

| Industry | Canterbury | Hurstville | Rockdale | Marrickville | Botany Bay | Sydney | Total Study Area | Greater Sydney |
|---|---|---|---|---|---|---|---|---|
| Managers | 9.6% | 11.3% | 11.1% | 13.8% | 11.0% | 16.5% | 13.0% | 13.3% |
| Professionals | 19.0% | 23.9% | 21.5% | 35.9% | 19.6% | 38.8% | 29.0% | 25.5% |
| Technicians and trades workers | 14.2% | 12.6% | 12.7% | 9.8% | 12.9% | 7.7% | 10.9% | 12.2% |
| Community and personal service workers | 9.4% | 9.1% | 9.3% | 8.2% | 10.2% | 9.2% | 9.2% | 8.8% |
| Clerical and administrative workers | 15.5% | 18.2% | 17.1% | 14.8% | 17.8% | 13.1% | 15.3% | 16.2% |
| Sales workers | 9.9% | 9.2% | 9.8% | 6.9% | 9.9% | 7.4% | 8.6% | 9.0% |
| Machinery operators and drivers | 8.6% | 5.9% | 6.8% | 3.3% | 7.8% | 1.5% | 4.8% | 5.7% |
| Labourers | 11.4% | 7.7% | 9.5% | 5.6% | 8.7% | 3.9% | 7.2% | 7.3% |
| Inadequately described / Not stated | 2.6% | 2.0% | 2.3% | 1.5% | 2.0% | 1.8% | 2.0% | 2.0% |
| **Total** | **54,664** | **36,436** | **44,953** | **41,876** | **18,396** | **96,796** | **293,121** | **2,063,269** |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Economic**

*Workforce characteristics*

| Industry | Canterbury | Hurstville | Rockdale | Marrickville | Botany Bay | Sydney | Total Study Area | Greater Sydney |
|---|---|---|---|---|---|---|---|---|
| Agriculture, forestry and fishing | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% | 0.0% | 0.1% | 0.4% |
| Mining | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% | 0.2% | 0.2% |
| Manufacturing | 10.7% | 8.3% | 6.6% | 15.0% | 11.2% | 2.5% | 4.5% | 8.8% |
| Electricity, gas, water and waste services | 0.1% | 0.4% | 0.3% | 0.2% | 0.5% | 0.8% | 0.7% | 0.9% |
| Construction | 7.9% | 6.9% | 5.8% | 5.8% | 4.3% | 2.5% | 3.3% | 5.4% |
| Wholesale trade | 7.3% | 7.2% | 2.8% | 8.5% | 8.5% | 2.8% | 3.9% | 5.5% |
| Retail trade | 13.6% | 12.9% | 14.0% | 11.3% | 7.0% | 5.3% | 6.7% | 10.1% |
| Accommodation and food services | 7.4% | 6.5% | 8.2% | 6.6% | 5.2% | 6.4% | 6.4% | 6.3% |
| Transport, postal and warehousing | 5.9% | 4.0% | 13.5% | 6.3% | 41.7% | 3.4% | 7.3% | 5.2% |
| Information media and telecommunications | 0.9% | 0.9% | 0.8% | 2.2% | 1.0% | 6.6% | 5.2% | 3.2% |
| Financial and insurance services | 1.7% | 6.8% | 1.5% | 1.5% | 1.1% | 19.7% | 15.3% | 7.0% |
| Rental, hiring and real estate services | 1.6% | 2.0% | 2.3% | 1.5% | 1.9% | 2.1% | 2.0% | 1.9% |
| Professional, scientific and technical services | 4.1% | 6.5% | 5.3% | 7.5% | 3.4% | 18.6% | 15.2% | 10.2% |
| Administrative and support services | 2.6% | 3.1% | 4.6% | 2.3% | 3.2% | 4.4% | 4.1% | 3.2% |
| Public administration and safety | 6.0% | 5.1% | 9.9% | 4.7% | 3.2% | 7.8% | 7.2% | 6.0% |
| Education and training | 8.8% | 8.4% | 7.9% | 8.8% | 1.2% | 5.4% | 5.6% | 8.0% |
| Health care and social assistance | 13.6% | 13.5% | 9.9% | 8.8% | 2.8% | 5.4% | 6.2% | 11.3% |
| Arts and recreation services | 1.3% | 1.2% | 1.1% | 2.3% | 0.4% | 2.5% | 2.1% | 1.6% |
| Other services | 4.9% | 5.1% | 4.3% | 5.3% | 2.3% | 2.6% | 2.9% | 3.7% |
| Inadequately described/Not stated | 1.3% | 1.1% | 1.2% | 1.3% | 1.1% | 1.0% | 1.0% | 1.2% |
| **Total** | 23,826 | 19,361 | 21,298 | 23,262 | 44,640 | 395,338 | 527,725 | 1,874,115 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Working Population Profile

