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Jane Street and Mulgoa Road Infrastructure Upgrade

Review of Environmental Factors

Appendix L – Socio-economic Assessment

October 2016

Jane Street and Mulgoa Road Intersection Upgrade

Socio-economic assessment

Final | 24 August 2016

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 244597-40

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Executive summary

This socio-economic assessment has been prepared for the Jane Street and Mulgoa Road Infrastructure Upgrade Review of Environmental Factors (REF). It has been prepared using Roads and Maritime Services' *Environmental Impact Assessment Practice Note: Socio-economic assessment (EIA-N05).*

Roads and Maritime Services (Roads and Maritime) is proposing to upgrade road infrastructure along Mulgoa and Castlereagh Roads between Museum Drive and Union Road including sections of High Street and Jane Street. This includes upgrading two major intersections (High Street/Mulgoa Road and Jane Street/Mulgoa road) to improve traffic flow from Jane Street to the Great Western Highway (High Street), in the vicinity of the Penrith Central Business District (CBD) and also respond to future growth in traffic due to large residential developments in the Penrith Local Government Area (LGA).

Roads and Maritime has conducted a range of stakeholder and community engagement activities for the proposal to assist with identifying social impacts and benefits. Initial stakeholder consultation, design and traffic modelling identified a number of options to reduce congestion within the proposal site. The preferred option was selected and made available for public comment from November 2014 – February 2015. 23 submissions were received from stakeholders and the community during this public comment period. The issues discussed in these submissions have been taken into consideration in this socio-economic assessment.

To prepare this socio-economic assessment, meetings were also held with Penrith City Council, Ambulance NSW, Lion Dairy, Westfield and the Nepean Tennis Association. At these meetings a draft concept design was shown and feedback on potential impacts was gathered so this could be fed into the REF and ongoing design process.

The socio-economic assessment has identified that construction related impacts will be localised to the study area and its surrounds and are most likely to occur due to traffic and access disruptions and stakeholder specific issues associated with access and construction activity. These items will need to be managed during construction to reduce impacts as much as possible.

Once operational, further socio-economic impacts are not expected, though it is acknowledged that roads and intersections in the area will be larger in scale and 'busyness' may affect the amenity of the area. The upgraded intersections are expected to provide a range of socio-economic benefits including reduced travel times, reduced vehicle stoppages, improved safety for all users, new cycle and pedestrian infrastructure and new urban and landscape design elements to improve amenity as much as possible.

1 Introduction

1.1 Background

According to the NSW Government's *A Plan for Growing Sydney* (Department of Planning and Environment, 2014) Western Sydney is key to Sydney's ongoing economic success. To realise its full potential, the NSW and Australian Governments are investing heavily in infrastructure and services in Western Sydney, including Sydney's second airport at Badgerys Creek, Sydney's second CBD at Parramatta as well as a range of transport infrastructure, education, cultural and health facilities. The North West Priority Growth Area, which includes parts of The Hills, Blacktown and Hawkesbury Local Government Areas, and South West Priority Growth Area, which includes parts of Liverpool, Camden and Campbelltown Local Government Areas, are key focus areas for this growth (Department of Planning and Environment , 2015).

While Penrith is located outside of the State Government's Priority Growth Areas, Penrith is named in *A Plan for Growing Sydney* as one of the Western Sydney's key city-centres, as a place that will benefit from growth in surrounding areas and generate its own economic activity, opportunity and jobs for the people of Western Sydney.

It is predicted that by 2031, Penrith will be home to more than 76,000 new residents, living in 32,700 new dwellings (Department of Planning and Environment, 2015). Penrith aims to provide 40,000 new jobs in a range of industries by 2031 (Penrith City Council, 2013).

Located in Penrith, the Jane Street - Great Western Highway and Mulgoa Road - Castlereagh Road intersections form part of a strategic route in the Penrith and wider Western Sydney region, providing a north-south connection between Richmond and Wallacia and an east-west connection between the Penrith CBD and the Blue Mountains.

These intersections currently experience congestion during morning (AM) and afternoon (PM) peaks. Currently, Mulgoa Road - Castlereagh Road is over capacity northbound and near capacity southbound during the morning peak, and near capacity northbound and southbound during the afternoon peak. As Penrith is a nominated regional centre identified to accommodate future residential and employment growth, it is expected that without any improvement future traffic congestion at the intersections would worsen, resulting in further delays.

To address existing congestion and anticipated population and local employment growth, Roads and Maritime Services (Roads and Maritime) is proposing to upgrade the road infrastructure along Mulgoa and Castlereagh Roads between Museum Drive and Union Road including sections of High Street and Jane Street. This includes upgrading two major intersections (High Street/Mulgoa Road and Jane Street/Mulgoa road) to improve traffic flow from Jane Street to the Great Western Highway (High Street), in the vicinity of the Penrith Central Business District (CBD) and also respond to future growth in traffic due to large residential and jobs growth in the Penrith Local Government Area (LGA).

1.2 Report purpose

The socio-economic assessment (SEIA) has been prepared to inform the Review of Environmental Factors (REF) for the Jane Street and Mulgoa Road Infrastructure Upgrade. The SEIA is required by Roads and Maritime to ensure potential socio-economic impacts have been considered in the proposal's planning phase.

The socio-economic assessment:

> *"…includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, or planned interventions (policies, programs, plans, and projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment"* (Vanclay F. , 2003).

The assessment describes the existing socio-economic environment to provide a basis for predicting likely changes related to the proposal. It then identifies and analyses the likely benefits or impacts of the proposal and assesses the magnitude, duration and likelihood of identified benefits and impacts. It finally identifies mitigation measures to avoid, manage or mitigate potential impacts and enhance the proposal's benefits.

At the time of writing this SEIA, the proposal's design was at the Concept (20 percent) stage.

1.3 Assessment methodology

The SEIA has been prepared in accordance with the Roads and Maritime *Environmental Impact Assessment Practice Note: Socio-economic assessment (EIA-N05)* (the Practice Note). The initial project scoping checklist provided in Table 1 of the Practice Note was used to determine the level of socio-economic assessment required. The proposal is expected to have moderate level impacts that, therefore a 'moderate' socio-economic assessment has been undertaken.

1.4 Data sources used to inform assessment

Information used in this SEIA was drawn from a variety of primary and secondary sources. These include:

- Meetings and discussions with the Roads and Maritime and Arup teams
- Observations gained from site visits
- Discussions with key stakeholders including Penrith City Council, Ambulance NSW, Westfield Penrith, Nepean District Tennis Association and Lion Dairy.
- Records of previous stakeholder and community engagement derived from the project's Consultation Manager database
- Previous Roads and Maritime reports associated with the proposal – such as the Jane Street Extension Preliminary Environmental Investigation (Roads

and Maritime Services, 2014) and Jane Street and Mulgoa Road Infrastructure Upgrade - Display of Preferred Option Community Consultation Report (Roads and Maritime Services, 2015)

- State Government planning documentation, including A Plan for Growing Sydney (Department of Planning and Environment, 2014)
- Penrith City Council planning documentation – including the City Strategy (Penrith City Council, 2013) and DA information
- Data from the Australian Bureau of Statistics – such as 2011 Census data
- Data from the Department of Employment
- Pedestrian count data
- Other technical reports prepared for the proposal.

1.5 Policy context

The SEIA has also drawn on guidance provided by a range of local, State and Federal policies and plans including:

- NSW 2021: A Plan to Make NSW Number One (NSW Government, 2011)
- A Plan for Growing Sydney (Department of Planning and Environment, 2014)
- NSW Long Term Transport Master Plan (Transport for NSW, 2012)
- Contributing to liveable communities: roads as links and places (Roads and Maritime Services)
- Rebuilding NSW: State Infrastructure Strategy (NSW Government, 2014)
- Penrith City Council planning documentation – including the City Strategy (Penrith City Council, 2013) and DA information
- Penrith Local Environment Plan (LEP).

1.6 Study areas

The proposal is located within the Penrith Local Government Area approximately 50km west of Sydney's CBD. The proposal site is located approximately 500m from the Penrith CBD and is shown in orange in Figure 1.

