

## 4. Existing social and economic environment

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

### 4.1.1 Regional context

The project extends from the Liverpool LGA in the south to Penrith LGA in the north and west. This section provides a brief overview of each of the LGAs within the project study area.

### 4.1.2 Penrith local government area

Penrith LGA is located about 50 km west of central Sydney and covers an area of about 404 km<sup>2</sup>. The LGA is bounded by Hawkesbury LGA to the north, Blacktown and Fairfield LGAs to the east, Liverpool and Wollondilly LGAs to the south and Blue Mountains LGA to the west (<http://profile.id.com.au/penrith/about>).

The LGA had an estimated residential population of about 197,922 people in 2015. Over the five and 10 years to 2015, average population growth in the Penrith LGA was below or marginally above the NSW average (Commonwealth of Australia, 2016a). Over the next 15 years, the population of the LGA is predicted to grow at a rate above the NSW average.

Penrith comprises predominantly rural land uses, with about 80 per cent of the LGA comprising rural and rural-residential uses. Agricultural uses include dairying, poultry farming, hobby farming, orcharding, market gardening and horse breeding. Urban uses in the LGA comprise mainly residential uses, with some commercial and industrial areas. Major commercial centres in the LGA are located at Penrith, west of the project and St Marys, east of the project (<http://profile.id.com.au/penrith/about>). The LGA also accommodates the Defence Establishment Orchard Hill, which is used for the storage of munitions as well as weapons training. The Defence Establishment Orchard Hill site is located at The Northern Road and covers an area of about 1,740 hectares (Commonwealth of Australia, 2013b). In addition to buildings and structures, land within the Defence Establishment Orchard Hills includes areas used for recreation, conservation, water storage (dams) and open space.

The LGA has a number of major education facilities including the University of Western Sydney, the Western Sydney Institute, and TAFE NSW Western Sydney Institute Penrith Campus. Major hospitals in the Penrith LGA include the Nepean Public Hospital and Nepean Private Hospital, which are located north of the project. Penrith Lakes Regional Park is a key focus of sport, recreation and leisure facilities for local and regional communities, and accommodates a range of local, regional and international level facilities such as the Sydney International Regatta Centre, Penrith Whitewater Stadium and Nepean Aquatic Centre. Penrith Stadium and the Penrith Panthers Leagues Club also provide sporting, recreation and leisure facilities for local and regional communities.

The Penrith LGA is serviced by a number of major roads including the M4 Motorway, M7 Motorway, the Great Western Highway and The Northern Road. Other key transport routes serving the LGA include the Western railway line, which connects central Sydney to Emu Plains and further to the Blue Mountains.

### 4.1.3 Liverpool local government area

The Liverpool LGA is located approximately 27 km west of central Sydney and covers an area of about 305 km<sup>2</sup>. In 2015, the LGA had an estimated residential population of about 204,594 people. Over the 10 years to 2015, the LGA's population grew by about 37,122 people or 22.2 per cent, compared to about 13.8 per cent in NSW over the same period (Commonwealth of Australia, 2016a).

Land uses in the Liverpool LGA include a mix of rural and urban uses, including residential, commercial and industrial uses. The LGA also accommodates Department of Defence uses including the Holsworthy Barracks.

The barracks is part of the Holsworthy military reserve, which covers an area of nearly 20,000 hectares (Commonwealth of Australia, 2013c).

The LGA has experienced rapid urban development over the past two decades, which is expected to continue (<http://profile.id.com.au/liverpool/about>). The Liverpool CBD is the key commercial centre for the region, offering a range of retail, business and commercial uses.

The LGA accommodates a number of major community services and facilities, including education facilities such as the TAFE NSW South Western Sydney Institute (Liverpool and Miller Colleges); and major health care services at Liverpool Hospital. A number of state and regional level sport and recreation facilities are also located in the LGA, including Warwick Farm Racecourse, Western Sydney Parklands, Sydney International Shooting Centre, Eastern Creek International Raceway and Sydney International Equestrian Centre.

Liverpool LGA is serviced by a number of major roads including the M5 Motorway, M7 Motorway, the Cumberland Highway and The Northern Road. Other key transport routes include the Bankstown, Cumberland and South railway lines and the Liverpool to Parramatta Transitway (<http://profile.id.com.au/liverpool/about>).

## 4.2 Land use

### 4.2.1 Land use zoning

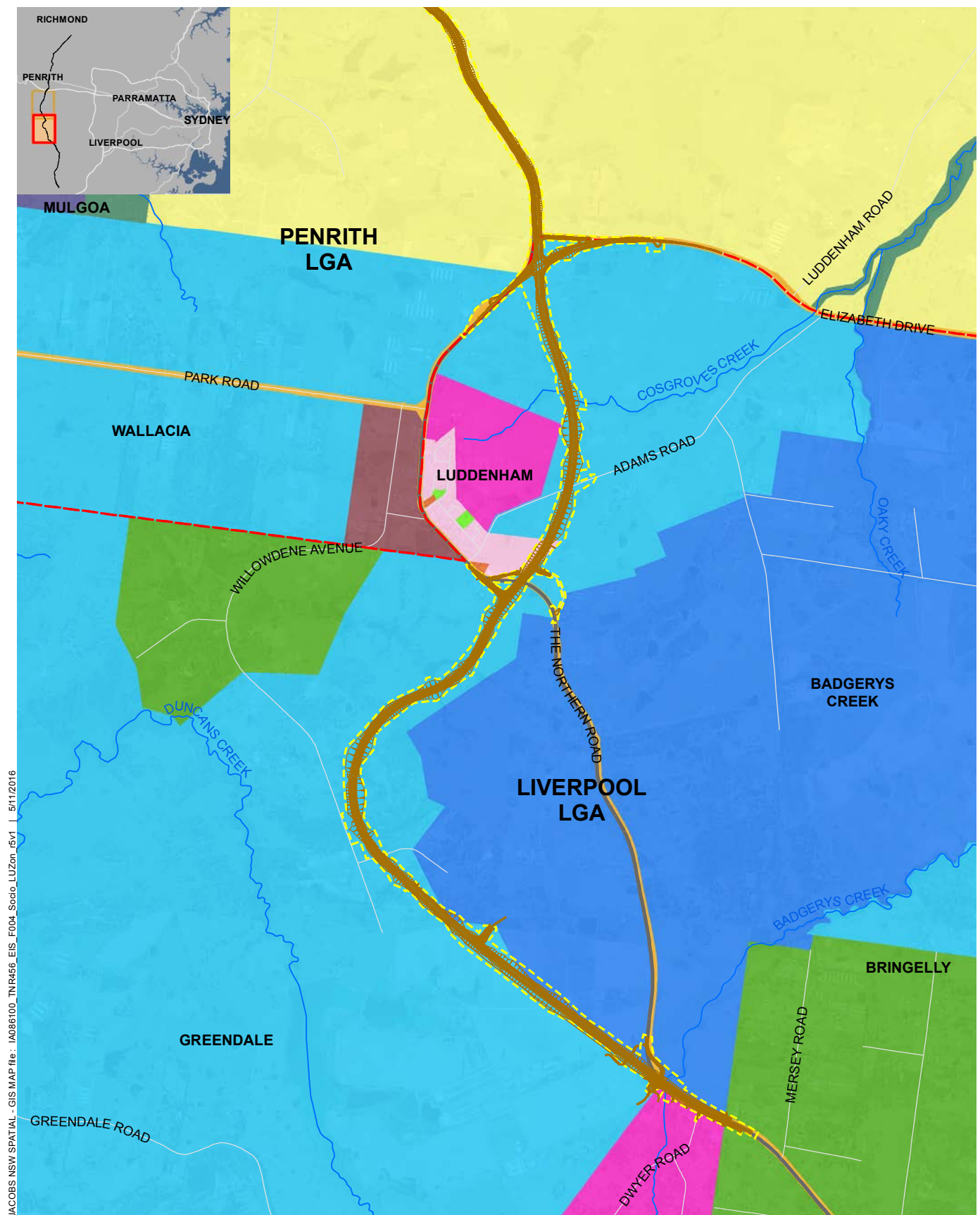
Land use zones within the study area are shown in **Figure 4-1**.

Rural use zones (RU) generally cover the southern part of the study area, mainly south of the WaterNSW supply pipelines. They include:

- Primary production areas, located south of Elizabeth Drive and generally west of The Northern Road at Luddenham, Greendale and Bringelly
- Small lot primary production around Willowdene Avenue at Luddenham and at Bringelly
- Rural landscape areas, located on either side of The Northern Road between the WaterNSW supply pipelines and Elizabeth Drive, and at Mulgoa opposite the Defence Establishment Orchard Hills
- Rural village at Luddenham, west of The Northern Road.

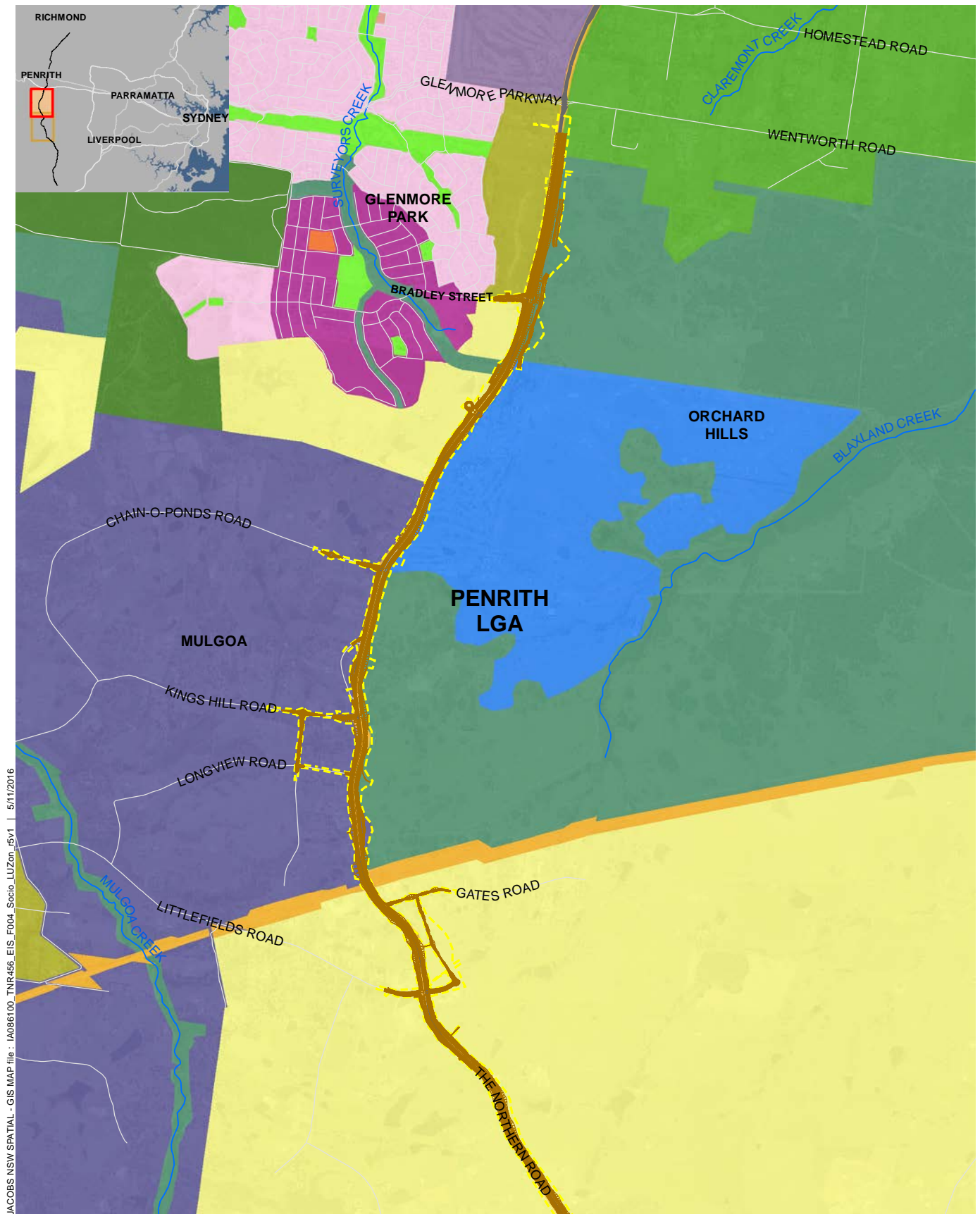
Residential zones (R) are mainly located at Bringelly, Luddenham and Glenmore Park. They include:

- Large lot residential areas at Luddenham, east of The Northern Road and Luddenham town centre and at Bringelly, south of The Northern Road
- Low density residential areas at Luddenham town centre, and Glenmore Park
- Environmental living and general residential areas at Glenmore Park.

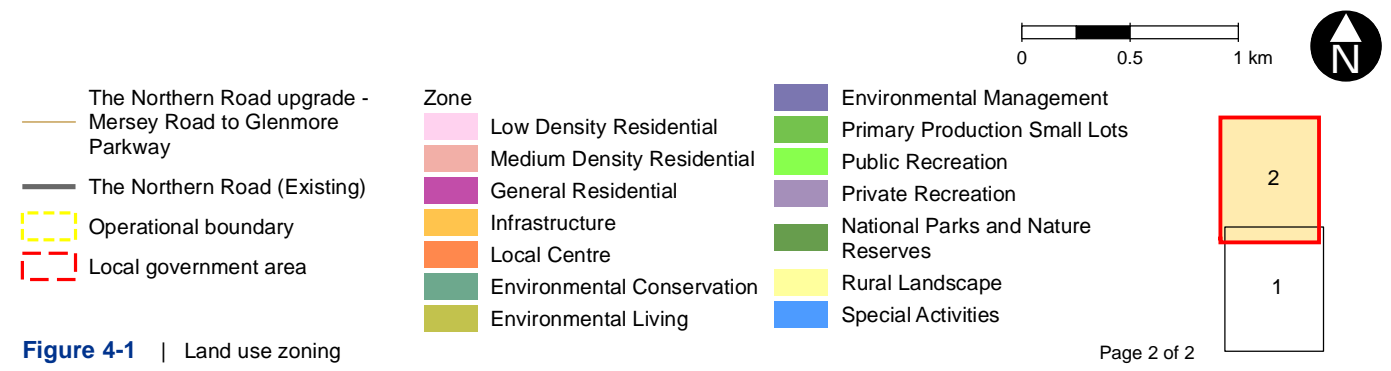


JACOBS NSW SPATIAL - GIS MAP file: J088100\_TNR456\_EIS\_F004\_Socio\_LUZon\_r5v1 | 5/11/2016

**Figure 4-1** | Land use zoning



JACOBS NSW SPATIAL - GIS MAP file - JA086100\_TNR456\_EIS\_F004\_Socio\_LUZon\_r5v1 | 5/11/2016





Land in the study area zoned for special purposes (SP) comprises:

- Special Activities zone, including:
  - Defence Establishment Orchard Hills, located in the northern part of the study area, east of The Northern Road (this includes the land occupied by the Orchard Hills Golf Club)
  - The site of the Western Sydney Airport at Badgery's Creek, located in the southern part of the study area, east of the proposed The Northern Road corridor.
- Infrastructure zone, including:
  - The existing The Northern Road Corridor
  - The WaterNSW supply pipelines, which crosses The Northern Road corridor at Orchard Hills and Mulgoa.

Land zoned for environment protection (E), is mainly located in the northern part of the study area. It includes:

- Environmental conservation areas, surrounding the Defence Establishment Orchard Hills and along Cosgroves Creek north of Elizabeth Drive
- Environmental management areas west of The Northern Road at Mulgoa.

Other land use zones in the study area include:

- Business zones (B), including neighbourhood centres within Luddenham town centre and local centres at Glenmore Park
- Recreation zones (RE), including public recreation areas at Glenmore Park and Luddenham, and land zoned for private recreation at Glenmore Park (Penrith Golf and Recreation Club) north of the project.