**Table 27 Workforce by occupation, 2011**

| Industry | Canterbury | Hurstville | Rockdale | Marrickville | Botany Bay | Sydney | Total Study Area | Greater Sydney |
|---|---|---|---|---|---|---|---|---|
| Managers | 12.4% | 12.7% | 11.5% | 14.4% | 13.8% | 17.2% | 16.2% | 14.0% |
| Professionals | 19.0% | 20.9% | 17.0% | 21.9% | 16.7% | 38.6% | 33.6% | 27.0% |
| Technicians and trades workers | 13.6% | 12.5% | 13.3% | 14.2% | 13.4% | 6.5% | 8.3% | 10.9% |
| Community and personal service workers | 10.7% | 10.2% | 11.2% | 8.6% | 11.7% | 6.2% | 7.3% | 8.8% |
| Clerical and administrative workers | 14.4% | 18.7% | 17.5% | 12.8% | 16.8% | 20.2% | 19.1% | 17.1% |
| Sales workers | 11.3% | 12.7% | 12.9% | 8.9% | 9.7% | 5.9% | 7.2% | 9.2% |
| Machinery operators and drivers | 8.8% | 5.2% | 7.3% | 8.8% | 9.0% | 1.4% | 3.1% | 5.4% |
| Labourers | 8.8% | 6.2% | 8.5% | 9.4% | 7.7% | 2.8% | 4.2% | 6.4% |
| Inadequately described / Not stated | 1.0% | 0.9% | 1.0% | 1.0% | 1.2% | 1.2% | 1.2% | 1.1% |
| **Total** | **23,826** | **19,361** | **21,298** | **23,262** | **44,640** | **395,338** | **527,725** | **1,874,115** |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Working Population Profile