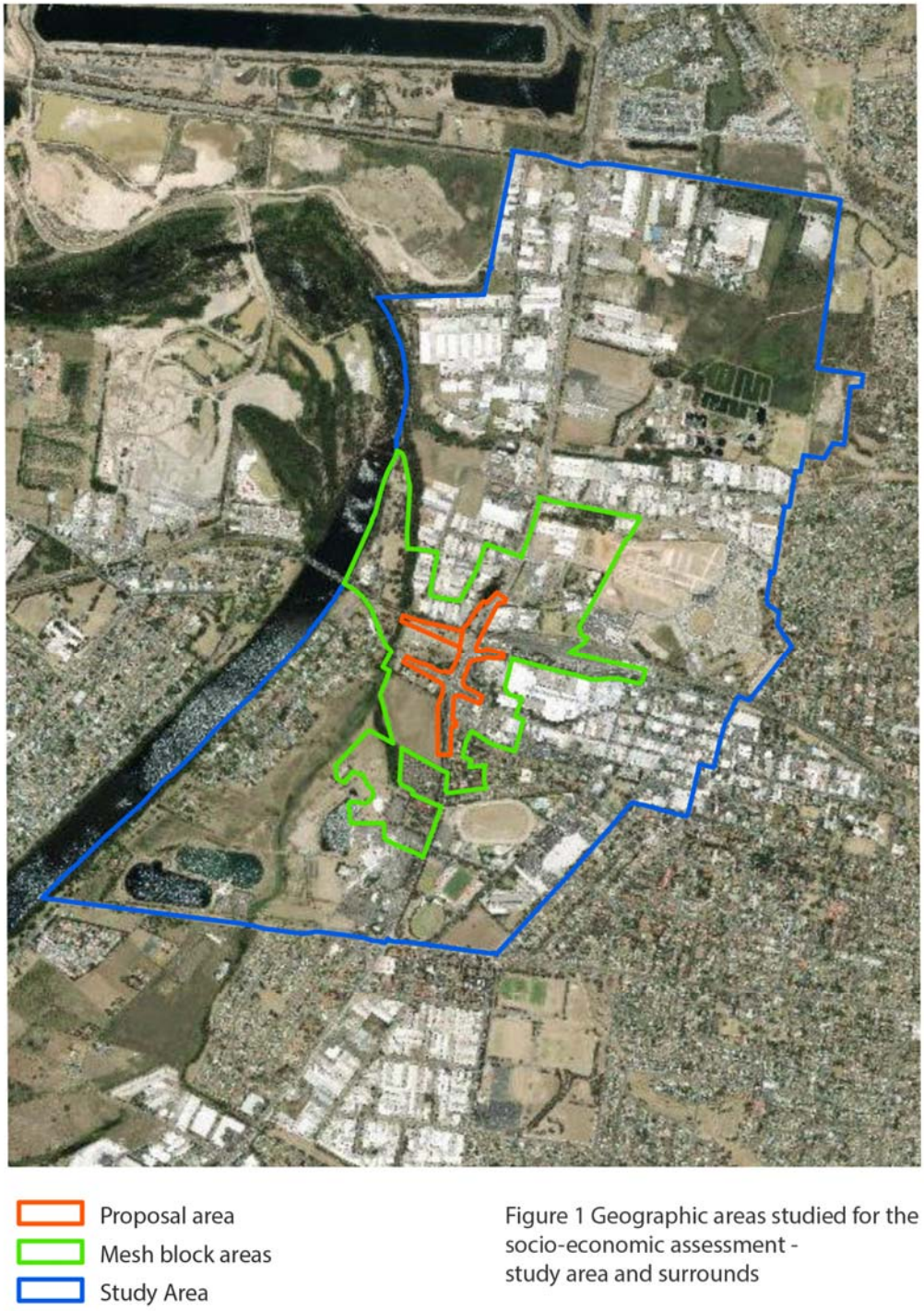
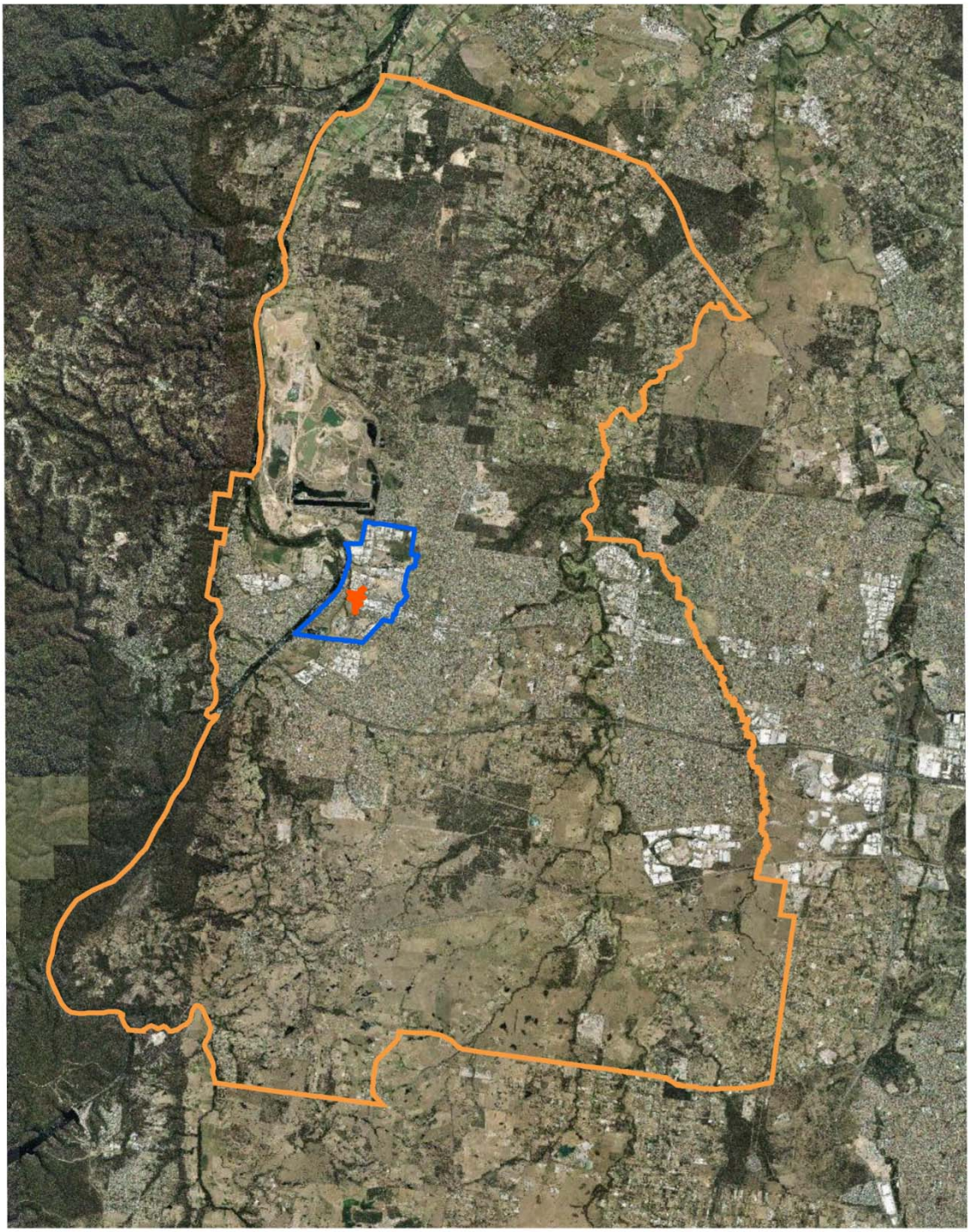


Figure 1 Geographic areas studied for the socio-economic assessment – study area and surrounds

The SEIA utilises a number of geographic areas to describe the socio-economic environment that may be impacted by the proposal. These areas aim to approximate the proposal site, which is shown in red in Figure 1 and include:

- **SEIA study area** – the combination of seven Statistical Area Level 1 (SA1) areas (1146407, 1146423, 1146424, 1146425, 1146426, 1146427, 1146428) to approximate the proposal site. To provide more fine grained population and dwelling data related to the proposal site, ABS Mesh Block areas have also been used where relevant (shown in green in Figure 1) for dwelling and population data
- **Penrith Local Government Area** – defined by the ABS as the Penrith Local Government Area (LGA) – shown in light orange in Figure 2. The proposal site sits within the LGA's boundary. Where relevant, this area has been used for comparative purposes within the SEIA
- **State** – defined by the ABS as the State of NSW (STE). Where relevant, this area has been used for comparative purposes within the SEIA.



Proposal area
Study area
Penrith Local Government Area

Figure 2 Geographic areas studied for the socio-economic assessment - Penrith Local Government Area

Figure 2 Geographic areas studied for the socio-economic assessment – Penrith Local Government Area

1.7 Proposal objectives

The aim of the proposal is to improve traffic flow from Jane Street through to the Great Western Highway at High Street and accommodate anticipated growth in traffic in the Penrith LGA and surrounding regions.

The proposal objectives are to:

- Reduce congestion and delays at the Jane Street/Castlereagh Road and Mulgoa Road/High Street/ Great Western highway intersections during peak hour periods
- Improve the arterial road connection that integrates with the existing road network to meet all road user needs on opening and into the future
- Deliver infrastructure that provides effective network performance for at least minimum term of ten years after opening
- Sustainability
- Improve access to public transport, including buses
- Strengthen integration with land use
- Support economic growth of Penrith as a regional centre
- Improve live-ability
- Contribute to safe and effective pedestrian and cycling infrastructure, within the proposal boundary, between the Nepean River Green Bridge, Penrith Train Station and Penrith city centre that supports local and State Government initiatives for active transport
- To provide the best outcomes within the budget allocation and to deliver a positive BCR
- Provide a safer road environment that reduces the frequency and severity of crashes
- Minimise impacts to the local environment including no adverse flooding impacts, whilst improving opportunities for river access and enhancing urban design.

1.8 Proposal scoping

As outlined in the Practice Note, the initial scoping checklist was used to undertake a preliminary review of potential social and economic issues associated with the proposal. These include:

- Property acquisition
- Changes to the traffic environment for all transport modes
- Changes to property accesses, including properties that facilitate business and social and recreational uses
- Changes to amenity in the proposal site associated with changes to landscape features and implementation of a larger in scale road environment.

2 Description of the proposal

2.1 Current situation

Jane Street is a four-lane arterial road running east–west within the Penrith CBD, extending about 600 m between Belmore Street and Castlereagh Road, parallel to the Western Railway Line. It connects to Castlereagh Road/ Mulgoa Road at a T-intersection. Vehicles travelling west from Jane Street are required to turn left onto Mulgoa Road, travel 125 m and then turn right onto the Great Western Highway. This intersection arrangement and the connecting roads experience congestion, particularly during the morning and afternoon peak times.

High Street runs east–west through the proposal area, connecting to Great Western Highway. Although it connects the eastern and western sections of the Great Western Highway, High Street runs through Penrith CBD providing local access to the CBD which is heavily used by pedestrians. High Street generally has four lanes within the proposal site. This four lane configuration continues onto the Great Western Highway which reduces to two lanes (one in each direction) as it approaches Victoria Bridge.

The Western Rail Line intersects Castlereagh Road at the Castlereagh Road Rail Intersection (also referred to as Penrith Railway Bridge). Castlereagh Road is a two lane divided carriageway until Waterside Boulevard and turns into a four lane carriageway towards Jane Street. The speed limit for the road is 60 km/h. The current bridge structure is a three span open top steel deck bridge with a through girder central span. The total bridge length is approximately 30 m split into three spans of 3.5 m, 17.5 m and 9.5 m.

Mulgoa Road connects Penrith to Wallacia. The road is a four lane carriageway until Glenmore Parkway and turns in a two lane carriageway towards Wallacia. The speed limit for the road is mostly 60 km.