**Table 4-1** provides a summary of the land use zones directly impacted by the construction footprint of the project, along with an overview of the zone objectives.

**Table 4-1 : Land use zones**

Land use zone	Objectives of the zone
<b>Penrith LGA</b>	
E2 Environmental conservation	<ul style="list-style-type: none"> <li>• To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values</li> <li>• To prevent development that could destroy, damage or otherwise have an adverse effect on those values</li> <li>• To protect, manage, restore and enhance the ecology, hydrology and scenic values of riparian corridors and waterways, wetlands, groundwater resources, biodiversity corridors, areas of remnant indigenous vegetation and dependent ecosystems</li> <li>• To allow for low impact passive recreational and ancillary land uses that are consistent with the retention of the natural ecological significance</li> </ul>
E3 Environmental management	<ul style="list-style-type: none"> <li>• To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values</li> <li>• To provide for a limited range of development that does not have an adverse effect on those values</li> <li>• To minimise conflict between land uses within the zone and land uses within adjoining zones</li> <li>• To ensure development is compatible with the environmental capabilities of the land and does not unreasonably increase the demand for public services or public facilities</li> <li>• To preserve and improve natural resources through appropriate land management practices</li> </ul>

Land use zone	Objectives of the zone
E4 Environmental living	<ul style="list-style-type: none"> <li>• To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values</li> <li>• To ensure that residential development does not have an adverse effect on those values</li> <li>• To minimise conflict between land uses within the zone and land uses within adjoining zones</li> <li>• To ensure land uses are compatible with the available infrastructure, services and facilities and with the environmental capabilities of the land</li> <li>• To preserve and improve natural resources through appropriate land management practices</li> </ul>
RU1 Primary production	<ul style="list-style-type: none"> <li>• To encourage sustainable primary industry production by maintaining and enhancing the natural resource base</li> <li>• To encourage diversity in primary industry enterprises and systems appropriate for the area</li> <li>• To minimise the fragmentation and alienation of resource lands</li> <li>• To minimise conflict between land uses within this zone and land uses within adjoining zones</li> <li>• To protect and enhance the existing agricultural landscape character of the land</li> <li>• To ensure development is compatible with the environmental capabilities of the land and does not unreasonably increase the demand for public services or public facilities</li> <li>• To preserve and improve natural resources through appropriate land management practices</li> </ul>
RU2 Rural landscape	<ul style="list-style-type: none"> <li>• To encourage sustainable primary industry production by maintaining and enhancing the natural resource base</li> <li>• To maintain the rural landscape character of the land</li> <li>• To provide for a range of compatible land uses, including extensive agriculture</li> <li>• To minimise conflict between land uses within the zone and land uses within adjoining zones</li> <li>• To preserve and improve natural resources through appropriate land management practices</li> <li>• To ensure development is compatible with the environmental capabilities of the land and does not unreasonably increase the demand for public services or public facilities</li> </ul>
RU4 Primary production small lots	<ul style="list-style-type: none"> <li>• To enable sustainable primary industry and other compatible land uses</li> <li>• To encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature</li> <li>• To minimise conflict between land uses within this zone and land uses within adjoining zones</li> <li>• To ensure land uses are of a scale and nature that is compatible with the environmental capabilities of the land</li> <li>• To preserve and improve natural resources through appropriate land management practices</li> <li>• To maintain the rural landscape character of the land</li> <li>• To ensure that development does not unreasonably increase the demand for public services or facilities</li> </ul>

Land use zone	Objectives of the zone
SP1 Special activities	<ul style="list-style-type: none"> <li>To provide for special land uses that are not provided for in other zones</li> <li>To provide for sites with special natural characteristics that are not provided for in other zones</li> <li>To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land</li> </ul>
SP2 Infrastructure	<ul style="list-style-type: none"> <li>To provide for infrastructure and related uses</li> <li>To prevent development that is not compatible with or that may detract from the provision of infrastructure</li> </ul>
<b>Liverpool LGA</b>	
RU1 Primary production	<ul style="list-style-type: none"> <li>To encourage sustainable primary industry production by maintaining and enhancing the natural resource base</li> <li>To encourage diversity in primary industry enterprises and systems appropriate for the area</li> <li>To minimise the fragmentation and alienation of resource lands</li> <li>To minimise conflict between land uses within this zone and land uses within adjoining zones</li> <li>To ensure that development does not unreasonably increase the demand for public services or public facilities</li> <li>To ensure that development does not hinder the development or operation of an airport on Commonwealth land in Badgery's Creek</li> <li>To preserve bushland, wildlife corridors and natural habitat</li> </ul>
RU4 Primary production small lots	<ul style="list-style-type: none"> <li>To enable sustainable primary industry and other compatible land uses</li> <li>To encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature</li> <li>To minimise conflict between land uses within this zone and land uses within adjoining zones</li> </ul>
R2 Low density residential	<ul style="list-style-type: none"> <li>To provide for the housing needs of the community within a low density residential environment</li> <li>To enable other land uses that provide facilities or services to meet the day to day needs of residents</li> <li>To provide a suitable low scale residential character commensurate with a low dwelling density</li> <li>To ensure that a high level of residential amenity is achieved and maintained</li> </ul>
R5 Large lot residential	<ul style="list-style-type: none"> <li>To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality</li> <li>To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future</li> <li>To ensure that development in the area does not unreasonably increase the demand for public services or public facilities</li> <li>To minimise conflict between land uses within this zone and land uses within adjoining zones</li> <li>To ensure that a high level of residential amenity is achieved and maintained</li> <li>To provide for complementary uses that are of low impact and do not unreasonably increase the demand for public services or public facilities</li> </ul>

Land use zone	Objectives of the zone
SP1 Special activities	<ul style="list-style-type: none"> <li>To provide for special land uses that are not provided for in other zones</li> <li>To provide for sites with special natural characteristics that are not provided for in other zones</li> <li>To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land</li> </ul>
SP2 Infrastructure	<ul style="list-style-type: none"> <li>To provide for infrastructure and related uses</li> <li>To prevent development that is not compatible with or that may detract from the provision of infrastructure</li> <li>To reserve land for the provision of infrastructure</li> </ul>

Source: Penrith LEP 2010; Liverpool LEP 2008

The Penrith LEP identifies land within the study area at Mulgoa and Glenmore Park as an urban release area (Glenmore Park Stage 2). The purpose of this land is to facilitate the sustainable development of residential, mixed use, retail and open space uses. Land within the operational footprint covered by the urban release area is currently zoned environmental conservation (E2).

#### 4.2.2 Areas of public domain

The public domain comprises the community's public space, both functionally and visually (Roads and Maritime Services, undated). It includes shared urban areas and spaces, the structures that relate to those spaces and the infrastructure that supports and serves them, such as areas that are publicly owned and commonly accessed/ used by the community (for example, parks, public squares and road verges); spaces between public and private activities (for example, outdoor eating and/or trading areas); private spaces that are visible but physically inaccessible to the public (Penrith City Council, 2014).

Key characteristics of the public domain in the study area include:

- Landscaping of the road verge for The Northern Road and other roads, which mainly comprises grassed areas and some established trees, but also includes moderately vegetated areas (for example, south of Bradley Street, near Grover Crescent and south of Luddenham town centre)
- Established trees and landscaping within properties along The Northern Road
- Rural landscapes, including grazing and cropping areas, rural residential uses, and conservation areas
- Luddenham town centre, which is characterised by its 'village' feel, and includes a mix of residential, commercial and community uses along The Northern Road
- Open space and recreation areas, including golf courses.

The public domain in the study area is affected by existing traffic on The Northern Road, including heavy vehicles, impacting noise, air quality, visual amenity and safety for local communities and road users. In particular, traffic volumes through the Luddenham town centre impact on the amenity and quality of the public domain.

### 4.3 Population and housing

This section describes the key population, demographic and housing characteristics of the study area. In particular, it provides information on those groups within the community that may be most vulnerable to changes brought about by the project due to such things as their level of economic resources, age or need for assistance.

Data is provided for each of the SA2 areas within the study area along with data for the LGAs and NSW as a comparison. The information presented is primarily based on data from the ABS 2011 Census, supplemented



with information and data from other relevant sources such as NSW Government departments and Penrith and Liverpool councils. Further demographic information is also provided in **Appendix B**.

#### 4.3.1 Population size, growth and mobility

The study area had a total resident population of 42,049 people at June 2015, of which more than half lived within Glenmore Park-Regentville. Mulgoa-Luddenham-Orchard Hills had the smallest resident population at 7,867 people (refer to **Table 4-2**). This reflects the urban, residential nature of the Glenmore Park-Regentville SA2 compared to the rural land uses within the other SA2s.

Over the 10 years to June 2015, the population of the study area grew by about 6,559 people, an average of about 1.7 per cent per annum. This was above the rate of population growth for NSW over the same period and was driven by relatively high population growth in Mulgoa-Luddenham-Orchard Hills and Badgerys Creek-Greendale, particularly between 2010 and 2015.

At a regional level, Penrith and Liverpool LGAs had a combined population of about 402,516 people at June 2015. Over the five and 10 years to 2015, average population growth in the Liverpool LGA was above the NSW average. Average population growth in the Penrith LGA was below the NSW average over the 10 years to 2015, although above the NSW average in the shorter term.

**Table 4-2 : Estimated resident population, 2005-2015**

Locality	ERP as at 30 June			Change (2005-2010)		Change (2010-2015)	
	2005	2010	2015	Number	Av. annual change (%)	Number	Av. annual change (%)
Glenmore Park-Regentville	20,080	21,461	23,092	3,012	1.4%	1,631	1.5%
Mulgoa-Luddenham-Orchard Hills	6,391	6,700	7,867	1,476	2.1%	1,167	3.3%
Badgerys Creek-Greendale	9,019	9,853	11,090	2,071	2.1%	1,237	2.4%
Study area	35,490	38,014	42,049	6,559	1.7%	4,035	2.0%
Penrith LGA	175,799	184,910	204,594	28,795	1.5%	19,684	2.0%
Liverpool LGA	167,472	184,910	204,594	37,122	2.0%	19,684	2.0%
NSW	6,693,206	7,144,292	7,617,684	924,478	1.3%	473,392	1.3%

Source: Commonwealth of Australia (2016a), *Regional Population Growth, Australia, 2014-15* (Catalogue number 3218.0)

Information on population projections for the study area is available at an LGA level (refer to **Table 4-3**). The LGAs of Penrith and Liverpool are expected to experience relatively high rates of population growth over the 20 years to 2031, compared to NSW and the wider Sydney Metropolitan area. The combined population of the LGAs is projected to grow to about 550,400 people in 2031. This represents an increase of about 177,700 people from 2011, or an average annual growth rate of 2.0 per cent.

Population growth in the region is expected to focus on the Western Sydney Priority Growth Area, around the Western Sydney Airport at Badgerys Creek. The NSW Government is currently preparing a draft Land Use and Infrastructure Strategy to guide growth and investment in this area.

Table 4-3 : Population projections, 2011-2031

Locality	Population		Population change (2011-2031)	
	2011	2031	Number	Av. annual change (%)
Penrith LGA	184,600	261,450	76,850	1.8
Liverpool LGA	188,100	288,950	100,850	2.2
Metropolitan Sydney	4,286,200	5,861,750	1,575,550	1.6
NSW	7,218,550	9,228,350	2,009,800	1.2

Source: NSW Government (2014b) New South Wales State and Local Government Area Population Projections: 2014 Final

The study area generally had relatively low levels of population mobility, with higher proportions of people who had lived at the same address both 12 months and five years prior to the 2011 Census compared to NSW (refer to **Table 4-4**). In 2011, 84.7 per cent of people in the study area lived at the same address 12 months prior to the 2011 Census, while 63.4 per cent lived at the same address five years prior to the Census. This is compared to 81.0 per cent and 57.2 per cent respectively, of people in NSW as a whole.

The population of Mulgoa-Luddenham-Orchard Hills demonstrated particularly low levels of mobility over both 12 months and five years, demonstrating relatively stable population. This is likely to reflect the more rural nature and more established communities in this area. Glenmore Park-Regentville recorded a level of population mobility above the study area average over the five years to 2011, which is likely to reflect the urban development that has occurred in this area since the 1990s.

Table 4-4 : Population mobility, 2011 (%)

Locality	Same address 12 months prior to 2011 Census	Same address five years prior to 2011 Census
Glenmore Park-Regentville	86.2	61.5
Mulgoa-Luddenham-Orchard Hills	86.3	69.1
Badgerys Creek-Greendale	80.7	63.8
Study area	84.7	63.4
Penrith LGA	84.1	62.6
Liverpool LGA	83.0	61.0
NSW	81.0	57.2

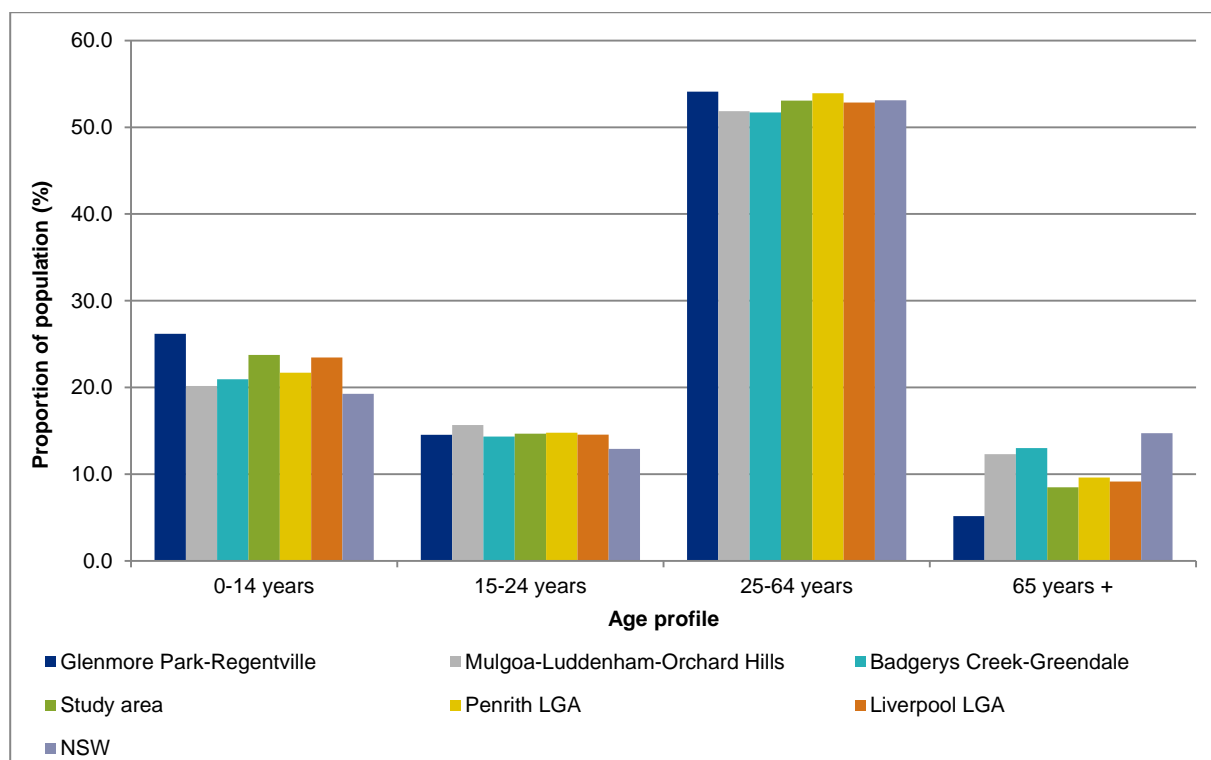
Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)

#### 4.3.2 Age profile

At the 2011 Census, the age profile of the study area generally reflected the age profiles for both the Penrith and Liverpool LGAs. The study area as a whole had a younger population compared to NSW, with a lower median age; higher proportion of children aged 14 years or under and people aged 25-44 years; and lower proportions of older people aged 65 years or over (refer to **Figure 4-2**).