*Business and industry*

**Table 28 Gross Regional Product and Gross State Product, 2012-13**

| Industry | Canterbury | Hurstville | Rockdale | Marrickville | Botany Bay | Sydney | Greater Sydney | NSW |
|---|---|---|---|---|---|---|---|---|
| Agriculture, forestry and fishing | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 1.7% |
| Mining | 0.1% | 0.0% | 0.1% | 0.1% | 0.0% | 0.5% | 0.6% | 2.9% |
| Manufacturing | 9.8% | 7.7% | 6.0% | 13.1% | 10.3% | 1.8% | 7.6% | 8.0% |
| Electricity, gas, water and waste services | 0.3% | 0.9% | 0.7% | 0.4% | 1.1% | 1.4% | 2.0% | 2.6% |
| Construction | 8.0% | 7.0% | 5.8% | 5.6% | 4.3% | 2.3% | 5.1% | 5.5% |
| Wholesale trade | 7.4% | 7.4% | 2.8% | 8.2% | 8.7% | 2.0% | 5.4% | 4.6% |
| Retail trade | 6.0% | 5.8% | 6.2% | 4.8% | 3.1% | 2.0% | 4.3% | 4.6% |
| Accommodation and food services | 3.0% | 2.6% | 3.3% | 2.5% | 2.1% | 2.4% | 2.5% | 2.8% |
| Transport, postal and warehousing | 6.4% | 4.3% | 14.6% | 6.4% | 45.4% | 2.9% | 5.3% | 5.1% |
| Information media and telecommunications | 1.5% | 1.6% | 1.3% | 3.6% | 1.7% | 9.0% | 5.5% | 4.4% |
| Financial and insurance services | 3.3% | 13.4% | 2.9% | 2.8% | 2.3% | 37.1% | 16.2% | 13.0% |
| Rental, hiring and real estate services | 2.5% | 3.1% | 3.6% | 2.3% | 3.1% | 3.0% | 3.0% | 2.9% |
| Professional, scientific and technical services | 3.8% | 6.2% | 4.9% | 6.7% | 3.2% | 14.0% | 9.6% | 8.1% |
| Administrative and support services | 3.1% | 3.7% | 5.4% | 2.5% | 3.7% | 4.6% | 3.8% | 3.5% |
| Public administration and safety | 4.9% | 4.2% | 8.2% | 3.7% | 2.6% | 5.3% | 4.9% | 5.3% |
| Education and training | 5.2% | 5.0% | 4.6% | 5.0% | 0.7% | 2.5% | 4.6% | 5.1% |
| Health care and social assistance | 7.6% | 7.6% | 5.5% | 4.7% | 1.6% | 2.5% | 6.1% | 6.8% |
| Arts and recreation services | 0.9% | 0.8% | 0.7% | 1.5% | 0.3% | 1.6% | 1.2% | 1.1% |
| Other services | 2.5% | 2.7% | 2.2% | 2.6% | 1.2% | 1.2% | 1.9% | 2.0% |
| Ownership of dwellings | 23.7% | 15.7% | 21.2% | 23.3% | 4.5% | 3.9% | 10.2% | 9.9% |
| **Gross Sector Value Add** | $3,783.1 | $3,024.8 | $3,379.0 | $3,858.4 | $6,992.8 | $90,799.6 | $308,697.0 | $425,947.0 |
| *Taxes Less Subsidies* | $448.4 | $358.5 | $400.5 | $457.3 | $828.8 | $10,762.4 | $36,589.5 | $50,487.0 |
| **Gross Regional Product** | $4,231.5 | $3,383.4 | $3,779.6 | $4,315.7 | $7,821.6 | $101,562.0 | $345,286.5 | $476,434.0 |

Source: AECOM (2014), GRP Model

## Travel patterns

**Table 29 Vehicle ownership, 2011**

| LGA | Number of vehicles per household | | | Total Dwellings |
|---|---|---|---|---|
| | No vehicles | One vehicle | Two or more vehicles | |
| Canterbury | 15.5% | 42.0% | 38.2% | 45,927 |
| Hurstville | 12.8% | 41.0% | 43.3% | 27,548 |
| Rockdale | 13.6% | 44.2% | 38.8% | 34,407 |
| Marrickville | 20.9% | 49.8% | 26.4% | 29,977 |
| Botany Bay | 17.2% | 42.1% | 36.9% | 14,120 |
| Sydney | 38.7% | 44.4% | 13.9% | 73,174 |
| **Total Study Area** | **23.2%** | **44.0%** | **29.4%** | **225,153** |
| Greater Sydney | 12.1% | 38.4% | 46.5% | 1,521,397 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

**Table 30 Travel to work, 2011**

| LGA | Train | Bus | Car (driver or passenger) | Bicycle | Walked only | Other | Total One Method |
|---|---|---|---|---|---|---|---|
| Canterbury | 18.4% | 3.3% | 71.8% | 0.5% | 3.0% | 3.1% | 44,755 |
| Hurstville | 25.5% | 1.4% | 67.3% | 0.3% | 3.1% | 2.3% | 29,791 |
| Rockdale | 22.4% | 2.7% | 68.1% | 0.4% | 3.6% | 2.8% | 36,494 |
| Marrickville | 25.7% | 11.1% | 48.9% | 4.2% | 6.9% | 3.2% | 33,401 |
| Botany Bay | 4.5% | 16.1% | 68.1% | 1.6% | 6.5% | 3.1% | 15,352 |
| Sydney | 14.9% | 15.9% | 30.4% | 3.6% | 30.5% | 4.6% | 80,360 |
| **Total Study Area** | **18.9%** | **9.1%** | **53.4%** | **2.1%** | **13.1%** | **3.5%** | **240,153** |
| Greater Sydney | 11.4% | 6.5% | 72.6% | 0.9% | 5.1% | 3.5% | 1,654,036 |

Source: Australian Bureau of Statistics (2012), Census of Housing and Population, Community Profiles