There are currently pedestrian paths on both sides of Mulgoa Road - Castlereagh Road and Jane Street and a pedestrian path running along the westbound carriageway of the Great Western Highway/ High Street. The paths within the proposal site vary in width and provide access to a number of community, recreational and commercial premises.

Within the proposal site, there are off-road separated cycle paths along Mulgoa Road - Castlereagh Road southbound between Museum Drive and Union Road and northbound between the Great Western Highway and Museum Drive, as well as westbound on the Great Western Highway and eastbound on High Street.

2.2 Proposed upgrade

Roads and Maritime Services (Roads and Maritime) propose to upgrade the infrastructure at the Jane Street - Great Western Highway and Mulgoa Road - Castlereagh Road intersections in close proximity to the Penrith (CBD).

The proposal would include the following key features (see Figure 3):

- Widening of Mulgoa Road - Castlereagh Road between Museum Drive and Union Road to allow for six through lanes and auxiliary lanes at intersections
- Upgrading the Mulgoa Road and High Street intersection to provide increased capacity
- Upgrading the T-intersection of Jane Street and Castlereagh Road / Mulgoa Road to provide increased capacity
- Replacement of the existing rail underbridge to allow three lanes of traffic in each direction on Castlereagh Road and a left turn lane into Jane Street. The new bridge will be constructed immediately to the south of the existing bridge, and slid into position during a rail/road possession
- A shared pathway (pedestrian and cycle path) along the eastern side of Mulgoa Road - Castlereagh Road. Including introducing staged pedestrian crossing on Mulgoa Road -Castlereagh Road
- Introducing bus priority ('queue-jump') lane at Jane Street and High Street
- Local realignment and protection of existing utility services including RMS assets.

The proposal forms part of a joint Federal and State Government commitment to improve traffic flow between the Nepean River and Penrith CBD. Strategic design estimates indicate that the proposal could cost about $76 million.

Construction of the proposal would be staged in order to minimise impacts to traffic and rail services.

This infrastructure is necessary to improve traffic flow on this key route and respond to an expected increased travel demand from current and future residential and employment growth in the area.

The proposal would include the use of temporary construction compounds and ancillary facilities. Potential locations include an area between the tennis courts and the rail line and on a parcel of vacant land located to the south west of the High Street and Mulgoa Road intersection, known locally as the 'Carpenters site'.

A number of public utilities would require relocation as part of construction activities. These include:

- Sewerage
- Water supply
- Electricity
- Gas

- Telecommunications
- Roads and Maritime assets – such a traffic lights and loops
- Stormwater drainage.

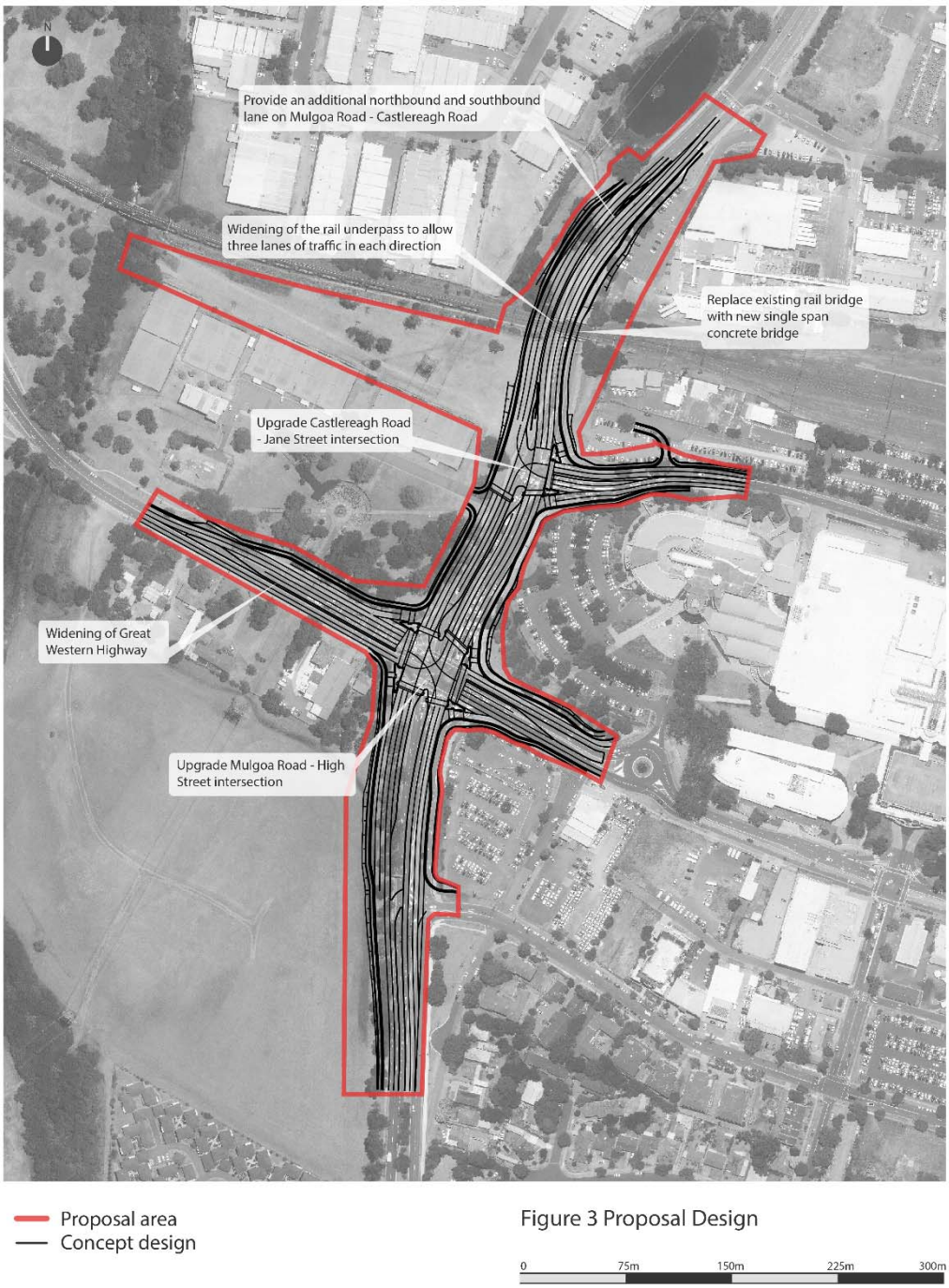


Figure 3 Map showing the proposal's design

3 Existing socio-economic environment

This section of the SEIA provides an overview of the existing conditions within the relevant areas identified in section 1.6. This review has been completed to provide baseline information from which to assess potential impacts on the social and economic environment.

3.1 Population and demography

3.1.1 Population

- According to the 2011 ABS Census data, the population of the study area was 1,502 people. Within Mesh Block areas in the vicinity of the proposal site 316 people were recorded
- At the time of the 2011 Census, the population of the Penrith LGA was 178,467 people. This increased to 203,950 people in 2016 and is projected to grow to 242,150 people by 2021 (Department of Planning and Environment, 2016).

3.1.2 Age

- 12 percent of the population in the study area are aged 14 years or younger compared to 21 percent for NSW population
- 28 percent of the population in the study area are aged 65 years or older compared 10 percent for NSW population
- This data indicates that the study area has a lower percentage of children and higher percentage of 65+ residents than the broader LGA. This is likely due to the Mountain View Aged Care facility and Retirement Village being located in close proximity to the study area.

3.1.3 Cultural diversity

- One percent of people in the study area identify as being of Aboriginal or Torres Strait Islander descent, within the broader NSW population three percent of people identify as such
- 11 percent of the study area's population was not born in Australia compared to 21 percent of NSW's population
- Nine percent of the study area's population indicated that they speak another language at home, similar to the State's average of 11 percent.

3.2 Families and housing

3.2.1 Dwellings

- According to the 2011 ABS Census data, there were 752 dwellings in the study area. 120 of these were located within the Mesh Block areas in the vicinity of the proposal site
- 32 percent of dwellings in the study area were separate houses, 31 percent semi-detached houses, 27 percent were flats/apartments. Across the State, 77 percent of dwellings were separate houses, 10 percent were semi-detached dwellings, eight percent were flats/apartments and five percent were unoccupied
- Ten percent of dwellings in the study area were unoccupied at the time of the 2011 census.

This data indicates a much lower percentage of separate houses in Penrith compared to the State average. This is likely due to the location of the study area adjacent to the Penrith CBD where higher density development is encouraged and the location of the Mountain View Aged Care facility and Retirement Village which is unit/villa based.

3.2.2 Households and families

- There are 672 households within the study area. 49 percent of these households were classified as 'family' households
- The average household size within the study area is 1.9 people. The NSW average is 2.9 people per dwelling.

This data indicates a lower average household size than the broader LGA average. This is again linked to the higher density dwelling types and the location of the aged care/retirement facility.

3.2.3 Housing cost and tenure

- 40 percent of dwellings in the study area were owned outright (compared to 27 percent across NSW), 16 percent were owned with a mortgage (compared to 44 % across NSW) and 40 percent of dwellings were rented (compared to 27 percent across NSW)
- Median monthly mortgage repayments for dwellings in the Penrith LGA was $1,140, lower than the State average of $1,983
- Median monthly rental payments for dwellings in the Penrith LGA was $280, slightly lower than the State average of $300.

3.3 Socio-economic indicators

The Socio-Economic Indexes for Areas (SEIFA) is an index provided by the ABS that summarises different aspects of the socio-economic conditions of people living in an area based on a set of socio-economic data from the Census such as

income, educational attainment, unemployment and dwellings without motor vehicles. It provides a more general measure of socio-economic status than is given by measuring income or unemployment alone. SEIFA for the 2011 Census has been used for this report.

The Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) summarises information about the economic and social conditions of people and households within an area, including both relative advantage and disadvantage measures (Australian Bureau of Statistics, 2013).