The younger age profile of the study area was generally driven by a relatively young population in Glenmore Park-Regentville. At the 2011 Census, Glenmore Park-Regentville recorded a median age of 31 years, seven years below NSW as a whole. The older age profiles of Mulgoa-Luddenham-Orchard Hills and Badgerys Creek-Greendale is likely to reflect the more rural nature and more established communities in these areas.

Figure 4-2 : Age profile, 2011



Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)

### 4.3.3 Cultural diversity

Communities in the study area as a whole generally display lower levels of diversity compared with NSW, with lower proportions of Aboriginal people and people born overseas, and higher proportions of people who speak English only (refer to **Table 4-5**).

At the 2011 Census, about 26.3 per cent of people in the study area were born overseas. After Australia, the most common countries of birth were:

- The United Kingdom, Channel Islands and Isle of Man (4.1 per cent)
- Italy (2.2 per cent)
- Malta (1.3 per cent)
- Philippines (1.3 per cent)
- India (1.2 per cent).

About 19.3 per cent of people in the study area spoke a language other than English at home. The most common languages spoken at home after English were Italian (3.8 per cent); Arabic (2.6 per cent); and Maltese (1.3 per cent).

Nearly 10 per cent of people in the study area did not speak English well or at all, compared to 12.3 per cent in NSW as a whole. However, the population of Badgerys Creek-Greendale had relatively low levels of English proficiency, with 22.0 per cent not speaking English well or at all. People with lower levels of English proficiency represent a stakeholder group with particular communication needs and who may be more vulnerable to changes from the project.

Within the study area, the Badgerys Creek-Greendale SA2 recorded higher levels of diversity, with proportions of people who were born overseas, who spoke a language other than English and who did not speak English

well or at all above the NSW average. At the 2011 Census, about 10.6 per cent of people in this SA2 spoke Italian and a further 6.0 per cent spoke Arabic.

At a regional level, the Liverpool LGA displayed high levels of diversity, with high proportions of people born overseas, people who speak a language other than English at home, and people with lower levels of English proficiency.

**Table 4-5 : Cultural diversity, 2011 (%)**

Locality	Aboriginal people	People born overseas	Speaks language other than English at home	Does not speak English well or at all
Glenmore Park-Regentville	1.6	3.3	13.0	3.3
Mulgoa-Luddenham-Orchard Hills	1.7	2.1	14.2	4.7
Badgerys Creek-Greendale	1.4	3.7	36.1	22.0
Study area	1.6	3.2	19.3	9.8
Penrith LGA	3.0	3.7	14.6	5.8
Liverpool LGA	1.5	9.0	49.8	17.2
NSW	2.5	4.7	22.5	12.3

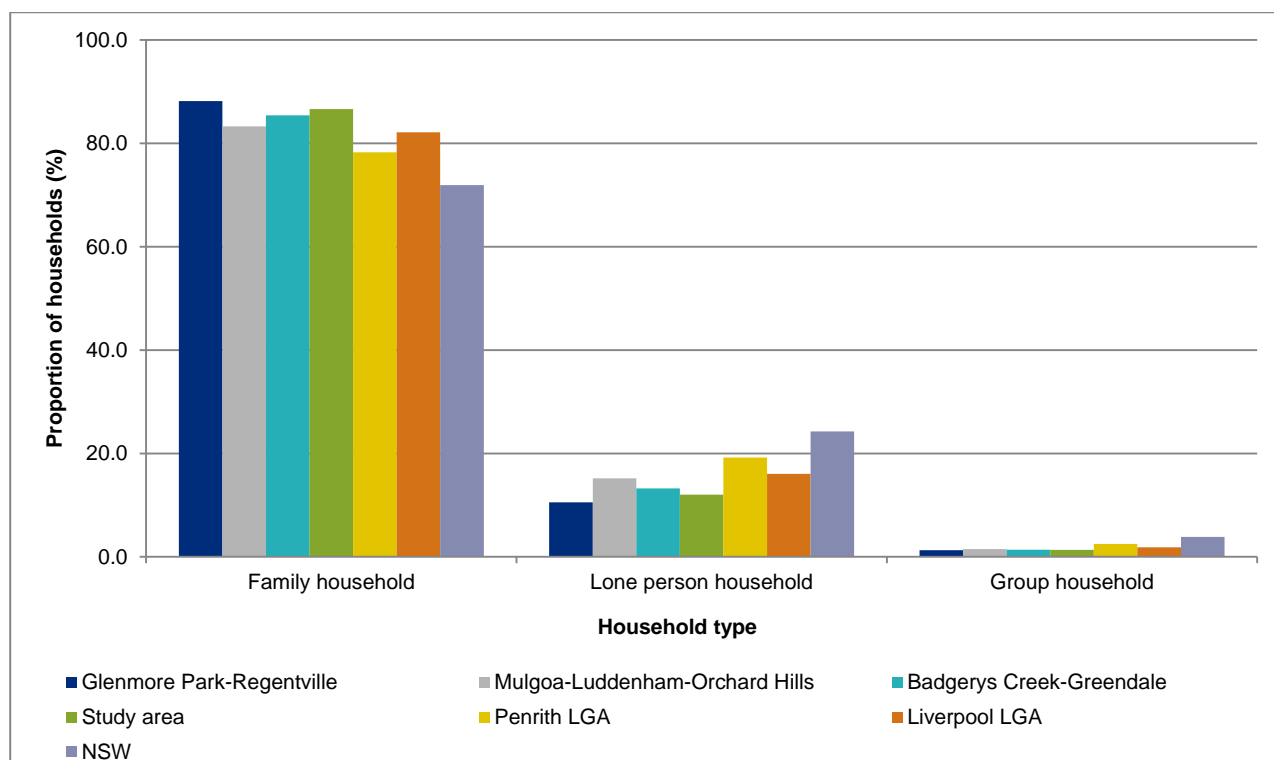
Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)

#### 4.3.4 Households and families

There were about 11,070 households in the study area at the 2011 Census. Compared to NSW, the study area had high proportions of family households and relatively low proportions of lone person and group households (refer to **Figure 4-3**).

At a regional level, there were about 112,986 households in the Penrith and Liverpool LGAs in 2011. This is projected to grow to about 191,550 by 2031, an average of about 2.2 per cent annually. This is above the projected rate of growth for both Metropolitan Sydney and NSW as a whole. A focus for growth and development within the region includes the Western Sydney Priority Growth Area, located around the Western Sydney Airport at Badgerys Creek, and the South West Priority Growth Area, located south of Bringelly Road.

Figure 4-3 : Households, 2011



Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)

There were about 10,039 families in the study area in 2011 of which, 46.1 per cent comprised families with children aged under 15 years (refer to **Table 4-6**). This was higher than the proportion of this family type in NSW as a whole. Compared to NSW, the study area had lower proportions of couple only families and higher proportions of families with no children aged under 15 years.

Within the study area, Glenmore Park-Regentville had very high proportions of young families, with this family type comprising more than half of all families in this SA2.

Table 4-6 : Family composition, 2011

Locality	Couple family with no children (%)	Families with children under 15 years (%)	Families with no children under 15 years (%)	Total families
Glenmore Park-Regentville	25.2	51.0	22.7	5,781
Mulgoa-Luddenham-Orchard Hills	33.5	38.4	27.1	1,748
Badgerys Creek-Greendale	30.4	40.3	28.2	2,510
Study area	28.0	46.1	24.9	10,039
Penrith LGA	29.6	42.7	26.2	48,360
Liverpool LGA	23.7	47.2	27.8	46,563
NSW	36.6	38.9	22.8	1,829,553

Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)



### 4.3.5 Housing

#### Dwellings

There were 11,671 dwellings in the study area at the 2011 Census, of which about 95 per cent were occupied on Census night (refer to **Table 4-7**). Separate houses were the predominant dwelling type, accounting for about 88 per cent of dwellings in the study area. This was above the proportion of separate houses in the broader region and NSW as a whole, reflecting the outer suburban and semi-rural nature of the study area.

At a regional level, there were about 118,590 dwellings within the Penrith and Liverpool LGAs in 2011. It is projected that about 200,600 dwellings would be required to accommodate the region's population by 2031.

**Table 4-7 : Dwellings, 2011**

Locality	Separate house (%)	Semi-detached dwelling, etc (%)	Flat, unit or apartment	Total private dwellings
Glenmore Park-Regentville	88.3	7.6	0.7	6,574
Mulgoa-Luddenham-Orchard Hills	86.2	1.1	2.8	2,152
Badgerys Creek-Greendale	88.9	2.9	0.3	2,945
Study area	88.1	5.2	1.0	11,671
Penrith LGA	77.3	10.3	6.8	62,632
Liverpool LGA	72.1	11.4	12.1	55,958
NSW	62.8	9.6	17.0	2,736,637

Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)

#### Housing cost and tenure

Overall, the study area had levels of owner occupied houses above the NSW average, and houses that were being rented below NSW as a whole (refer to **Table 4-8**). At the 2011 Census, about 75.8 per cent of occupied private dwellings in the study area were either owned outright or owned with a mortgage. This is compared to about 66.5 per cent in NSW as a whole. Mulgoa-Luddenham-Orchard Hills and Badgerys Creek-Greendale had higher proportions of houses that were owned outright, which is likely to reflect the older population and more established residential uses in these areas. About 58 per cent of occupied private dwellings in Glenmore Park-Regentville were owned with a mortgage, which reflects the more recent residential development that has occurred in this area over recent years.

About 22.1 per cent of occupied dwellings in the study area were being rented in 2011, which was below the regional and State averages. Sixty-five occupied private dwellings in the study area were being rented from a State housing authority. This represented less than one per cent of occupied private dwellings in the study area, which was well below the NSW average. The study area had proportions of dwellings that were being rented through an 'other landlord type', such as a residential park or employer, marginally above the NSW average.

Households in the study area had relatively high housing costs, with median weekly rent and monthly mortgage costs above the NSW average. Median rental and mortgage costs were also above the averages for both Penrith and Liverpool LGAs. Compared to NSW, the study area has a higher proportion of households that are likely to experience levels of housing stress due to mortgage repayments. At the 2011 Census, an average of 13.7 per cent of households in the study area were paying 30 per cent or more of their income on mortgage payments, compared to 10.5 per cent in NSW. While above the NSW average in all study area SA2s, this was at 16.7 per cent in Glenmore Park-Regentville.

Table 4-8 : Housing tenure and costs, 2011

Locality	Owner occupied* (%)	Rented (%)	Rented (State housing authority) (%)	Median rental costs (\$/ week)	Median mortgage costs (\$/ month)	Rent payments are 30% or greater of household income (%)	Mortgage payments are 30% or greater of household income (%)
Glenmore Park-Regentville	77.7	21.0	0.8	360	2,200	6.5	16.7
Mulgoa-Luddenham-Orchard Hills	78.5	18.9	0.2	290	2,200	6.2	12.0
Badgerys Creek-Greendale	69.3	27.1	0.4	320	2,358	11.6	12.4
Study area**	75.8	22.1	0.6	323	2,253	8.1	13.7
Penrith LGA	70.6	26.7	4.4	300	1,983	9.8	13.2
Liverpool LGA	66.0	30.4	7.9	295	2,167	12.2	16.7
NSW	66.5	30.1	4.4	300	1,993	11.6	10.5

Notes: \* includes dwellings owned outright or owned with a mortgage; \*\* Median rental and mortgage costs and rent and mortgage payments for the study area refers to the average of SA2s in the study area

Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0); ABS (2013), 2011 Census QuickStats

#### 4.3.6 Socio-economic disadvantage and need for assistance

A community's level of socio-economic disadvantage may influence the ability of that community to cope with or respond to changes. The ABS produces a range of indices that indicate relative levels of socio-economic advantage and disadvantage (Socio-economic Indexes for Areas (SEIFA)). These include:

- The index of relative socio-economic disadvantage
- The index of relative socio-economic advantage and disadvantage
- The index of education and occupation
- The index of economic resources.

The SEIFA index of relative socio-economic disadvantage is derived from variables such as income, educational attainment, unemployment and vehicle ownership. Low decile values generally represent areas of disadvantage while high decile values generally represent areas of least disadvantage (Commonwealth of Australia, 2013a).

**Figure 4.4** shows relative socio-economic disadvantage within the study area at the 2011 Census (Commonwealth of Australia, 2013d). Communities in the southern part of the study area, south of Elizabeth Drive, generally demonstrate higher levels of relative disadvantage, with some communities in the bottom 30-40 per cent of communities in NSW in relation to disadvantage. Communities in the northern part of the study area generally display lower levels of relative disadvantage, particularly in Glenmore Park and Mulgoa.

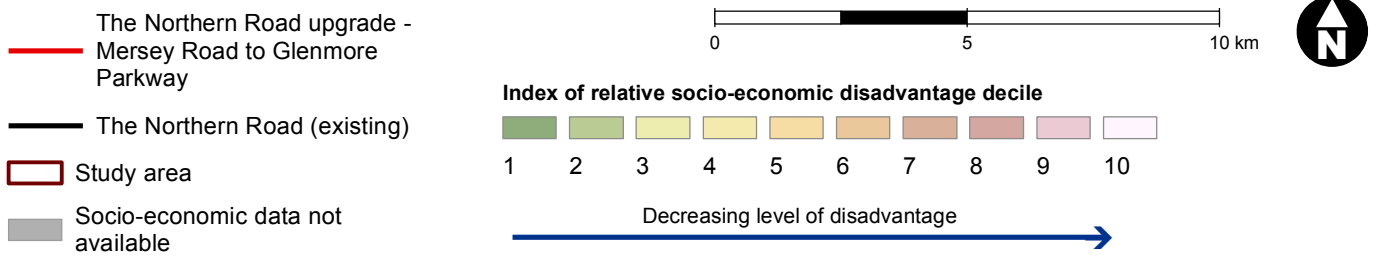
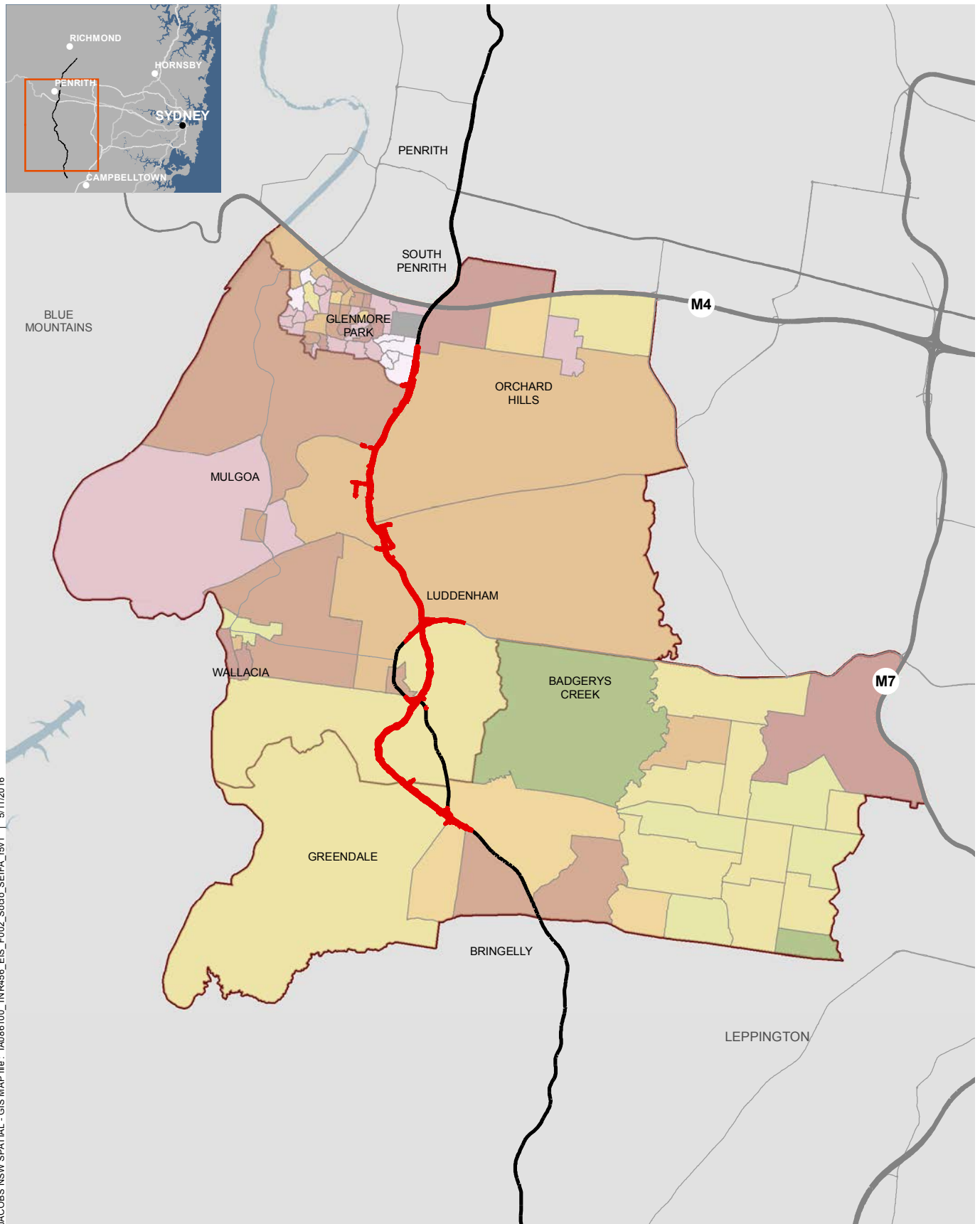


Figure 4-4 | Relative socio-economic disadvantage

Need for assistance refers to people who need help or assistance in at least one of the three core activity areas of self-care, mobility or communication due to disability, a long term health condition or old age. These groups may be more vulnerable to the effects of major projects, such as changes in local access; property acquisition, including loss of social and community networks; and changes in local amenity.