Appendix B

# Community Facilities Inventory

# Appendix B Community Facilities Inventory

**Table 31 Educational facilities**

| Type | Facility and location |
|---|---|
| **Western, Kingsgrove Road and Bexley Road surface works** | |
| Child Care | Cheeky Monkeys Day Care Centre,<br>607 Homer Street, Kingsgrove |
| | Kingsgrove Kindergarten,<br>77A Shaw Street, Kingsgrove |
| | Clemton Park Child Care Centre,<br>185 Bexley Road, Kingsgrove |
| | Kids Oasis,<br>147 Wolli Street, Kingsgrove |
| | Booth College Early Education Centre,<br>120 Kingsland Road, Bexley North |
| | Hilltop Kids Long Day Care Centre,<br>61 Barnsbury Grove, Bardwell Park |
| | Kingsgrove World of Learning<br>4 Richlands Street, Kingsgrove |
| | Hurstville City Council Family Day Care,<br>70 Vanessa Street, Beverly Hills |
| | Daffodils Family Day Care<br>10 Rogers Street, Roselands |
| | Barfa Bear Child Care Centre<br>2 Alkoomie Street, Beverly Hills |
| | Cubbyhouse Before and After Care,<br>1-3 Shorter Avenue, Beverly Hills |
| | Active Kids,<br>85 Penshurst Road, Narwee |
| | Footsteps Early Learning Centre<br>77 Ponyara Road, Beverly Hills |
| Primary School | Bexley North Public School,<br>116 Kingsland Road, Bexley North |
| | Clemton Park Public School,<br>185 Bexley Road, Earlwood |
| | Beverly Hills North Public School,<br>King Georges Road, Beverly Hills |
| | Regina Coeli School,<br>Tarrilli Street, Beverly Hills |
| | McCallums Hill Public School<br>McCallum Street, Roselands |
| High School | Kingsgrove North High School<br>St Albans Road, Kingsgrove |
| | Beverly Hills Girls High School,<br>Broad Arrow Road, Beverly Hills |
| | St Ursula's College<br>69 Caroline Street, Kingsgrove |
| Tertiary Education | Booth College,<br>32A Barnsley Grove, North Bexley |

| Type | Facility and location |
|---|---|
| **St Peters interchange and local road upgrades** | |
| Child Care | Betty Spears Childcare Centre,<br>1A Gannon Street, Tempe |
| | Tillman Park Early Learning Centre<br>79 Unwins Bridge Road, Tempe |
| | FROBEL Alexandria<br>7105/177-219 Mitchell Road, Alexandria |
| | Early Achievers Child Care Centre,<br>290 Edgeware Road, Newtown |
| | Little Learning School Alexandria,<br>95 Burrows Road, Alexandria |
| | OZEDUCATION Early Learning Centre,<br>6-8 Huntley Street, Alexandria |
| | Building Blocks Early Childhood,<br>2/140 Bourke Road, Alexandria |
| | Alexandria Early Education,<br>140 Bourke Street, Alexandria |
| | Lees Learning Centre,<br>61-67 O'Riordan Street, Alexandria |
| | Active Kids,<br>18 Church Street, Mascot |
| | Aero Kids Early Learning Centre<br>2/247 Coward Street, Mascot |
| | KU Children's Services<br>10 Bourke Road, Mascot |
| | Building Blocks Early Childhood Centre,<br>15 Bourke Street, Mascot |
| | The Joey Club – Sydney<br>14/16 Bourke Road, Mascot |
| Primary School | Camdenville Public School<br>Laura Street, Newtown |
| | St Peters Public School<br>Church Street, St Peters |
| | Newtown Public School<br>1 Norfolk Street, Newtown |
| High School | Newtown High School of the Performing Arts<br>King Street, Newtown |
| | Tempe High School,<br>Unwins Bridge Road, Tempe |
| Tertiary Education | Sydney TAFE Design Centre Enmore,<br>110 Edgeware Road, Enmore |

| Type | Facility and location |
|---|---|
| **Arncliffe surface works** | |
| Child Care | Busy Bee Long Day Child Care Centre,<br>3 Marinea Street, Arncliffe |
| | Do Re Mi Long Day Care Centre,<br>1/42 Spring Street, Arncliffe |
| Primary School | Arncliffe Public School,<br>168 Princes Highway, Arncliffe |
| | St Francis Xavier's Catholic Primary School,<br>Forest Road, Arncliffe |