As shown in Figure 4, the SEIFA IRSAD index varies in close proximity to the study area. There is an area of relative advantage (8th decile) to the west of the study area located along the Nepean River. Adjacent to this area is an area of relative disadvantage (1st decile). The SEIFA in this area would likely be influenced by the location of the aged care and retirement facilities in this area. To the east of Mulgoa Road there are areas of relative disadvantage (2nd and 4th decile). Other areas in the study area and surrounds have such low populations that the SEIFA in these areas does not provide an accurate indicator of socio-economic status. Areas to the north of the study area do not have resident populations, therefore SEIFA is not available for these areas.

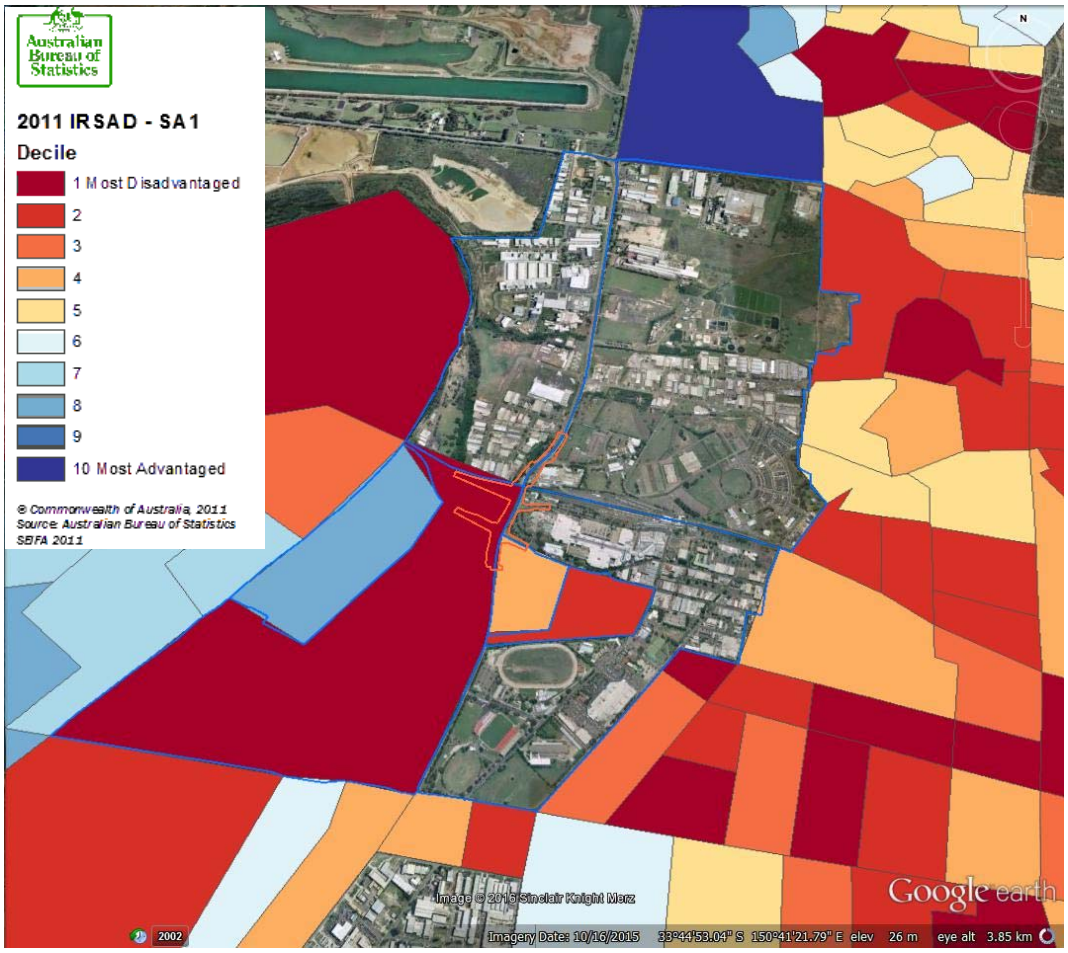


Figure 4 SEIFA IRSAD index for the study area (bounded in blue)

3.4 Need for assistance

- Seven percent of people in the study area identified a need for assistance with daily living; within the broader NSW population nine percent of people identify as such.

3.5 Travel behaviour

3.5.1 Vehicle ownership

- 177 households (26 percent) did not own a vehicle
- 296 households own a single vehicle (44 percent)
- 164 households own two or more vehicles (24 percent)
- The remaining percentage of households did not specify their vehicle ownership.

This data indicates a lower percentage of car ownership in the study area compared to the State averages. This again is likely due to the location of the study area adjacent to the Penrith CBD where higher density development is encouraged and the location of the Mountain View Aged Care facility and Retirement Village. Both these land uses are likely to house people who may not own a private vehicle.

3.5.2 Travel to work

- Around 70 percent of people in the Penrith area travel to work via car, 65 percent as the driver (Australian Bureau of Statistics, 2015)
- 11 percent of people reported travelling to work via public transport, 10 percent via train
- No one living in the study area reported cycling to work and only 41 people across the study area reporting walking to work.

3.5.3 Key transport networks

Mulgoa Road and Castlereagh Road is an important commuter, freight and bus route and provides north-south access to Penrith, Glenmore Park and Jamisontown. Mulgoa Road also provides an important link to the M4 motorway. Within the study area High Street also provides an important link to the Great Western Highway.

As reported in the proposal's Traffic and Transport Assessment (Acadis, 2015), between 1993 and 2015 traffic volumes on Castlereagh Road north of Great Western Highway have increased from 29,000 vehicles per day to 41,000 vehicles per day (average growth rate of 1.2 percent per year).

In 2015 Mulgoa Road / Castlereagh Road carried between 30,000 and 44,000 vehicles per day on a typical weekday depending on the section of road. During

weekends, traffic on Mulgoa Road / Castlereagh Road is between nine to 22 percent lower than the weekday traffic.

Greater car dependence in the outer suburbs of Sydney is well documented with the *NSW Long Term Transport Master Plan* (NSW Government, 2012) identifying that people living in Penrith travel more than three times more kilometres by car than a person living in inner Sydney. The number of car parks located in and around the Penrith CBD also demonstrate dependence on the motor vehicle.

28,000 – 38,500 non-freight vehicles use Mulgoa Road / Castlereagh Road on a daily basis. As reported in the proposal's Traffic and Transport Assessment (Acadis, 2015) during the weekday peak period travel speed on Mulgoa Road / Castlereagh Road reduces substantially below the posted speed of 60 kilometres per hour. The 2015 survey indicates that motorists travel about 10 to 35 kilometres per hour from Museum Drive to M4 Western Motorway, and about 35 to 40 kilometres per hour from Andrews Road to Museum Drive and from M4 Western Motorway to Glenmore Parkway.

From a freight perspective, heavy vehicles (including high vehicles and B-Doubles) use Mulgoa Road / Castlereagh Road and Great Western Highway / Jane Street within the study area. The low rail bridge (4.4m) restricts high vehicles from travelling along Castlereagh Road north of Jane Street.

As reported in the proposal's Traffic and Transport Assessment (Acadis, 2015), currently Mulgoa Road / Castlereagh Road from Glenmore Parkway to Andrews Road carries about 2,000 to 5,500 heavy vehicles on an average weekday depending on the section of road. This equates to seven to 15 percent of all vehicles. The number of freight vehicles using roads in the study area is expected to grow into the future.

3.5.4 Public transport

The Penrith City Centre is a strategic transport mode on the Sydney Transport network that connects the western subregion with Sydney CBD, Parramatta and Blacktown to the east and Blue Mountains to the West.

In relation to public transport, a number of bus services operate within the study area. The Penrith Transport Interchange at Belmore Street facilitates a number of bus services which operate in the proposal site, with buses accessing the interchange from Jane Street. The interchange is used by three bus operators (Busways, NightRide and the Blue Mountains Bus Company) for 26 bus routes. There are eight bus services that operate within the proposal site, including:

- Busways routes 673, 783 and 784 which operate along Mulgoa Road - Castlereagh Road and provide half hourly services in peak times
- Blue Mountains Bus Company services 688, 689, 690P, 691 and 1688 which travel from the Great Western Highway to the Interchange via High Street. These buses use the one bus stop that is located within the study area, outside the Council facility on High Street.

In addition to these daily services the N70 NightRide bus operates between midnight and 4.30am in place of trains between Town Hall station and Penrith.

Bus priority lanes are currently provided on the Great Western Highway.

Many of these services provide access to Penrith railway station which is located along Jane Street 800m from the Jane Street / Mulgoa Road intersection. Penrith Station is serviced by the T1 Western Line suburban service and the Blue Mountains Line intercity service. There are currently around 2,000 car spaces provided within the Penrith Station car park for commuter use. There is a low clearance rail bridge (4.4m) that crosses Castlereagh Road. The proposal will involve replacement of this rail bridge. Penrith rail station is located approximately 800m from the Castlereagh Road/Jane Street intersection.