Overall the study area generally had levels of people needing assistance below the Penrith and Liverpool LGAs and NSW averages. At the 2011 Census, about 3.7 per cent of the study area's population needed assistance in at least one of the three core activities, compared to 4.3 per cent and 5.4 per cent in Penrith and Liverpool LGAs respectively, and 4.9 per cent in NSW.

Within the study area, Badgerys Creek-Greendale recorded the highest level of people needing assistance at 5.9 per cent. A further 8.4 per cent of people in this SA2 did not state whether they needed assistance, which was above the NSW average (at 5.7 per cent). Glenmore Park-Regentville recorded the lowest need for assistance in the study area.

#### 4.3.7 Vehicle ownership

Households in the study area generally had a high level of private vehicle access, with low proportions of households without access to a motor vehicle or only one motor vehicle, and high proportions of households with two or more motor vehicles (refer to **Table 4-9**). This is likely to reflect the study area's outer suburban and semi-rural location and lack of access to alternative transport options, such as bus and rail services.

**Table 4-9 : Vehicle ownership, 2011 (%)**

Locality	No motor vehicles	One motor vehicle	Two or more motor vehicles
Glenmore Park-Regentville	1.9	24.9	71.8
Mulgoa-Luddenham-Orchard Hills	3.0	20.3	74.2
Badgerys Creek-Greendale	2.8	20.3	73.1
Study area	2.3	22.9	72.5
Penrith LGA	7.5	32.5	57.1
Liverpool LGA	9.4	30.6	56.1
NSW	10.4	37.8	48.6

Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)

## 4.4 Economic profile

This section describes the key economic characteristics of the study area, including income, employment and local business and industry.

### 4.4.1 Income and employment

#### Income

The study area recorded median personal and household incomes above the NSW average in 2011. Income levels varied across the study area, with higher median incomes for the study area as a whole generally driven by very high incomes in Glenmore Park-Regentville (refer to **Table 4-10**). Badgerys Creek-Greendale had a median personal income below the NSW average although household incomes were above the NSW average.

Compared to NSW, the study area generally had lower proportions of low income households (with a weekly income of less than \$600) and higher proportions of high income households (with a weekly income of \$2,000

or more). The higher proportion of high income households in the study area was generally due to high proportions of this household type in Glenmore Park-Regentville and Mulgoa-Luddenham-Orchard Hills.

**Table 4-10 : Income, 2011**

Locality	Median total income (\$/week)		Weekly household income (%)	
	Personal income	Household income	Personal income	Household income
Glenmore Park-Regentville	780	1,920	8.7	42.9
Mulgoa-Luddenham-Orchard Hills	629	1,594	14.9	35.0
Badgerys Creek-Greendale	495	1,310	16.1	26.1
Study area	635*	1,608*	11.6	37.4
Penrith LGA	623	1,398	16.9	28.0
Liverpool LGA	510	1,299	19.1	26.1
NSW	561	1,237	21.7	26.7

Notes: \* Average of median incomes for SA2s in the study area

Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)

## Employment

There were about 19,691 people in the study area aged 15 years or over who were either employed or looking for work at the 2011 Census. This represented a labour force participation rate of 69.2 per cent, which was above the NSW average at 59.7 per cent (refer to **Table 4-11**). Labour force participation varied across the study area, with Glenmore Park-Regentville having high rates of participation, while Badgerys Creek-Greendale reported labour force participation below the NSW average.

The study area had a relatively low rate of unemployment, with 3.9 per cent of the study area's labour force unemployed at the 2011 Census. This is compared to 5.9 per cent in NSW and 5.5 per cent and 7.0 per cent in Penrith LGA and Liverpool LGA respectively.

**Table 4-11 : Labour force, 2011**

Locality	Labour force	Labour force participation	Unemployment
Glenmore Park-Regentville	11,714	76.0	3.6
Mulgoa-Luddenham-Orchard Hills	3,472	66.6	3.9
Badgerys Creek-Greendale	4,505	57.7	4.7
Study area	19,691	69.2	3.9
Penrith LGA	92,283	66.0	5.5
Liverpool LGA	80,188	58.2	7.0
NSW	3,334,857	59.7	5.9

Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)



In 2011, key industries of employment for residents in the study area included:

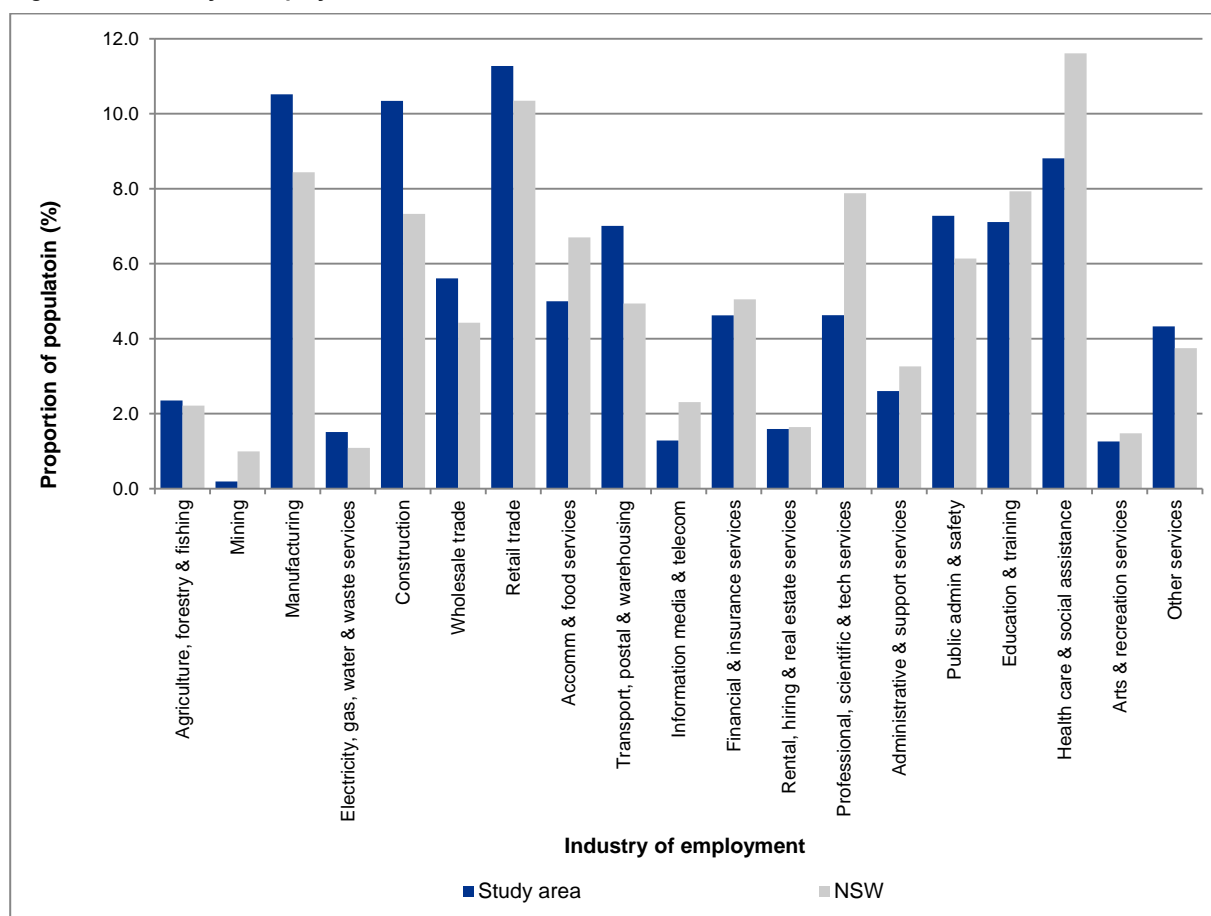
- Retail trade (employing 11.3 per cent of the study area's population aged 15 years or over)
- Manufacturing (10.5 per cent)
- Construction (10.3 per cent)
- Health care and social assistance (8.8 per cent)
- Public administration and safety (7.3 per cent).

Apart from health care and social assistance, the proportion of people employed in these industries was above the NSW average (refer to **Figure 4-5**).

About 445 people in the study area were employed in agriculture, forestry and fishing at the 2011 Census. This represented about 2.4 per cent of the study area's population aged 15 years or over, which was marginally above the NSW average at 2.2 per cent. Agriculture, forestry and fishing was a particularly important industry for Badgerys Creek-Greendale, employing about 332 people or 7.7 per cent of people aged 15 years or over in this SA2.

There were approximately 946 people in the study area employed in tourism related industries, such as accommodation and food services. This represented about 5.0 per cent of people aged 15 years or over, which was below the NSW and regional averages.

**Figure 4-5 : Industry of employment, 2011**



Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)

#### 4.4.2 Agriculture

The distribution of agricultural land uses in the study area is shown on **Figure 4.6**. Land used for cropping is mainly located in the southern part of the study area, west of The Northern Road. Horticultural land is scattered across the study area, although is mainly located at Luddenham and Wallacia.

In 2010-2011, the study area had a total of 6,541 hectares of agricultural land, of which nearly 65 per cent was located in Badgerys Creek-Greendale and about 35 per cent in Mulgoa-Luddenham-Orchard Hills (refer to **Table 4-12**).

Land used for grazing comprised nearly three quarters of agricultural land in the study area, with cropping comprising about a further 8 per cent. Remaining agricultural land comprised a mix of conservation land, land not used for agricultural production, and land used for forestry.

Total agricultural land in the study area comprised about 67 per cent of combined agricultural land in the Penrith and Liverpool LGAs. The study area accounted for about 68.8 per cent of the region's grazing land, and about 55.2 per cent of land used for cropping. Total agricultural land in the study area represented about 0.01 per cent of total agricultural land in NSW.

**Table 4-12 : Agricultural industry, 2010-2011**

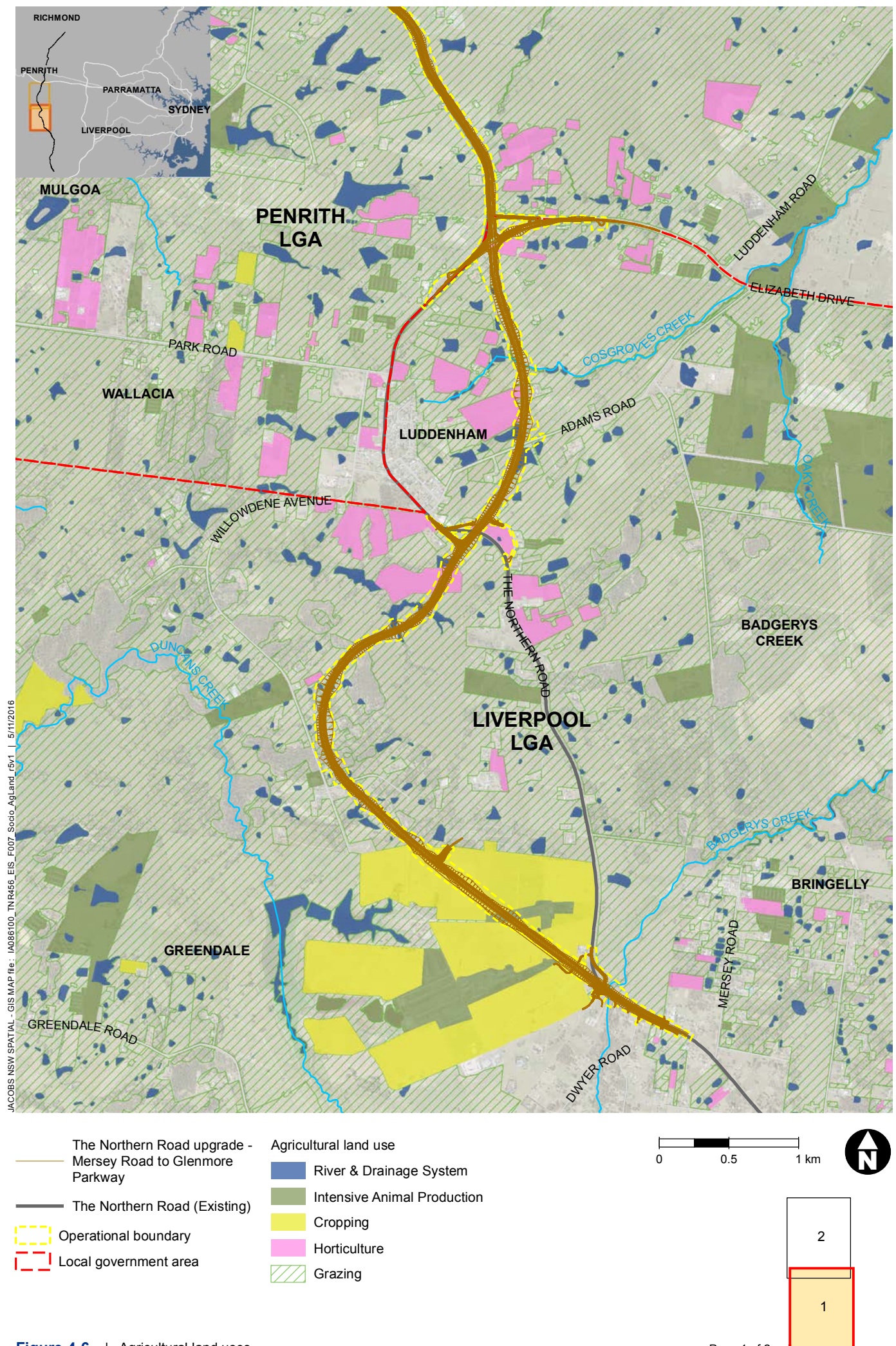
Area of holding	Indicator	Glenmore Park-Regentville	Mulgoa-Luddenham-Orchard Hills	Badgerys Creek-Greendale	Study area	NSW
Total area of holding	Estimated area (hectares)	18.0	2,278	4,245	6,541	58,326,346
	Proportion of study area (%)	0.3	34.8	64.9	100.0	n/a
Land mainly used for crops	Estimated area (hectares)	0.0	168	348	516	9,209,190
	Proportion of study area (%)	0.0	32.6	67.4	100.0	n/a
Land mainly used for grazing	Estimated area (hectares)	18.0	2,000	2,756	4,774	46,419,229
	Proportion of study area (%)	0.4	41.9	57.7	100.0	n/a

Source: Commonwealth of Australia (2012), *Agricultural Commodities, Australia 2010-11* (Catalogue number 7121.0)

The NSW Government has mapped land at a regional scale to identify areas of Biophysical Strategic Agricultural Land (BSAL) across NSW. BSAL comprises land with high quality soil and water resources capable of sustaining high levels of productivity. No land within the study area is identified at a regional level as BSAL, with the nearest areas mapped as BSAL located along the Nepean River ([www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/Safeguarding-our-Agricultural-Land](http://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/Safeguarding-our-Agricultural-Land)).