**Table 32 Sporting, recreational and cultural facilities**

| Type | Facility and location |
|---|---|
| **Western, Kingsgrove Road and Bexley Road surface works** | |
| Sporting Facilities | Roselands Aquatic Centre,<br>Centre Avenue, Roselands |
| | Kingsgrove Sports Centre,<br>179 Kingsgrove Road, Kingsgrove |
| | Kingsgrove Avenue Reserve - sporting fields |
| | Gilchrist Park – sporting fields |
| | Beaumont Park – sporting fields |
| | John Mountford Reserve – tennis courts |
| | Coolabah Reserve – tennis courts |
| | Clemton Park – sporting fields |
| | Canterbury Golf Course,<br>Beverly Hills |
| Places of Worship | Regina Coeli Catholic Church,<br>70 Ponyara Road, Beverly Hills |
| | Beverly Hills Uniting Church,<br>82 Ponyara Road, Beverly Hills |
| | Beverly Hills Kingsgrove Anglican Church,<br>119 Morgan Street, Beverly Hills |
| | Anglican Church of Australia,<br>52 McCallum Street, Roselands |
| | Beverly Hills Chinese Baptist Church,<br>192 Stoney Creek Road, Beverly Hills |
| | Greek Free Church,<br>51-57 Kings Way, Kingsgrove |
| | Anglican Church of Australia<br>3 Paterson Avenue, Kingsgrove |
| | Our Lady of Fatima Church<br>89 Shaw Street, Kingsgrove |
| | Uniting Church in Australia,<br>44A Earlwood Crescent, Bardwell Park |

| Type | Facility and location |
|---|---|
| | Vietnamese Evangelical Church in Australia,<br>207 Stony Creek Road, Kingsgrove |
| | Bexley North Anglican Church<br>27 Carrisbrook Avenue, Bexley North |
| | South-West Chinese Christian Church<br>4 Morgan Street, Kingsgrove |
| | Assembleia de Deus,<br>125 Kingsgrove Road, Kingsgrove |
| | Clemton Park Baptist Church,<br>9-11 Shackel Avenue, Kingsgrove |
| | St Bernadette's Church,<br>William Street, |
| Community Halls | Kingsgrove and Bexley North Community Centre,<br>54 Shaw Street, Bexley North |
| Library | Marrickville Council Library<br>39 Unwins Bridge Road, Sydenham |
| **St Peters Interchange and local road upgrades** | |
| Sporting Facilities | Camdenville Park – sporting fields |
| | Simpson Park – sporting fields |
| | Sydney Park:<br>- Sporting grounds<br>- Walking and cycling tracks<br>- Sydney Park Cycling Centre |
| Places of Worship | Uniting Church in Australia Tempe,<br>Lymerston Street, Tempe |
| | St Peters Anglican Church,<br>187 Princes Highway, St Peters |
| | Resolved Church,<br>1 Bedford Street, Newtown |
| | Newtown Mission,<br>280A King Street, Newtown |
| | Hillsong Church Alexandria,<br>2/196 Bourke Road, Alexandria |
| Community Halls | Sydney Park Pavilion,<br>Euston Road, St Peters |
| | Sydney Park Community Room,<br>Sydney Park Road, St Peters |
| | Newtown Neighbourhood Centre,<br>1 Bedford Street, Newtown |
| Library | Rockdale City Library – Bexley North Branch,<br>24 Shaw Street, Bexley North |

| Type | Facility and location |
|---|---|
| **Arncliffe surface works** | |
| Sporting facilities | Kogarah Golf Course,<br>19 Marsh Street, Arncliffe |
| | Barton Park Driving Range<br>210 W Botany Street, Arncliffe |
| | Saint George Soccer Stadium,<br>Banksia |
| | Barton Park – Bestic Street Cycleway |
| | Banksia Field – sporting fields, baseball diamond |
| | Cahill Park – sporting facilities |
| | Arncliffe Scots Sports and Social Club |
| | St George Rowing Club |

WestConnex