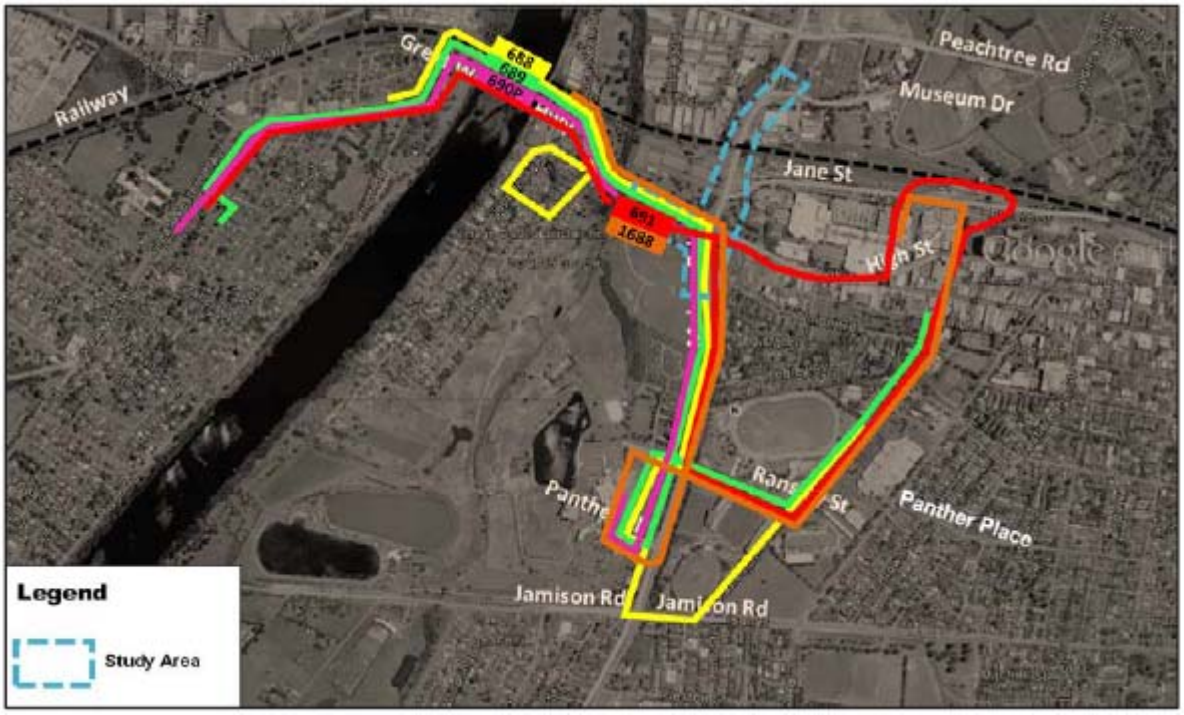


Figure 5 Public transport (bus and train) routes within the proposal area (bounded in light blue)

3.5.5 Active transport

Shared pathways and footpaths are provided within the study area to encourage walking and cycling movements. There are currently pedestrian paths on both sides of Mulgoa Road -Castlereagh Road and Jane Street and a pedestrian path running along the westbound carriageway of the Great Western Highway/ High Street (see Figure 6). The paths within the proposal site vary in width and provide access to a number of community, recreational and commercial premises.

The existing pedestrian crossings at the High Street intersection provide access across all roads except for across Great Western Highway in the north - south direction. It is possible to cross Mulgoa Road - Castlereagh Road in two stages on the north side of the High Street intersection, and three stages on the south side.

There is one zebra crossing spanning the southbound left turn lane from High Street. At the Jane Street intersection, pedestrians can cross Jane Street in three stages and Castlereagh Road in three stages from the north or two stages from the south. There is one zebra crossing spanning the eastbound right turn lane from Castlereagh Road.

Within the proposal site, there are off-road separated cycle paths along Mulgoa Road - Castlereagh Road southbound between Museum Drive and Union Road and northbound between the Great Western Highway and Museum Drive, as well as westbound on the Great Western Highway and eastbound on High Street. There is also a narrow concrete path north of the rail bridge that provides pedestrian/ cycle access from Castlereagh Road to Peachtree Road.

Figure 6 Active transport network within the proposal area

The NSW Government is planning to build a new pedestrian and cyclist bridge spanning the Nepean River between Penrith and Emu Plains as shown in Figure 7. Once constructed, this bridge will contact with dedicated cycle and walking infrastructure in the local area. This includes cycle and pedestrian infrastructure at the High Street / Mulgoa Road intersection.

Figure 7 Location of planned Nepean River Green Bridge (approximate location of proposal area shown by the red dotted boundary)

3.5.6 Key activity centres

Penrith's residents are highly car dependent. Access to the CBD is predominantly by motor vehicle, with drivers needing to find somewhere to park when they visit the area. Car parks are a dominant feature of the Penrith CBD, particularly on its fringes, highlighting this dependence. The Council Civic Centre, Westfield Penrith and Union Street car parks provide formal car park spaces in the local area. There are a number of future development sites that are currently used as temporary car parks, but these car parks will be displaced when development starts on these sites. It appears that Council staff and those visiting the Council facility, as well as Westfield shoppers, are large users of car parking in the vicinity of the study area.

Pedestrian and cycle access in the study area is encouraged, evidenced by the provision of shared pathways and sealed footpaths throughout the area. That said, crossing roads in this area is a barrier to utilising this infrastructure as crossing movements are time consuming due to the number of road sections that need to be crossed and the time for each signal sequence.

3.5.7 Incident data

As reported in the proposal's Traffic and Transport Assessment (Acadis, 2015) there were 322 crashes recorded between 2009 and 2013 on the Mulgoa Road / Castlereagh Road from Andrews Road to Glenmore Parkway. About 37 per cent of crashes involved injury and 63 per cent were non-casualty crashes. The five year crash data showed that 155 people were injured. Figure 8 shows the location and severity of these incidents.

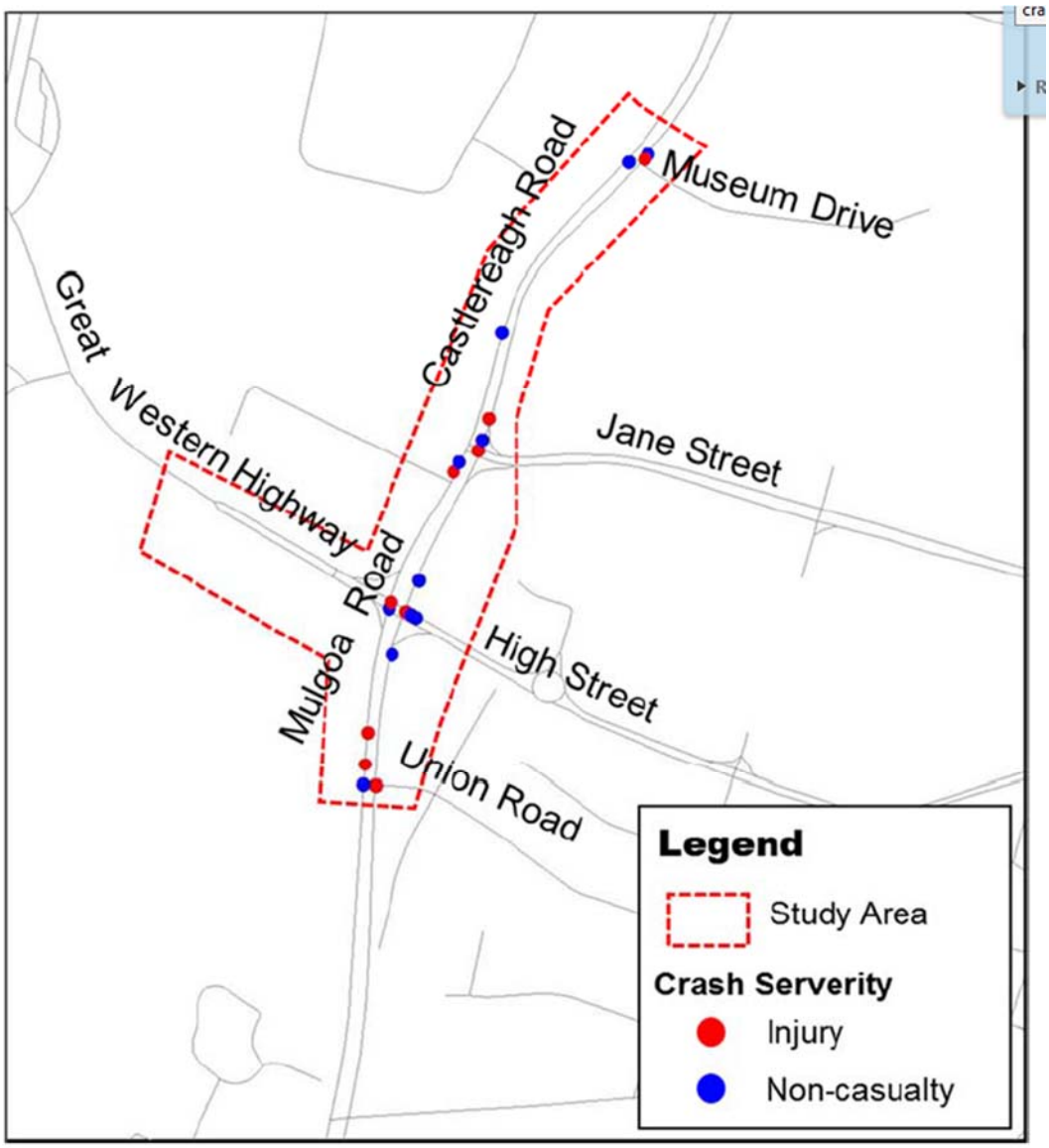


Figure 8 Crash data by location and severity (Source: Roads and Maritime, crash data recorded between January 2009 and December 2013)

3.5.8 Transport and access indicators

A number of indicators have been used to quantify the 'cost' of vehicle operation (number of stops), road use travel time and crashes.

Based on traffic modelling (Acadis, 2015), during the PM peak hour vehicles currently stop 37,325 times (2015 base case) with an average of 2.14 stops per vehicle. The cost of operating a vehicle per stop has been calculated at $0.15 per stop, equating to a cost of around $5,600 each day during this peak hour. Without any changes to the intersections, by 2036 the number of stops is expected to increase to 135,121, with an average of 7.77 stops per vehicle. This equates to a cost of around $20,300 each day during this peak hour.

Travel time costs has been valued in Vehicle Hours Travelled (VHT). It has been calculated that each VHT costs $30.44. In 2015 total trip time during the PM peak hour has been calculated at 1,183 VHT. This equates to a cost of $36,000 each day during this peak hour. Without any changes to the intersections, by 2036 the total trip time during the PM peak is expected to increase to 3,368 VHT, equating to a cost of around $102,500 each day during this peak hour. For more information about cost indicators, see the Traffic and Transport report (Acadis, 2015).