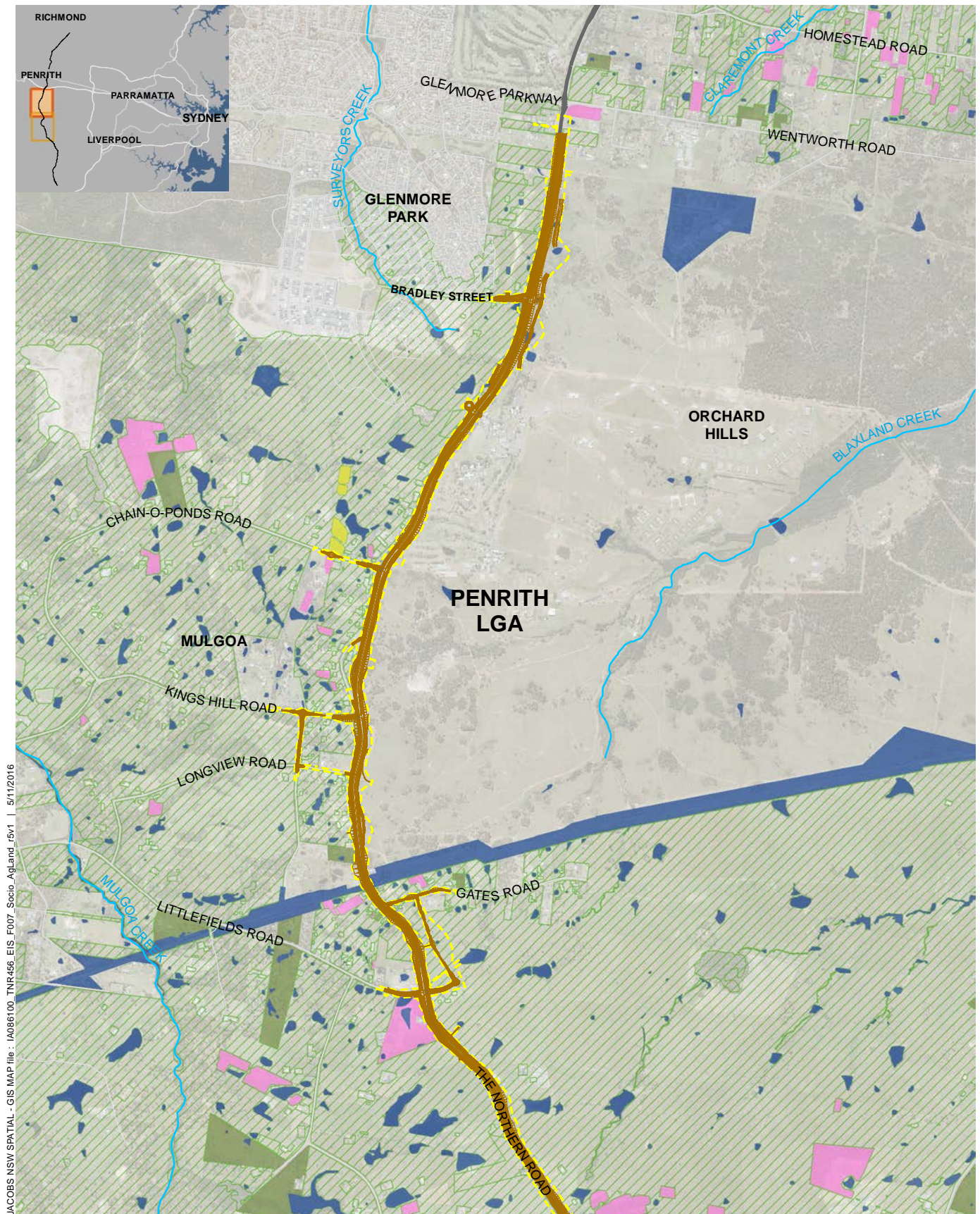
Regional land and soil capability mapping indicates that land within the study area mainly comprises areas of low to moderate capability. Land defined as moderate capability land is generally suitable for pasture cropping, grazing, some horticulture and forestry. Land defined as having moderate-low capability is generally suitable for nature conservation and limited cropping and cultivation, while low capability land is generally suitable for grazing, forestry and nature conservation (State of NSW, Hawkesbury-Nepean Catchment Management Authority, 2013).



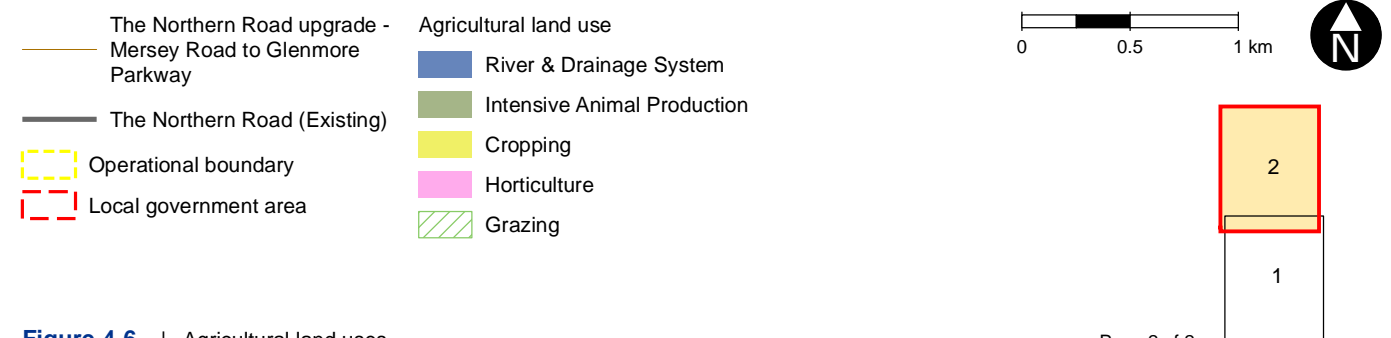


JACOBS NSW SPATIAL - GIS MAP file: J080100\_TNR456\_EIS\_F007\_Socio\_AgLand\_r5v1 | 5/11/2016





JACOBS NSW SPATIAL - GIS MAP file : IA086100\_TNR456\_EIS\_F007\_Socio\_AgLand\_r5v1 | 5/11/2016



**Figure 4-6** | Agricultural land uses



**Table 4-13** provides information on the main agricultural commodities in the study area. In 2010-2011, there were about 338 agricultural businesses in the study area, of which about 129 businesses were farming livestock, and about 217 businesses were farming crops. About 77.2 per cent of agricultural businesses were located in Badgerys Creek-Greendale, with a further 21.9 per cent in Mulgoa-Luddenham-Orchard Hills. Agricultural businesses in Glenmore Park-Regentville accounted for less than one per cent of agricultural businesses in the study area, reflecting the increased urban development that has occurred in this area.

Vegetable farms comprised the largest number of agricultural businesses in the study area, with about 163 vegetable farms (about 48.2 per cent of agricultural businesses) in the study area in 2010-2011. Tomatoes, herbs, lettuce, capsicum and broccoli were the top five vegetables farmed in the study area by land area and number of businesses. Nearly 90 per cent of vegetable farms in the study area were located in Badgerys Creek-Greendale, with the remaining 10 per cent in Mulgoa-Luddenham-Orchard Hills. The next largest producers by number of businesses were:

- Meat (beef) cattle enterprises, which represented about 16.6 per cent of agricultural businesses (56 businesses) in the study area. About 55 per cent of beef cattle farms in the study area were located in Mulgoa-Luddenham-Orchard Hills
- Poultry meat farms, which comprised about 7.7 per cent of farming businesses (26 businesses) in the study area, nearly all of which were located in Badgerys Creek-Greendale
- Nurseries, which accounted for 16 agricultural businesses (about 4.7 per cent of total agricultural businesses) in the study area in 2010-2011. About 80 per cent of nurseries were located in Badgerys Creek-Greendale.

In 2010-2011, there were five dairy farms with a total of 4,903 dairy cattle in the study area, with all of these located in Badgerys Creek-Greendale. This represented about half of dairy farms in the combined Liverpool and Penrith LGAs, and about 91 per cent of cattle. Dairy businesses in the study area represented about 0.3 per cent of dairy businesses in NSW, and about 1.5 per cent of dairy cattle.

**Table 4-14** shows the value of agricultural production in the Penrith and Liverpool LGAs in 2010-2011. The Penrith LGA had a total agricultural output of about \$83 million in 2010. At the same time, total agricultural output in the Liverpool LGA was about \$73 million. This represented about 0.7 per cent and 0.6 per cent of total agricultural production in NSW as a whole.

In terms of value, meat poultry was the largest commodity produced in both the Penrith and Liverpool LGAs in 2010-2011. In particular, this represented nearly 50 per cent of agricultural production value in the Liverpool LGA. Combined, the Penrith and Liverpool LGAs represented about 14.7 per cent of meat poultry production in NSW. Other important commodities in relation to agricultural production value included:

- Vegetables, which represented nearly 25 per cent of the combined value of agricultural production in the Penrith and Liverpool LGAs. Vegetables represented about 27.6 per cent of Liverpool LGA's agricultural production value alone
- Eggs, which represented about 31 per cent of the value of agricultural production in the Penrith LGA. This comprised about 13.3 per cent of the value of egg production in NSW
- Dairy cattle, which comprised about 9.2 per cent of the value of agricultural production in the Liverpool LGA. This represented about 1.3 per cent of milk production in NSW.



Table 4-13 : Agricultural commodities, 2010-2011

Agricultural commodity	Glenmore Park-Regentville		Mulgoa-Luddenham-Orchard Hills		Badgerys Creek-Greendale		Study area		NSW	
	Estimate	No. of ag. businesses	Estimate	No. of ag. businesses	Estimate	No. of ag. businesses	Estimate	No. of ag. businesses	Estimate	No. of ag. businesses
<b>Livestock</b>										
Beef cattle (number)	7	1	1,244	31	818	24	2,069	56	5,383,931	27,166
Dairy cattle (number)	0	0	0	0	4,903	5	4,903	5	325,821	1,501
Chickens for eggs (number)	0	0	22,033	2	66,661	6	88,694	8	4,397,898	789
Poultry for meat (incl chicken, duck, turkey) (number)	0	0	323,766	2	1,801,018	24	2,124,784	26	33,426,797	487
Horses non-stud (number)	0	0	11	4	24	8	35	12	33,632	2,448
Horses stud (number)	2	1	25	5	112	8	139	14	53,679	10,660
Pigs (number)	0	0	0	0	513	1	513	1	486,178	742
Sheep lambs (number)	0	0	46	2	61	5	107	7	26,824,697	16,416
Total livestock/ livestock businesses*	9	2	347,132	45	1,874,118	74	2,221,259	129	71,375,268	59,129
<b>Cropping</b>										
Hay (hectares)	17	1	29	2	15	2	61	5	312,513	8,294
Broadacre crops – cereal crops (hectares)	0	0	0	0	154	1	154	1	5,452,675	10,837
Broadacre crops – non cereal crops (hectares)	0	0	0	0	16	8	16	8	1,594,140	8,396
Fruit and nuts (excl grapes) (hectares)	0	0	26	4	1	1	27	5	47,483	2,741

Agricultural commodity	Glenmore Park-Regentville		Mulgoa-Luddenham-Orchard Hills		Badgerys Creek-Greendale		Study area		NSW	
	Estimate	No. of ag. businesses	Estimate	No. of ag. businesses	Estimate	No. of ag. businesses	Estimate	No. of ag. businesses	Estimate	No. of ag. businesses
Fruit and nuts – grapes (hectares)	0	0	5	3	0	0	5	3	44,155	1,655
Cut flowers (hectares undercover)	0.0	0	0.0	0	0.2	5	0.2	5	55	589
Cultivated turf (hectare info not available)	n/a	0	n/a	0	n/a	1	n/a	1	n/a	127
Nurseries (hectares undercover)	0.0	0	0.1	3	1.6	13	1.7	16	117.6	1,535
Vegetables (hectares)	0	0	70	17	322	146	392	163	15,909	1,467
Total hectares/ cropping businesses*	17	1	130	29	526	187	673	217	7,488,892	36,120

Note \* includes other livestock/ crops and businesses not in the categories listed

Source: Commonwealth of Australia (2012), Agricultural Commodities, Australia 2010-11 (Catalogue number 7121.0)

**Table 4-14 : Value of agricultural production, 2011**

Agricultural commodity	Penrith LGA		Liverpool LGA		NSW	
	Value of agricultural production (\$)	Proportion of agricultural production (%)	Value of agricultural production (\$)	Proportion of agricultural production (%)	Value of agricultural production (\$)	Proportion of agricultural production (%)
<b>Livestock</b>						
Beef cattle	815,596	1.0	3,063,473	4.2	1,616,146,834	13.9
Dairy cattle	681,589	0.8	6,742,770	9.2	504,688,534	4.3
Chickens for eggs	25,820,703	31.1	2,734,084	3.7	193,831,797	1.7

Agricultural commodity	Penrith LGA		Liverpool LGA		NSW	
	Value of agricultural production (\$)	Proportion of agricultural production (%)	Value of agricultural production (\$)	Proportion of agricultural production (%)	Value of agricultural production (\$)	Proportion of agricultural production (%)
Poultry for meat (incl chicken, duck, turkey)	30,127,755	36.2	36,335,618	49.5	685,989,465	5.9
Pigs	-		243,017	0.3	166,206,948	1.4
Sheep lambs	3,467	0.0	275	0.0	609,761,626	5.2
<b>Cropping</b>						
Hay	264,362	0.3	40,372	0.1	283,630,872	2.4
Broadacre crops – cereal crops	-	-	205,933	0.3	3,508,940,995	30.1
Broadacre crops – non cereal crops	687	0.0	11,454	0.0	1,857,891,918	16.0
Fruit and nuts (excl grapes)	354,427	0.4	345,752	0.5	454,535,144	3.9
Fruit and nuts – grapes	1,407	0.0	-		142,676,426	1.2
Cut flowers	308,621	0.4	2,483,466	3.4	55,568,825	0.5
Cultivated turf	2,848,129	3.4	89,352	0.1	81,741,568	0.7
Nurseries	3,137,558	3.8	858,443	1.2	174,296,227	1.5
Vegetables	18,778,251	22.6	20,287,681	27.6	445,321,248	3.8
Total	83,147,926		73,445,638		11,639,993,575	

Source: NSW Trade and Investment (undated), Value of Agricultural Production Data 2006-2011 – interactive spreadsheet (based on 2005-06 and 2010-11 Agriculture Census – data cubes from ABS CD)

### Leppington Pastoral Company

The Leppington Pastoral Company (LPC) operates a dairy farm and organic fertiliser business on about 540 hectares of land at The Northern Road, Bringelly (known as LPC Base Farm). The farm comprises areas used for water storage (65 hectares), dryland farming (239 hectares), irrigation (160 hectares), and associated utilities such as housing, sheds, silage pits and irrigation infrastructure (38 hectares). The property also accommodates a number of residences and workers accommodation cottages.

The dairy milks over 2,000 cows on a 24 hour, 7 day a week basis and produces about 68,500 litres of milk daily. The dairy operations also include the rearing of calves born on the farm or nearby properties associated with the LPC. Dairy infrastructure on the farm covers about 14 hectares and comprises two free stall barns, dry weather exercise lots, milking centre, effluent treatment ponds and calf rearing sheds and pens. Wastewater from the dairy operations is used for irrigated cropping areas covering about 200 hectares. The LPC also offers educational tours of the dairy for senior school students throughout the year.