3.6 Labour force, income and employment

3.6.1 Income

- Median household income within the study area was $1,200 at the time of the 2001 census. The NSW State median was higher at $1,398.

3.6.2 Employment

- The unemployment rate across the study area at the time of the 2011 Census was seven percent
- Data published by the Department of Employment shows the unemployment rate for the Penrith LGA was 5.4 percent for the June 2015 quarter (Department of Employment, 2015). This is consistent with the Australian unemployment rate of 5.9 percent for the same time. The unemployment rate in the Penrith area has been fairly steady in the past five years, with a downwards trend occurring in recent months as shown in Figure 9.

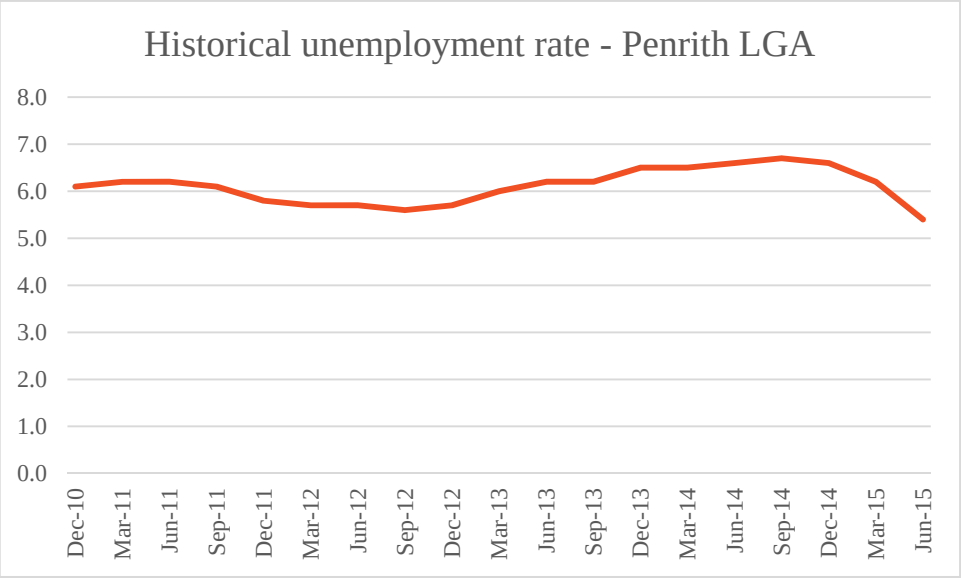


Figure 9 Historical unemployment rate Penrith Dec 2010 – June 2015

3.6.3 Industry of employment

In Penrith, people are employed by the following industries:

- Manufacturing 10,262 persons (12%)
- Retail trade 9,903 (11%)
- Health care and social assistance 8,867 (10%)
- Construction 8,165 (9%)
- Public administration and safety 6,471 (7%)
- Transport, postal and warehousing 6,420 (7%)
- Education and training 5,801 (7%)
- Accommodation and food services 4,832 (6%)
- Wholesale trade 4,772 (5%)
- Financial and insurance services 3,806 (4%).

3.7 Business and industry

3.7.1 Industry indicators

In 2014 Penrith's Gross Regional Product (GRP) was estimated at $7.61 billion, 1.6 percent of the State of NSW's Gross State Product (economy.id, 2015).

Key industries adding value to the GRP include:

- Manufacturing - $870m (13.4 percent)
- Health care and social assistance – $667m (10.3 percent)
- Public Administration and Safety - $617m (9.5 percent)
- Education and Training - $615m (9.5 percent)
- Construction – $600m (9.2 percent)
- Retail Trade – $518m (8 percent)
- Transport, Postal and Warehousing - $383m (5.9 percent)
- Wholesale trade - $320m (4.9 percent)
- Financial and insurance services - $281m (4.3 percent)
- Electricity, gas, water and waste services - $263m (4 percent).

3.7.2 Local business

In 2014 there were 12,424 registered businesses in Penrith. Construction; rental, hiring and real estate services; transport, portal and warehousing and professional, scientific and technical services were the industries with the largest number of registered businesses as shown in Figure 10.

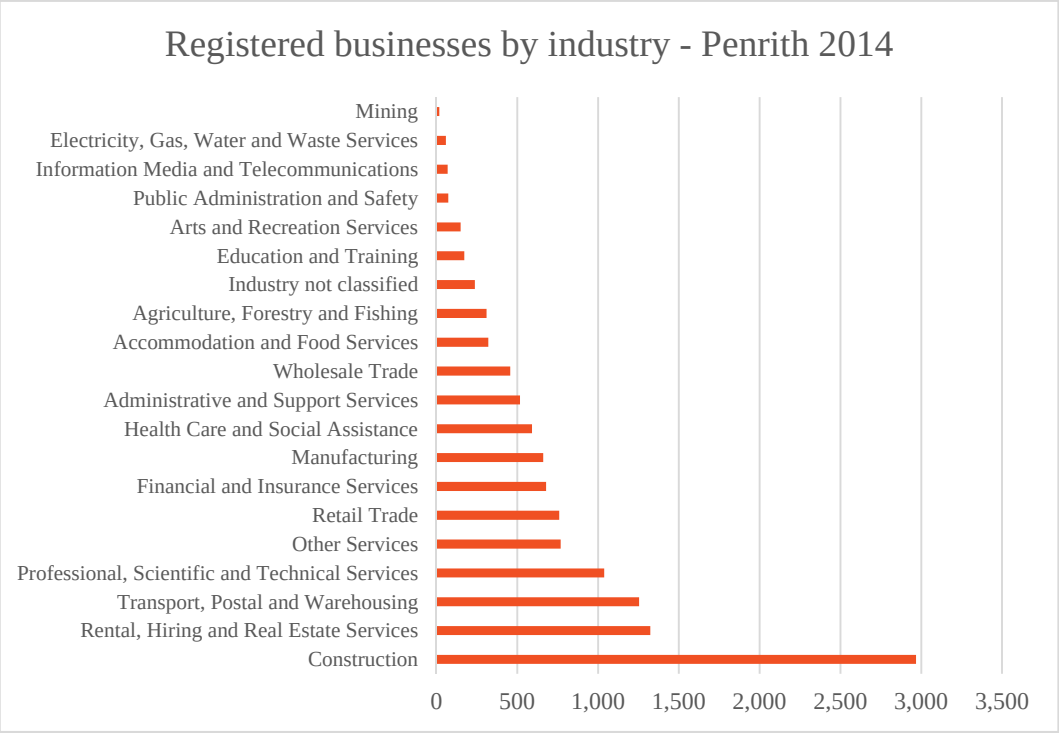


Figure 10 Registered businesses by industry – Penrith 2014

The following provides an overview of relevant local businesses/business related activities in the SEIA study area.

- **Penrith CBD** – The Penrith CBD is located to the east of the study area. This is one of the main activity centres in the Penrith LGA and is the focus for business related activities in the local area
- **Great Western Highway businesses** – There are a number of businesses located in former residential dwellings within the proposal area. A number of these properties are currently used by businesses or community organisations for their operations. This includes Chatterbox Speech pathology, Nepean Area Disabilities Organisation (NADO) and Tri Community Exchange
- **Sinclair Motors site** – Located on the corner of High Street (652 High Street) and Mulgoa Road, the Sinclair Motors site is an operational car yard and service centre with a large portion of the site used for car parking. This car parking is signed as the Council's temporary car park. Council has discussed development of this site with its owners, but as yet, a Development Application has not been lodged by the developer. It is expected that this development will be a mixture of residential and commercial development
- **Lion Dairy and Drinks** – Located at 2257 Castlereagh Road, Lion Dairy and Drinks is a milk processing and manufacturing facility. Operating 24/7, the dairy is serviced by approximately 30 milk tankers and 40 distribution vehicles daily with additional truck deliveries (i.e. for plastics and other materials) occurring as required
- **Westfield Penrith**– Located adjacent to the Council facility, Westfield Penrith, also known as Penrith Plaza, is a shopping complex located at 585 High Street. The centre has more than 300 retailers, 3,500 car park spaces and

is located adjacent to Penrith train station. Westfield representatives reported that peak trading occurs in the weeks leading up to Christmas and Mothers' Day, as well as school holiday periods. During peak trading Westfield often asks Roads and Maritime to change phasing on the traffic signals at High Street and Worth Street to enable drivers to exit the car park. Anecdotal evidence indicates that drivers exiting the shopping centre also use Worth Street and Union Road as a 'rat run' to access Mulgoa Road and avoid the study area.

Westfield has reported that reaching their maximum in relation to car parking happens infrequently (usually only in the Christmas period) and they do not recommend anywhere for overflow car parking. That said, Penrith City Council lists a number of overflow car park sites on their website and variable message sign about overflow car parking was observed in the area in late November

- **Penrith Panthers Entertainment, Leisure and Sporting Precinct** – Located approximately 600m from the study area at 123 Mulgoa Road, the precinct includes a range of dining, bar, event and activity facilities. The 22,500 seat Penrith Panthers stadium is located across Mulgoa Road. Planning is underway to replace the stadium and further develop the entertainment, leisure and sporting precinct.

3.7.3 Agriculture

In 2010/11, Penrith's agricultural industry added $83 million to the local economy. Key industries contributing to this total were livestock slaughtering, egg production, vegetable production and nurseries and cut flower producers (econmy.id, 2015).

Agriculture, forestry and fishing accounted for 560 jobs in the Penrith LGA at the time of the 2011 Census (Australian Bureau of Statistics, 2015).

In the proposal site is the Lion Dairy factory. The Lion Dairy factory produce, market and distribute milk beverages, cheese, yoghurt, juice and soy. Milk is sourced from 160 farmers from the central west to the southern downs.

3.7.4 Tourism

In 2013/14, Penrith's tourism and hospitality industry generated 3,638 full time equivalent jobs and added $347.1 million to the local economy.

Key tourism attractors in Penrith include

- Arms of Australia Inn
- Flip Out
- Horizon Line – Kayak and Stand Up Paddleboard hire
- iFLY Indoor Skydiving
- International Regatta Centre
- Jetpack Adventures
- Muru Mittigar Aboriginal Cultural Centre
- Museum of Fire
- Museum of Printing

- Nepean Belle Paddlewheeler Cruises
- Nepean Naval Museum
- Nepean River Tours
- Penrith Heritage Drive
- Penrith Regional Gallery & Lewers Bequest
- Penrith Whitewater Stadium
- Skypeak Adventures
- The Joan – Performing Arts Centre
- The Rock Lookout
- Unreal Mini Golf
- Woodriff Gardens.

Woodriff Gardens is located within the proposal area, while the Museum of Fire and The Joan are located adjacent to the proposal area.

3.8 Community values

Penrith City Council's Community Plan (2015) outlines the following vision for the community:

> *A sustainable and prosperous Regional City with a harmony of urban and rural qualities.*

Key priorities outlined in the plan include generating more local jobs and making sure Penrith has the infrastructure and services it needs into the future. To achieve this, Council's focus for the coming years is to:

- Focus on investment and growth in the City's key centres, Penrith Health and Education Precinct and Western Sydney Employment Area
- Creating opportunities for activities on and around the Nepean River
- Advocating for a stadium that is capable of hosting national and international events (entertainment and sport)
- Working with Government to secure the Penrith Lakes Parklands and participate in unlocking future development potential.

Community engagement undertaken to develop the Community Plan highlighted seven key outcomes that that community wants to achieve:

- We can work close to home
- We plan for our future growth
- We can get around the city
- We have safe, vibrant places
- We care for our environment
- We have confidence in our Council
- We are healthy and share strong community spirit.

3.9 Social infrastructure

The following provides an overview of the social infrastructure and values in the study area and its surrounds.

3.9.1 Open space and recreation

- **Woodriff Gardens** – Owned by Council, Woodriff Gardens is designated SP3 (tourist) in the *Local Environment Plan 2010* and forms part of the Council's Riverlink Precinct. As outlined in section 6.3 of the REF, Woodriff Gardens was established in the early 1970s by Council as part of the Woodriff Gardens Tennis Centre. The Gardens is a public park that acts as the entrance to the city. It has not changed significantly since its inception. See Figure 11 and Figure 12 for photographs of the garden.

Figure 11 Woodriff Gardens looking north from Great Western Highway

Figure 12 Woodriff Gardens looking south-east from the car park area

While the gardens are not listed in any heritage registers, it hosts the formal 'entrance statement' for Penrith (see Figure 13) and is an example of civic facility planning and character from the late twentieth century. Woodriff Gardens is considered by Council as the gateway to the Penrith CBD. The open, green space that it provides is valued by Council and the community and is seen to provide a visual link to the Nepean River.

Figure 13 Planted Penrith entry statement

The gardens are separated from the Penrith CBD by the Mulgoa Road/ Castlereagh Road and High Street/Great Western Highway intersection which creates a barrier to accessing the gardens from the city centre. The gardens can be accessed by foot by crossing Mulgoa Road/Castlereagh Road from the northern side of High Street (near the Penrith Civic Centre). By vehicle, the car park for the gardens can be accessed by left turn only from Mulgoa Road/Castlereagh Road. This access and car park also services the adjacent tennis facility. Anecdotally, it has been reported by Council that the gardens are not heavily utilised for recreational purposes.

- **Nepean District Tennis Association** – Located between Woodriff Gardens and the western rail line, the Nepean District Tennis Association is accessed via Castlereagh Street. With 14 courts, the association has 9,500 registered players and has around 1,500 interactions with members and others each week via matches, coaching and court hire. Peak activity occurs 4pm – 8pm on weekdays and Saturday mornings. 10-12 Tennis Australia sanctioned tournaments are held each year ranging from single day events with 100-150 players to multi-day events with 500-600 players. Council has recently renewed the association's lease arrangements for a five year term till 2020. Penrith City Council is currently in the process of resurfacing 10 of the 14 courts at this site, indicating the facility's value to the community. The Nepean District Tennis Association has indicated that there are current issues with access and egress at the site, especially during peak times.
- **Nepean River** – Located approximately 600m from the study area, the Nepean River is an important waterway for the people of Penrith and Sydney. It supplies water to Sydney and its agricultural areas. It provides amenity, cultural, sporting (i.e. rowing) and environmental benefits for the community.

In the vicinity of the proposal site the Nepean River is crossed by the Victoria Bridge which provides access for Great Northern Highway.

3.9.2 Community facilities

- **Penrith Ambulance Station** – Listed as a heritage item (item 256) in the Penrith *Local Environment Plan 2010*, Penrith Ambulance Station, located at 672 High Street, is operated by Ambulance NSW. It services the Western Sydney and Nepean Blue Mountains region. Health Infrastructure NSW has recently submitted a Development Application to Penrith City Council to relocate the ambulance station to 141 – 153 High Street Penrith. Ambulance NSW representatives estimate that this move will take place around 2017, depending on funding announcements for the new Paramedic Emergency facility.

  The ambulance station currently has a bespoke signalling arrangement on High Street provided by Roads and Maritime that allows ambulance drivers to stop traffic in various directions to enable safer right hand turns out of the station. Ambulance NSW has indicated that this signalling arrangement is only activated on the highest priority calls. A restructure to Ambulance NSW's call priority system means that there are fewer calls requiring the highest priority response, therefore the signalling arrangement is not used frequently. That said, it is vital that this remains in place at all times for the occasions it is required.

- **Penrith City Council** – Council's operational office, the Penrith Civic Centre and the Penrith Library are located on the corner of High Street (601 High Street) and Mulgoa Road. These buildings are surrounded by car parking used for Council related activities. The car park is boarded by large trees which provides a screen between the facility and Mulgoa/Castlereagh Road.

  This site is included as part of the community, cultural and civic precinct in Council's Invitation to Partner documentation which is aimed at attracting investment/development interest for Penrith.

- **Joan Sutherland Performing Arts Centre** – Located at 597 High Street between Council's facility and Westfield Penrith, the performing arts centre is Penrith's premier cultural facility. The arts centre does not have its own car parking, instead it encourages people to park in Council's car park (after 3:30pm), in Westfield's car park or in the Union Road car park.

- **Museum of Fire** – Located Museum Drive, the community museum focuses on displaying firefighting memorabilia and educating people about fire safety. The Museum of Fire has an iconic sign located on the corner of Museum Drive and Castlereagh Road (outside Lion Diary), that incorporates a fire truck (see Figure 14).

  The museum also hosts a number of exhibitions each year including the Doll and Bear Show (October), Penrith Working Truck Show (attended by approximately 20,000 people in March each year) and Sydney Classic and Antique Truck Show.

Figure 14 Museum of Fire sign on the corner of Museum Drive and Castlereagh Road

- **Penrith Showgrounds** – Located approximately 600m from the study area, the Penrith Showgrounds are used for a range of activities annually. The Penrith Show is held in late August each year. Markets are held on the site each Wednesday. The Penrith Paceway is also located on the showgrounds site, with racing taking place on Thursday nights.

3.9.3 Other

- **Residential dwellings on High Street** – There are a number of residential dwellings located on High Street. Council has acquired most of these dwellings as part of planning for the Riverlink Precinct. Some properties remain in private ownership. A number of these properties are currently used by businesses or community organisations for their operations.
- **Mountain View Aged Care and Retirement Village** –The aged care facility and retirement village is located on Mulgoa Road. Given its proximity to the Penrith CBD, residents of Mountain View Retirement village may be using the footpaths located on Mulgoa Road to access the Penrith CBD on foot or via mobility scooter.
- **Car parking** – There is a range of formal and informal parking in the Penrith CBD highlighting the importance of the car in this area. Some of this parking is located within the proposal site.
- **Riverlink Precinct** – Designated as a key precinct in Council's *Development Control Plan 2014*, the Riverlink Precinct aims to link the Penrith CBD to the Nepean River via a living, entertainment and working precinct. It has been designated SP3 (tourist) in the *Local Environment Plan 2010*. To date the precinct exists via planning control with Council acquiring selected properties within the precinct when they become available to buy. The precinct also includes a large parcel of vacant land that is known locally as the 'Carpenters site'.

Proposal area

Figure 15 Social features located in close proximity to the study area

Figure 15 shows the location of those features located in close proximity to the study area.

Proposal area

Figure 15 Social features located in close proximity to the study area

Figure 15 Social features located in close proximity to the study area

4 Stakeholder and community engagement

Roads and Maritime has conducted a range of stakeholder and community engagement activities for the proposal. In 2013 the Australian and NSW Governments announced the Jane Street Extension project to address expected growth in the Penrith area and to alleviate congestion near to the Penrith CBD. As part of the announcement, the Australian and NSW Governments each committed $35 million ($70 million in total) to fund the proposal.

Initial stakeholder consultation, design and traffic modelling identified a number of options to reduce congestion within the proposal site. The preferred option was selected and made available for public comment from November 2014 – February 2015. 23 submissions were received from stakeholders and the community during this public comment period. The issues discussed in these submissions have been taken into consideration in this socio-economic assessment.

To prepare this socio-economic assessment, meetings were held with Penrith City Council, Ambulance NSW, Lion Dairy, Westfield and the Nepean District Tennis Association. At these meetings a draft concept design was shown and feedback on potential impacts was gathered so this could be fed into the REF and ongoing design process. The following presents a summary of the key issues and opportunities highlighted by each organisation:

4.1 Penrith City Council

- Retention of green space and a ‘green’ linkage from the CBD down to the Nepean River is important to Council
- Maintaining access and reprovision of ingress/egress to Council car park (off High Street) is important to Council
- Property impacts will be addressed by Council’s property team
- Request to re-provide the indented bus bay on High Street outside Council
- Council is keen to provide shared path linkages to tie in with the new Nepean Green Bridge. Keen to discuss with RMS opportunities to provide improved active transport facilities
- Pedestrian crossing times are long and need to be improved if possible
- RMS is looking to Council for guidance on urban design outcomes
- Impacts to Woodriff Gardens should be minimised as much as possible and the Penrith entry statement is to be re-provided
- Entry and exit from the tennis courts is already difficult, Council would support actions to improve this access.