In addition to the dairy, the LPC Base Farm incorporates an organic fertiliser business, which uses manure generated from onsite farming operations and off-site poultry farms to produce organic fertiliser.

#### 4.4.3 Local businesses

##### Businesses in the study area

There were 3,495 registered businesses in the study area in June 2015 (refer to **Table 4-15**). Construction had the most businesses accounting for about 27.2 per cent of all businesses in the study area. This was followed by transport, postal and warehousing (12.0 per cent); and rental, hiring and real estate services (9.6 per cent).

Agriculture, forestry and fishing related businesses accounted for 8.0 per cent of businesses in the study area. Badgerys Creek-Greendale had the largest number of agriculture, forestry and fishing businesses, accommodating nearly 70 per cent of agricultural, forestry and fishing related businesses in the study area. Agricultural, forestry and fishing related business comprised about 13.7 per cent of total businesses in Badgerys Creek-Greendale and 7.2 per cent of businesses in Mulgoa-Luddenham-Orchard Hills.

There were 65 tourism related businesses in the study area, providing accommodation and food services. This represented about 1.9 per cent of total businesses in the study area. Glenmore Park-Regentville had the highest number of accommodation and food services businesses within the study area.

**Table 4-15 : Businesses by industry, 2015 (%)**

Industry	Glenmore Park-Regentville	Mulgoa-Luddenham-Orchard Hills	Badgerys Creek-Greendale	Study area
Agriculture, forestry and fishing	1.0	7.2	13.7	8.0
Mining	0.0	0.0	0.0	0.0
Manufacturing	3.5	2.8	4.6	3.7
Electricity, gas, water and waste services	0.3	0.9	0.5	0.5
Construction	26.3	29.4	26.1	27.2
Wholesale trade	2.1	2.9	4.7	3.4
Retail trade	4.7	4.7	3.9	4.4
Accommodation and food services	2.4	1.6	1.6	1.9

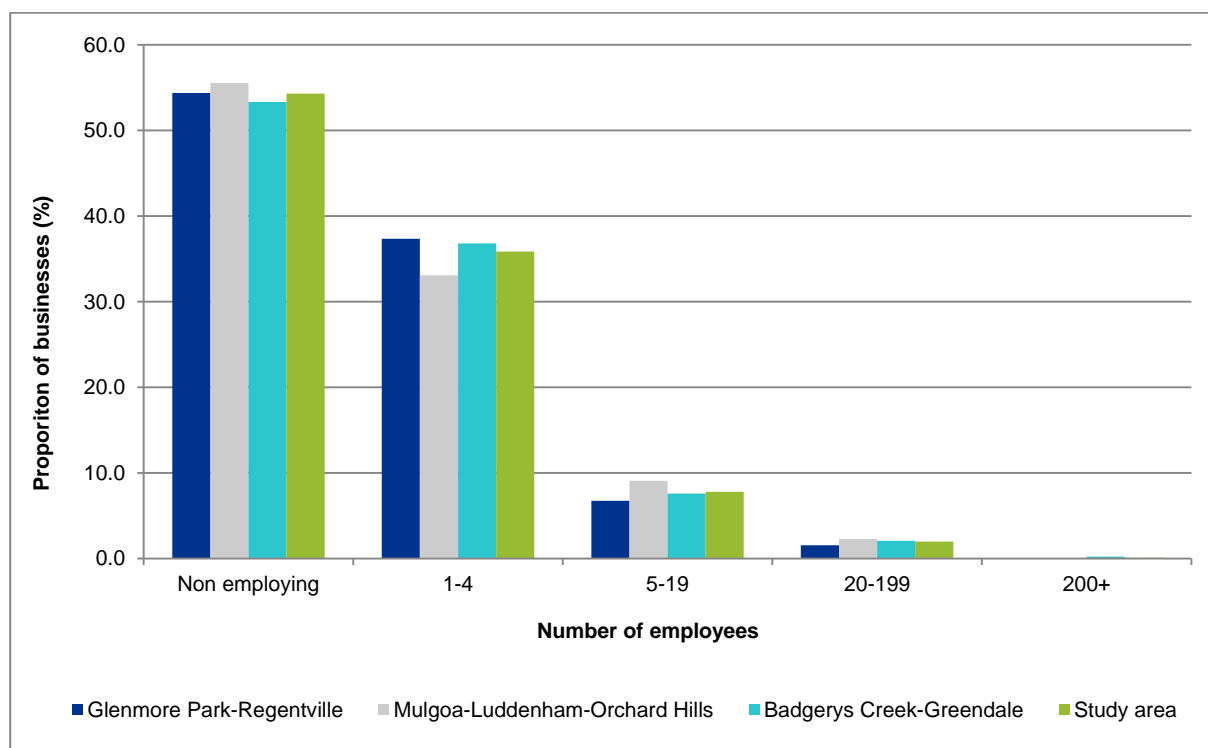
Industry	Glenmore Park-Regentville	Mulgoa-Luddenham-Orchard Hills	Badgerys Creek-Greendale	Study area
Transport, postal and warehousing	10.1	11.6	13.8	12.0
Information media and telecommunications	0.3	0.8	0.2	0.4
Financial and insurance services	8.1	6.1	3.7	5.7
Rental, hiring and real estate services	7.1	12.2	9.5	9.6
Professional, scientific and technical services	11.0	6.6	5.2	7.4
Administrative and support services	6.0	2.4	2.6	3.5
Public administration and safety	0.9	0.6	0.2	0.5
Education and training	1.6	1.1	0.8	1.1
Health care and social assistance	6.1	3.5	1.6	3.5
Arts and recreation services	1.8	0.8	1.1	1.2
Other services	5.2	3.8	4.2	4.4
Currently unknown	1.6	1.1	1.9	1.6
Total	1,039	1,046	1,410	3,495

Source: ABS (2016b), 81650 Counts of Australian Businesses, including Entries and Exits, Jun 2011 to Jun 2015 (Catalogue number 81650)

In June 2015, about 97.9 per cent of businesses in the study area comprised small businesses employing less than 20 people (refer to **Figure 4-7**). About 54.3 per cent of businesses comprised non-employing businesses (sole proprietorships and partnerships without employees), while 35.9 per cent had 1-4 employees, and 7.8 per cent had 5-19 employees. About 2.0 per cent of businesses (69 businesses) employed between 20 people and 200 people. The study area had a very small number of large businesses, employing 200 people or more. These were located in Badgerys Creek-Greendale and generally included manufacturing businesses.



Figure 4-7 : Business size – employees, 2015



Source: ABS (2016b), 81650 Counts of Australian Businesses, including Entries and Exits, Jun 2011 to Jun 2015 (Catalogue number 81650)

Businesses with an annual turnover of between \$200,000 and \$500,000 comprised the largest group, representing about 23.7 per cent of businesses in the study area. Businesses with an annual turnover of less than \$50,000 comprised the second largest group, followed by businesses with an annual turnover of between \$100,000 and \$200,000. There were 175 businesses in the study area that had an annual turnover of \$2 million or more, representing about 5.0 per cent of businesses in the study area. Construction had the largest number of businesses with a turnover above \$2 million, followed by transport, postal and warehousing; and wholesale trade.

### Local businesses near the project

A number of businesses are located near the project that may experience changes from the construction and/or operation of the project. Information on each of these businesses is provided in **Table 4-16**.

Table 4-16 : Local businesses near the project

Locality	Business	Industry category	Comment
Glenmore Park	Carlo Ranieri & Associates	Building construction (residential building construction)	Home based business in building construction services.
	Penrith Golf and Recreation Club	Sport and recreation activities (sports and physical recreation activities)	An 18-hole private golf course. The clubhouse and off-street car park is located immediately north of Glenmore Parkway. The car park provides parking for more than 50 vehicles. Access to the clubhouse and car park is via left-in access only and left and right out access.

Locality	Business	Industry category	Comment
Orchard Hills	Vic's Produce and Pet Centre	Other store based retailing	This business has been operating for over 10 years and provides a range of pet, gardening and rural supplies. The business provides off-street parking for up to about 20 cars, with direct left-in/ left-out access from The Northern Road.
	Orchard Hills Golf Club	Sports and recreation	This is a private nine-hole golf course located within the Defence Establishment Orchard Hills site (i.e. is situated within Commonwealth land). Membership of the golf club is open to members of the public.
Mulgoa	Eireka Pty Ltd	Farm equipment supplier	The home based business provides new and used equipment to the construction, agricultural, forestry and mining industries. Access to the business is provided from Kings Hill Road. All movement access is provided at Kings Hill Road and The Northern Road intersection.
	Classic Wedding Carriages	Limousine service	The home based business provides wedding car hire. Access to the business is provided from Kings Hill Road. All movement access is provided at Kings Hill Road and The Northern Road intersection.
	Stones Kart Sport	Car repair shop	The home based business has been operating for about 27 years and provides services to karts. Access is provided from Longview Road, with all movement access provided at the intersection of Longview Road and The Northern Road.
	Warratah Park Puppies	Dog breeders	Home based business breeding and raising puppies. The business sells puppies across Australia and overseas. All movement access is currently provided to The Northern Road.
	Complete roofing	Roofing service	The home based business has been operating for over 30 years and provides a range of roofing services. All movement access is currently provided to The Northern Road.
	GRS towing	Other transport	Towing business with associated dwelling on the site. All movement access is provided to The Northern Road.
	Seigokan Academy Australia	Sports and recreation activities	Instruct karate classes. Off street parking is provided for up to about 20 cars. All movement access is provided from The Northern Road.

Locality	Business	Industry category	Comment
	Horse N Around	Retail (recreational goods) Other livestock farming	This business has been operating for about 25 years. It offers a range of horse riding products, stables horses (overnight and long-term) and hires an obstacle course .  The business provides off-street parking for about five cars. Dual access is provided from Littlefields Street, with all movement access at the intersection of Littlefields Street and The Northern Road.
Luddenham	The Honey Shed	Agriculture (other livestock farming)	Comprises honey production and retail outlet. The business is visited by a number of international and domestic tourists, including about 2-4 tour buses each month. All movement access is provided to The Northern Road.
	A L Tours	Other transport (scenic and sightseeing transport)	Home based business, providing guided tours and bus charter services. At the same property as A & M Excavations.
	A & M Excavations/ Leonello Plant Hire	Equipment hire	Home based business. Excavation and earth moving contractors and equipment hire. At the same property as A L Tours.
	Cut Your Own Christmas Trees (Top Shape Live Christmas Trees)	Nursery and floriculture production	Grow and sell Christmas trees on site. All movement access is provided from The Northern Road.
	Luddenham Pet Meats	Meat product manufacturing	The business is a pet food supplier that has been operating for 50 years.  Business associated with residential use. Dual access is from The Northern Road, with all movement access provided.
	Triple A Christmas Tree Farm	Nursery and floriculture production	The business is located within Luddenham town centre. An area used for tree growing is located at Eaton Road south of Luddenham town centre.
	Shell service station	Retail trade (service station)	The service station is located on a property comprising the service station, supermarket, café and takeaway, and speciality retail and personal services. The business has been operating for over six years. Direct access is provided to The Northern Road
Bringelly	LPC Base Farm	Dairy cattle farming	Dairy farm and organic fertiliser business on about 540 hectares of land. Further information on the LPC Base Farm is provided in <b>section 4.4.2</b> .
	Grassington Alpacas	Agriculture (livestock farming)	Alpaca Stud.
	Southern Cross Truck Rentals	Vehicle hire	Truck hire company. Access is provided to Dwyer Road, with all movement access at

Locality	Business	Industry category	Comment
			the Dwyer Road and The Northern Road intersection.

### Businesses within Luddenham town centre

As indicated in **section 2.2.1**, two separate surveys were conducted to gather information on local businesses within Luddenham town centre and the wider study area. A range of businesses are located within Luddenham that service the needs of local and regional communities, including:

- Grocery retailers, including supermarket, fruit and vegetable stall, and butcher
- Other retailers, such as pharmacy, newsagent and post office, workwear supplier and florist
- Food services, including cafes, restaurants, bakery and takeaway
- Service stations
- Personal service providers, such as hairdressers and beauty salons
- Health and medical services.

The majority of businesses surveyed had operated within Luddenham for more than six years, with three businesses indicating that they had been operating for more than 20 years. Most businesses employ up to about five people, with one indicating they employed 21-50 people.

Most of the businesses surveyed indicated that they served a predominantly 'local' catchment within about 20 km of Luddenham. The main areas identified by businesses included:

- Bringelly, Harrington Park, Oran Park, Narellan and Gregory Hills south of Luddenham
- Penrith and Glenmore Park to the north
- Mulgoa, Wallacia, Warragamba, Silverdale and the Blue Mountains west of Luddenham
- Twin Creeks and Liverpool to the east.

However, some businesses also indicated that they attracted customers from across greater Sydney and Wollongong. The number plate survey generally confirmed this feedback.

**Table 4-17** shows the top 10 suburbs of origin for customers of businesses in Luddenham town centre, while **Figure 4-8** shows the broader distribution of suburbs of origin. The survey found that businesses within the town centre attract customers from across the greater Sydney area, although the majority of customers generally come from suburbs within about 20 km of Luddenham. Luddenham accounted for about 12.6 per cent of customers who drove to businesses in the town, with the next most popular suburbs of origin being Bringelly (6.5 per cent) and Silverdale (6.1 per cent).

The median distance travelled by customers of businesses within Luddenham town centre was about 18 km. About six per cent of customers lived further than 100 km from Luddenham. About 23 per cent of customers of businesses in Luddenham surveyed were from suburbs located east of Luddenham, with a further 8.9 per cent from suburbs located either south-east or north-east. Customers from suburbs north of Luddenham comprised about 17.1 per cent, while customers from localities to the south comprised about 14.7 per cent.

**Table 4-17 : Top 10 suburbs of origin identified by car park (number plate) survey**

Locality	Proportion of cars counted (%)	Approximate distance (km)
Luddenham	12.6	-
Bringelly	6.5	8.0
Silverdale	6.1	12.4

Locality	Proportion of cars counted (%)	Approximate distance (km)
Wallacia	4.4	5.8
Mulgoa	2.7	9.0
Penrith	2.4	17.8
Glenmore Park	2.0	16.6
Rossmore	1.7	11.7
St Marys	1.7	20.2
Warragamba	1.7	11.3

Source: Car park (number plate) survey conducted by Jacobs. Suburb information from Roads and Maritime.

'Passing trade' generally refers to customers who access a business because they see it while they are walking or driving past, as opposed to customers who have deliberately planned to use a particular business. In general, the level of reliance of a business on passing trade is likely to be influenced by the type or nature of the business. For example, passing trade is likely to be of higher importance for businesses such as service stations and some takeaway food stores and cafes, compared to speciality retail or personal service businesses.

In relation to businesses within Luddenham town centre, passing trade was identified as important to a number of businesses surveyed, although perceptions about the importance of passing trade varied between individual businesses and was not consistent between similar business types. For example, two grocery retail outlets indicated that passing trade comprised less than 10 per cent of their business, while another indicated that this was between about 25-50 per cent.

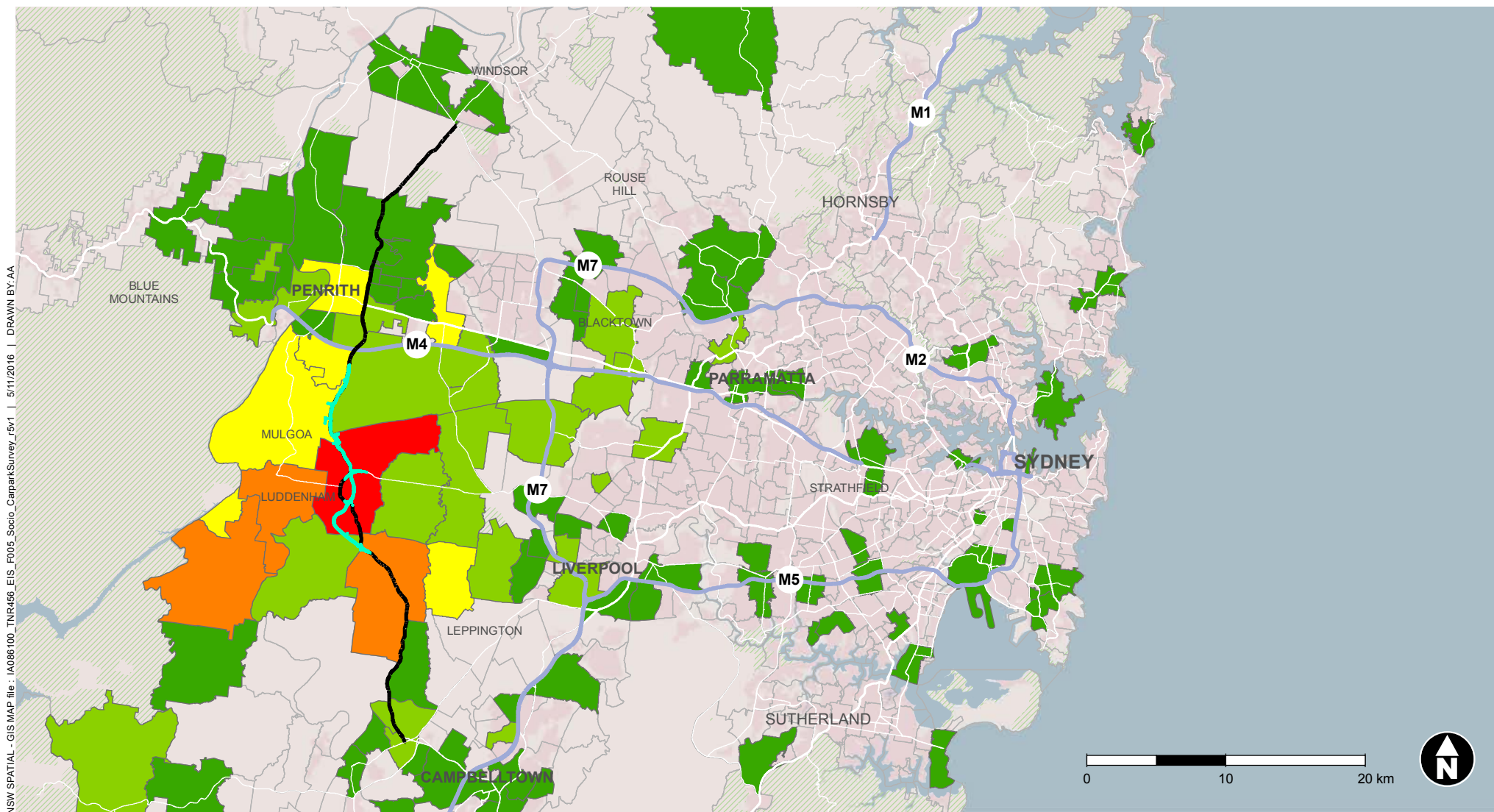
The survey identified that:

- Businesses that indicated passing trade made up a relatively small proportion of their customers (that is, less than 10 per cent) included health care, beauty salon, grocer and food store.
- Businesses that estimated between 10 per cent and 25 per cent of their customers were associated with passing trade included personal services and speciality retail
- Businesses that indicated that passing trade accounted for up to 50 per cent of customers included grocer and food stores and retail uses (for example, newsagent and clothing/ footwear store).










Business such as the service stations and cafes, estimated that more than half of their customers were associated with passing trade, with one business indicating that more than 75 per cent of customers related to passing trade. This business also indicated that the proportion of customers from passing trade was higher on weekdays than on weekends.

Feedback from the survey indicated that for some businesses, many customers were people who came to Luddenham for other services or businesses, such as the fruit shop, supermarket or schools.

The existing business environment of the study area is expected to change over time due to such things as the development of the Western Sydney Airport and urban growth and development. This is likely to result in the diversification of businesses within the study area and broader region and changes to existing businesses and industries. Increased population density around centres is also likely to drive demand for local services and changes to local business.



### Legend

	The Northern Road upgrade - Mersey Road to Glenmore Parkway		Reserves and parklands	Origin of customers (% of cars recorded)		1.6% - 3.0%
	The Northern Road (Existing)		Built areas			3.1% - 7.5%
			Suburb boundaries			7.6% - 12.6%
						0.3%
						0.4% - 1.5%

**Figure 4-8** | Origin of customers in Luddenham identified through the carpark survey



## 4.5 Community values

Community values include those values held as important to residents for quality of life and well-being. Local amenity and character in the study area is mainly influenced by rural land uses, including agriculture and rural residential uses, as well as local towns such as Luddenham and Mulgoa.

Rural uses at Orchard Hills, Luddenham, Mulgoa, Badgerys Creek and Greendale comprise a range of agricultural pursuits including market gardens, dairy, poultry farms, hobby farms, and fruit growing. These uses and rural landscapes are important to the character and identity of the study area and the amenity and lifestyle offered by these uses are valued by local communities. Protecting Penrith's unique scenery and its mix of urban and rural landscapes was identified as a priority during engagement on the Penrith Community Plan (Penrith City Council, 2010), while protecting and preserving Liverpool's heritage, including its rural landscape was identified as a key strategy in Growing Liverpool 2031 (Liverpool City Council, 2013). The study area has experienced an increase in the number of hobby farms and rural residential uses over recent years, which offer residents lifestyle options that bring together the 'country feel' of rural areas, within easy access to urban services and facilities.

As indicated in section 4.4.2, agriculture is also an important contributor to the Penrith and Liverpool economies, supporting local business and employment. Supporting agriculture and local food production as a significant contributor to the region's economy was identified as a key strategy for the Penrith Community Plan (Penrith City Council, 2010). The study area has undergone change in recent decades, with the increasing urban development and development of residential estates such as Glenmore Park. These areas offer residents a range of urban residential uses, as well as access to open space, recreation and conservation areas. Proposed development of a Western Sydney Airport is also likely to drive further growth in urban development in the study area and wider region over the coming years. Increasing urban development has resulted in the loss of agricultural land within the study area, which is likely to continue over time. Managing the loss of this agricultural land will be important in maintaining community values associated with these uses. Ensuring development is appropriately supported by roads and infrastructure was identified as important during consultation on the Penrith Community Plan (Penrith City Council, 2010).

Protection and conservation of the environment, biodiversity and natural assets such as rivers, creeks, and bushland areas is also important to communities in the study area, as is protection and respect of the area's heritage values. Consultation for the project identified the need to give consideration to The Cumberland Conservation Corridor and Aboriginal heritage needs. Community concerns relating to potential changes in air quality and noise levels were also identified. In particular, consultation identified that some people had moved to the area for its 'quiet rural life'. Potential increased noise from the project is likely to be a concern.

Protecting the area's heritage and 'heritage nature' were also identified as important during consultation for the project. This included buildings such as churches and other community facilities such as the Luddenham Showgrounds.

Maintaining high levels of access and connectivity is valued by communities, with community members identifying issues around traffic flow and congestion, maintenance of local roads to cope with increased traffic and ensuring infrastructure keeps up with growth and the airport as being key issues during consultation on the Penrith Community Plan (Penrith City Council, 2013). The need for improved public transport, walking and cycling opportunities were also identified during consultation on Liverpool City Council's *Growing Liverpool 2023* strategy (Liverpool, 2013). Support for improved road and public transport access was also reflected in consultation for this project, along with the need for improved cycling and pedestrian access. Consultation for the project also identified access for people with disability as important, with the need to ensure sufficient time is allowed for people with disability with crossing roads raised as an issue. This was also raised as a key issue in consultation on the Penrith Community Plan (Penrith City Council, 2013).

The importance of a balanced local economy, local employment and creating jobs to keep the community working locally were identified through previous planning and consultation by Penrith and Liverpool councils as key issues in planning for the future. Securing infrastructure that improves economic opportunities for existing and new businesses and the efficient movement of freight are important to building a strong economy (Penrith City Council, 2013).

As indicated in **section 4.3.1**, the study area generally had relatively low levels of population mobility, particularly in rural areas such as Mulgoa-Luddenham-Orchard Hills. Consultation for the project also identified strong family heritage and connections to the study area with some families having lived in the area over several generations. In particular, some rural properties have been held by the same families over several generations.

The existing amenity of communities along The Northern Road are currently impacted by traffic, including heavy vehicles, impacting noise, air quality, visual amenity and safety for pedestrians, cyclists and motorists. In particular, the character, and amenity and public realm of Luddenham town centre is influenced by traffic volumes through the town, impacting local access and connectivity, and the local environment for residents, businesses and visitors.

## 4.6 Social infrastructure

### 4.6.1 Social infrastructure in the study area

A number of regional and state level community services and facilities are located within the Penrith and Liverpool LGAs that cater for communities in the study area as well as in the broader western Sydney region. These include:

- Major hospitals such as Nepean public and private hospitals at Penrith, and Liverpool Hospital at Liverpool
- Tertiary education facilities, including University of Western Sydney campuses at Kingswood and Werrington, TAFE Western Sydney Institute – Nepean College campuses at Kingswood and Penrith; TAFE South Western Sydney Institute – Liverpool College
- Regional, state and national sport and recreation facilities, such as Penrith Lakes Regional Park, including Sydney International Regatta Centre and Penrith Whitewater Stadium; Nepean Aquatic Centre; Penrith Park, including Penrith (Pepper) Stadium and Howell Oval; and Western Sydney Parklands, including Sydney International Shooting Centre, Eastern Creek International Raceway and Sydney International Equestrian Centre
- Major retail, commercial uses, cultural and community support facilities located in the Penrith and Liverpool CBDs.

The study area also includes a range of community facilities and services that principally cater for communities in the study area or surrounding region. These are listed in **Table 4-18**. Facilities located adjacent to the project are described in **section 4.6.2**.

**Table 4-18 : Social infrastructure in the broader study area**

Type of facility	Facility	Location
Cultural facilities	Glenmore Park Anglican Church	William Howell Drive, Glenmore Park
	Padre Pio Parish Glenmore Park	William Howell Drive, Glenmore Park
	Jehovah's Witness Kingdom Hall	Homestead Road, Orchard Hills
	Luddenham Uniting Church	The Northern Road, Luddenham
	St James Anglican Church	The Northern Road, Luddenham
	Catholic Church	Willowdene Avenue, Luddenham
	Sacred Heart Luddenham-Warrangamba Parish, Holy Family Centre Luddenham	Willowdene Avenue, Luddenham
	Floribunda Community Centre	Floribunda Avenue, Glenmore Park
Education facilities	University of Western Sydney Farm	Greendale Road, Greendale
	Regentville Public School	Schoolhouse Road, Regentville
	Bethany Catholic Primary School	William Howell Drive, Glenmore Park

Type of facility	Facility	Location
	Caroline Chisholm College	The Lakes Drive, Glenmore Park
	Glenmore Park High School	Glenmore Parkway, Glenmore Park
	Glenmore Park Public School	The Lakes Drive, Glenmore Park
	Surveyors Creek Public School	St Andrews Drive, Glenmore Park
	Penrith Anglican College	Wentworth Road, Orchard Hills
	Luddenham Public School	The Northern Road, Luddenham
	Holy Family Primary School	Willowdene Avenue, Luddenham
	Mulgoa Public School	Mulgoa Road, Mulgoa
	Nepean Christian School	Mulgoa Road, Mulgoa
	Bringelly Child Care Centre	Francis Street, Bringelly
	Luddenham Child Care Centre	The Northern Road, Luddenham
	Mulgoa Pre-school	St Thomas Road, Mulgoa
	Glenmore Park Child and Family Centre	Blue Hills Drive, Glenmore Park
	Kids World Kindy	Kiber Drive, Glenmore Park
	Kids Academy Glenmore Park	Woodlands Drive, Glenmore Park
	The Little Kids School	Wolara Avenue, Glenmore Park
	Explore and Develop Glenmore Park	Candlebark Circuit, Glenmore Park
	Kids Academy Regentville	Factory Road, Regentville
Health, medical and emergency services	Mulgoa Fire Station	Mulgoa Road, Mulgoa
Sport, recreation and leisure facilities	Luddenham Showground	Park Road, Luddenham
	Sales Park	Roots Avenue, Luddenham
	Mulgoa Nature Reserve	Glenmore Park
	Apple Gum Reserve	Lady Jamison Drive, Glenmore Park
	Rotary Park	Floribunda Avenue, Glenmore Park

#### 4.6.2 Social infrastructure near the project

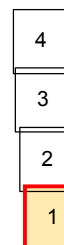
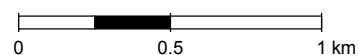
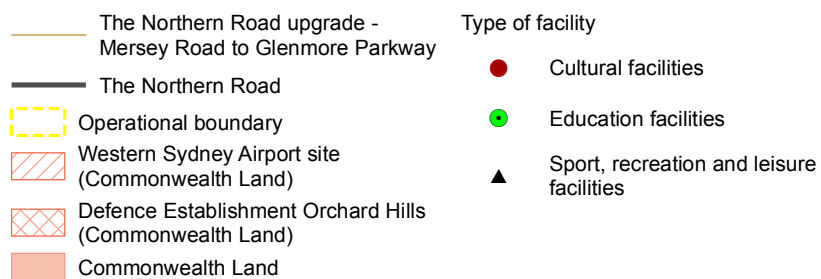
Some community facilities and services are located next to the project that may be subject to direct or indirect impacts from the construction and/ or operation of the project. Social infrastructure near the project is described in **Table 4-19** and shown in **Figure 4-9**.

**Table 4-19 : Social infrastructure near the project**

Facility type	Facility	Location	Description
Education facilities	Penrith Anglican College	Wentworth Road, Orchard Hills	The school offers primary and secondary education for students in Kindergarten to Year 12. In 2015, the school had an enrolment of 1,236 students. The school provides after hour care for students until 6.00pm. The Junior School Performing Arts Centre (the Lighthouse Theatre) is located at the school. It includes a 550 seat theatre

Facility type	Facility	Location	Description
			and associated café, which is used for College and professional productions, for example play and music concerts. The theatre is also home to Christ Church @ the College, which holds services at 9.30am each Sunday.
Sport, recreation and leisure facilities	Penrith Golf and Recreation Club	The Northern Road, South Penrith	An 18-hole private golf course. The clubhouse is located near to The Northern Road boundary. Access to the clubhouse is via left-in access only and left and right out access.
	Orchard Hills Golf Club	The Northern Road, Orchard Hills	Golf course is located in the Defence Establishment Orchard Hills (i.e. is situated within Commonwealth land).
	Surveyors Creek Nature Reserve	Glenmore Park	The reserve provides informal recreation opportunities, including fitness trail and nature based recreation. Formal recreation facilities and a community centre is also located at the northern part of the reserve.
	Windmill Park	Saddler Way, Glenmore Park	The park provides informal recreation opportunities, including playground and open space areas.



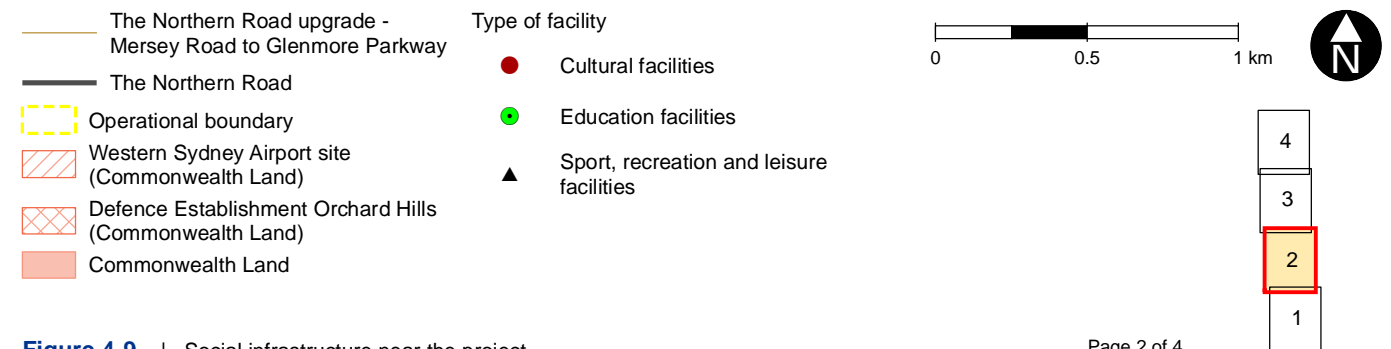


**Figure 4-9** | Social infrastructure near the project

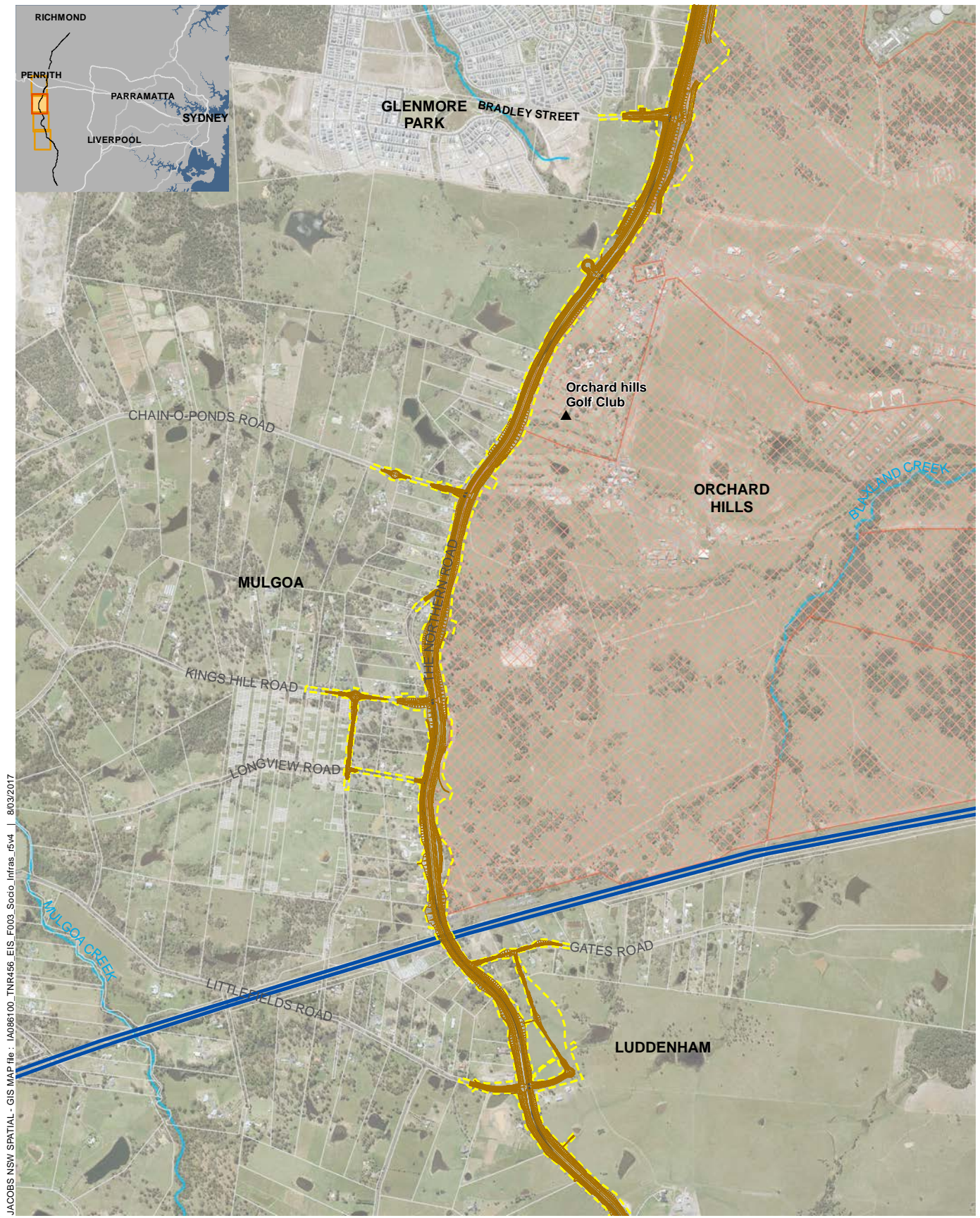




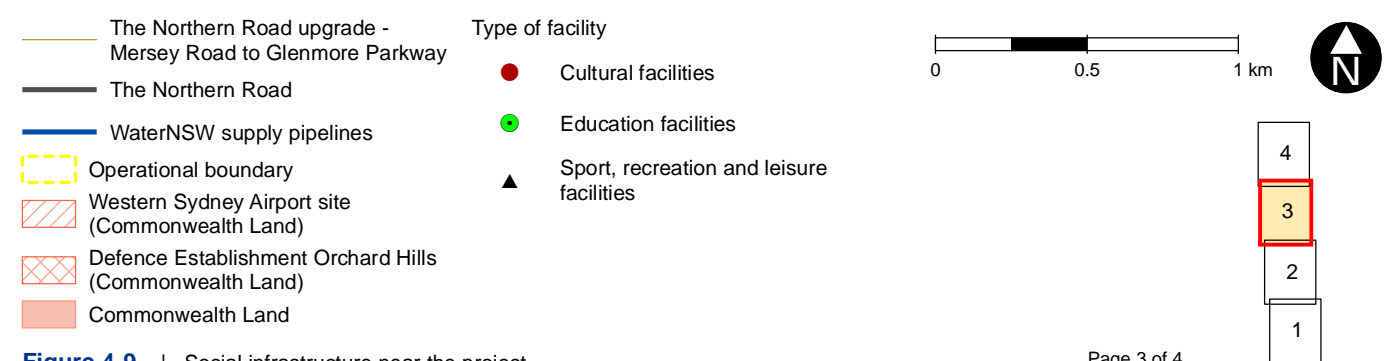
JACOBS NSW SPATIAL - GIS MAP file : I:\0086100\_TNR456 EIS\_F003 Socio Infras\_Page2\_r5v4 | 8/03/2017





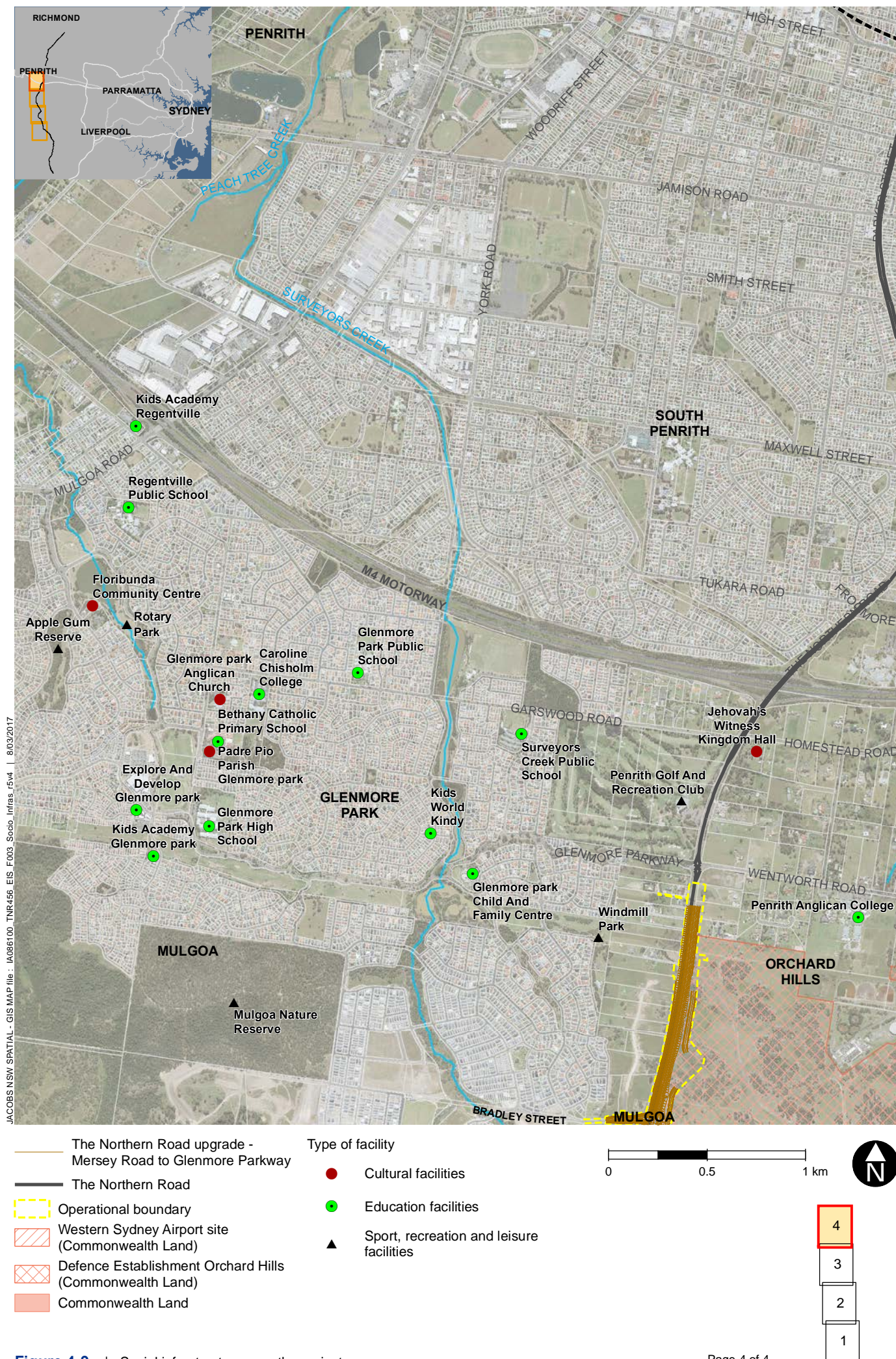


JACOBS NSW SPATIAL - GIS MAP file: \JA086100\_TNR456\_EIS\_F003\_Socio\_Infras\_5v4 | 803/2017



**Figure 4-9** | Social infrastructure near the project







## 4.7 Transport and access

### 4.7.1 Transport infrastructure and facilities

The study area is serviced by a range of transport infrastructure and facilities, including major roads, public transport and active transport.

#### Roads

The Northern Road is a key north-south connection, linking Richmond Road and South Windsor in the north with Camden Valley Way at Narellan in the south. The road provides an important radial connection across western Sydney for residents, business and industry.

Locally, The Northern Road provides access to residential, rural and commercial properties along The Northern Road and in surrounding areas. Right turn access is currently provided to/ from properties fronting The Northern Road and at intersections with The Northern Road.

Other key roads servicing the study area include:

- Mulgoa Road, which is a north-south route located west of The Northern Road and connecting High Street at Penrith with Park Road at Wallacia
- The M4 Motorway, which connects the Blue Mountains with Parramatta Road at Strathfield, providing an important connection between the Sydney CBD and western Sydney for residents, business and industry
- Elizabeth Drive, which is an east-west route, connecting the Hume Highway at Liverpool with The Northern Road at Luddenham. The road provides a connection between the Sydney CBD and western Sydney for residents, business and industry
- Badgerys Creek Road, which is a north-south corridor connecting The Northern Road at Bringelly with Elizabeth Drive at Badgerys Creek.

Further information on roads within the study area is included in the Traffic and Transport Working Paper.

#### Public transport

The study area is serviced by a number of bus routes, of which two services operate along The Northern Road. Only one operates along The Northern Road between Mersey Road and Glenmore Parkway. This is Route 789, which connects Penrith to Luddenham.

A number of school bus routes also connect to schools within the study area, some of which use The Northern Road for part of the route. A number of bus stops are located along The Northern Road between Luddenham and the M4 Motorway.

The Western rail line crosses under The Northern Road to the north of the project area. The rail line connects central Sydney to Emu Plains and further to the Blue Mountains. Stations are located at Kingswood and Penrith.

Further information on public transport services in the study area is included in the Traffic and Transport Working Paper.

#### Active transport

Existing pedestrian and cyclist facilities along The Northern Road are limited. Pedestrian or cycle facilities along The Northern Road between Mersey Road and Glenmore Parkway are generally located within Luddenham.

In relation to local roads that intersect with the project corridor, formal pedestrian facilities are located on Glenmore Parkway, including for a short distance on the northern side, before crossing to the southern side, or within Luddenham. No formal cycling facilities are located on the local roads intersecting with the project corridor. Further information on active transport facilities is included in the Traffic and Transport Working Paper.

#### 4.7.2 Journey to work

**Table 4-20** shows information on travel to work for residents in the study area in 2011. Car travel was the predominant mode of travel to work for residents in the study area, with about 74.3 per cent of people aged 15 years or over using the car for all or part of their journey to work. This is above the regional and NSW averages. Within the study area, Glenmore Park-Regentville had the highest proportion of residents who travelled to work by car. Badgerys Creek-Greendale had the lowest proportion of residents who used a car for all or part of their journey to work, although this was still about the NSW average.

Public transport was used for travel to work by about 7.3 per cent of people in the study area aged 15 years or over. This was well below the NSW average and is likely to reflect the limited public transport access in parts of the study area (for example, Mulgoa-Luddenham-Orchard Hills and Badgerys Creek-Greendale).

Glenmore Park-Regentville had the highest proportion of public transport users, with the majority of these trips taken by train.

About 1.7 per cent of people in the study area aged 15 years or over walked or cycled to work, which was below the NSW average (at 4.8 per cent). This is likely to reflect the more rural nature of the study area and distance to employment centres.

**Table 4-20 : Travel to work, 2011 (%)**

Method of travel	Glenmore Park-Regentville	Mulgoa-Luddenham-Orchard Hills	Badgerys Creek-Greendale	Study area	Penrith LGA	Liverpool LGA	NSW
One method:							
Train only	3.7	1.5	1.2	2.8	5.4	5.7	6.2
Bus only	0.7	0.5	0.5	0.6	0.8	1.6	3.7
Car only (as driver or passenger)	74.2	69.7	65.4	71.4	70.2	69.8	62.6
Other motor vehicle only	1.6	4.9	7.2	3.5	2.5	2.1	1.9
Bicycle only	0.2	0.2	0.1	0.2	0.3	0.3	0.7
Walked only	0.8	2.0	2.9	1.5	1.6	2.2	4.1
Other (one method)	0.3	0.5	0.9	0.5	0.5	0.7	1.0
Two methods:							
Train and car (as driver or passenger)	3.2	1.9	2.0	2.7	2.4	2.7	1.2
Train and one other method	1.0	0.1	0.1	0.7	1.4	1.6	1.6
Bus and car (as driver or passenger)	0.1	0.0	0.2	0.1	0.1	0.2	0.3
Bus and one other method	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Other two methods	0.4	0.4	0.5	0.4	0.4	0.4	0.5
Three methods:							
Train and two other	0.5	0.3	0.1	0.4	0.5	0.5	0.4



Method of travel	Glenmore Park-Regentville	Mulgoa-Luddenham-Orchard Hills	Badgerys Creek-Greendale	Study area	Penrith LGA	Liverpool LGA	NSW
methods							
Bus and two other methods (excl train)	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Other three methods	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worked at home	2.9	7.1	9.5	5.1	2.8	2.5	4.6
Did not go to work	9.2	8.5	6.5	8.5	9.4	7.3	9.5
Method of travel not stated	1.0	2.3	2.6	1.6	1.7	2.2	1.5
Total	11,298	3,336	4,295	18,929	87,227	74,568	3,138,330

Source: ABS (2012a), 2011 Census of Population and Housing, Basic Community Profile (Catalogue number 2001.0)