4.2 Ambulance NSW

- New Paramedic Response Facility will be built further along High Street in the coming years (outside the proposal site) which will relocate the emergency response function from Penrith Ambulance Station

- The ambulance station currently has a traffic light override system provided by RMS to enable safe emergency egress from the station. This facility is to remain operational at all times until the emergency response function moves from Penrith Ambulance Station.

4.2.1 Lion Dairy

- Need to maintain 24/7 property access for vehicles as large as B-Double trucks
- Management is happy to investigate a detour route for visiting vehicles to assist with access and egress during construction.

4.3 Westfield Penrith

- Avoiding disruptive construction activities during the Christmas trading peak (December) would be appreciated
- Westfield already works with RMS during peak trading to amend traffic light phasing to assist with egress from the centre. This may also need to be considered in the construction traffic management plan.

4.4 Nepean District Tennis Association

- Tennis courts are currently being resurfaced and lease with Council has recently been resigned
- Access and egress from the facility is already difficult, especially at peak times (afternoon/evenings and Saturday morning).

4.5 Deerubbin Local Aboriginal Land Council (LALC)

The Deerubbin Local Aboriginal Land Council (LALC) was engaged to assist with an Aboriginal cultural heritage survey undertaken on 5 November 2015. The Deerubbin LALC provided a summary of the site investigation which is included in section 5.3 and Appendix F of the REF. Aboriginal stakeholders will be further engaged as outlined in Roads and Maritime's *Procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI).

5 Assessment of social and economic impacts

The proposal includes an upgrade of road infrastructure along Mulgoa and Castlereagh Roads between Museum Drive and Union Road including sections of High Street and Jane Street. This includes upgrading two major intersections (High Street/Mulgoa Road and Jane Street/Mulgoa road) to improve traffic flow from Jane Street to the Great Western Highway (High Street), in the vicinity of the Penrith Central Business District (CBD) and also respond to future growth in traffic due to large residential developments in the Penrith Local Government Area (LGA).

The proposal would be constructed using a staged methodology that recognises the importance of maintaining traffic flows, access to the Penrith CBD and other locations and the need for coordination with the proposed railway bridge replacement over Castlereagh Road. See section 3.3.1 of the REF for more information about the construction methodology.

Construction is expected to commence in 2018 and be completed by mid-2020. The key challenges for construction of the proposal include:

- The requirement for work in close proximity to high volumes of traffic
- The need to minimise impact on road traffic flows and the desire to maintain existing design speeds during construction
- Complexity around traffic movements and the need for various temporary traffic lane configurations during various construction activities
- The complexity introduced by the need to lower the existing pavement beneath the existing bridge.

The following potential socio-economic impacts related to the proposal have been identified for the proposal site and its surrounds.

5.1 Construction phase impacts

5.1.1 Property impacts

The proposal would require Roads and Maritime to acquire land to construct the road infrastructure upgrade. These acquisitions would all be partial takes except for a full acquisition of a piece of land that is currently part of the road reserve. The partial land acquisitions will be strip acquisitions along property boundaries to allow for the expansion of the road footprint.

None of the properties required are currently used for residential purposes. These properties are currently owned Council, Endeavour Energy, Sydney Trains and a private developer as shown in Table 1. Current land uses range from road reserve, open space, recreation, utility provision, Council's civic centre, future planned development and overflow car parking. None of the current land uses would be removed from these land parcels due to land acquisition requirements.

Table 1 Property acquisition

Current land use	DP	Lot	Property owner	Full/ partial	Area (m^2)
Woodriff Gardens	DP1051278	5	Penrith City Council	Partial	2235
Nepean District Tennis Association	DP1051278	4	Penrith City Council	Partial	778
Parkland	DP739989	903	Penrith City Council	Partial	2231
Parkland with retention pond	DP866979	1	Penrith City Council	Partial	1958
Electrical substation	DP1017480	5	Endeavour Energy	Partial	2535
Car park	DP218028	1	Penrith City Council	Partial	756
Penrith City Council chambers	DP1102232	1033	Penrith City Council	Partial	1883
Car park	DP717196	12	Macbro Properties Pty Limited	Partial	150
Car park	DP717196	13	Macbro Properties Pty Limited	Partial	158
Parkland	DP717196	18	Roads and Maritime	Full	749
Agriculture	DP717196	10	Penrith City Council	Partial	6488
Parkland	DP808860	1	Penrith City Council	Partial	1119
Private residence	DP37702	6	Private	Partial	31
Car park	DP731213	32/36	TBC by Roads and Maritime	Partial	289

Acquisition of land would take place prior to the start of construction. Roads and Maritime would undertake all acquisitions in accordance with current Roads and Maritime guidelines including *Roads and Maritime Services Land Acquisition Information Guide* (Roads and Maritime Services, 2014b) and the *Land Acquisition (Just Terms Compensation) Act 1991*.

The proposal is not expected to have a direct impact on the demographic profile of the study area or its surrounds as the proposal footprint does not impact any existing residential properties and does not require any changes to where people live.

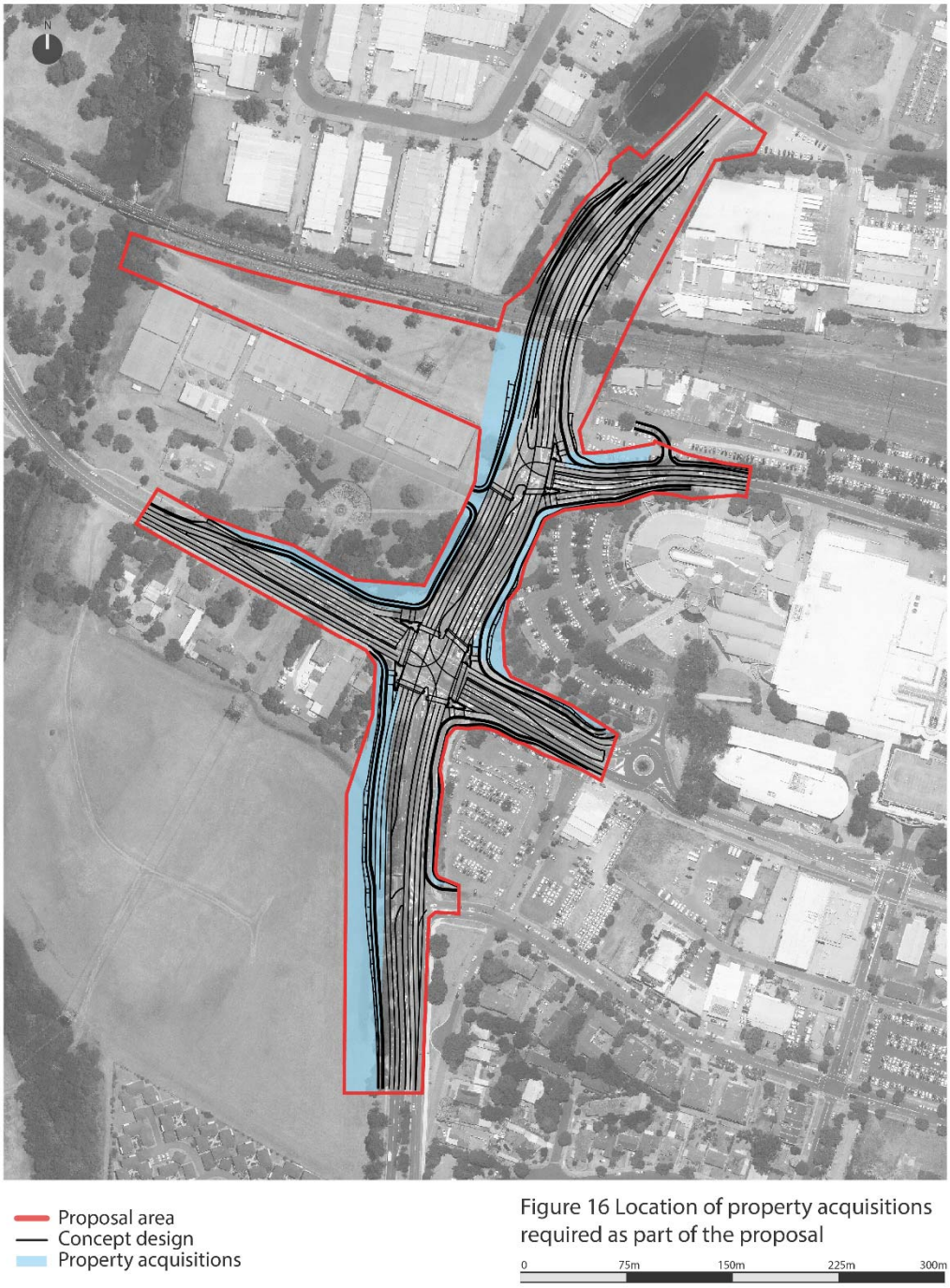


Figure 16- Map showing location of property acquisitions

A main construction compound comprising a temporary equipment laydown and stockpile site is proposed to be established adjacent to the Nepean District Tennis Association on land owned by Penrith City Council. A lease agreement would be negotiated with Council for the use of this land. This is proposed as the main construction compound and would be of sufficient size to accommodate:

- Stockpiles and material laydown areas
- On-site construction buildings and worker facilities

- Temporary car parking.

A secondary area required for additional material stockpiling and material rehandling is proposed at land known as the 'Carpenter site' owned by Penrith City Council, located south west of High Street and Mulgoa Road. A lease agreement would be negotiated with Council for the use of this land.

A further material handling area is proposed at the southern end of the proposal, on the western side, with access off Mulgoa Road. This area may be used for stockpiling pavement excavation material from the road works.

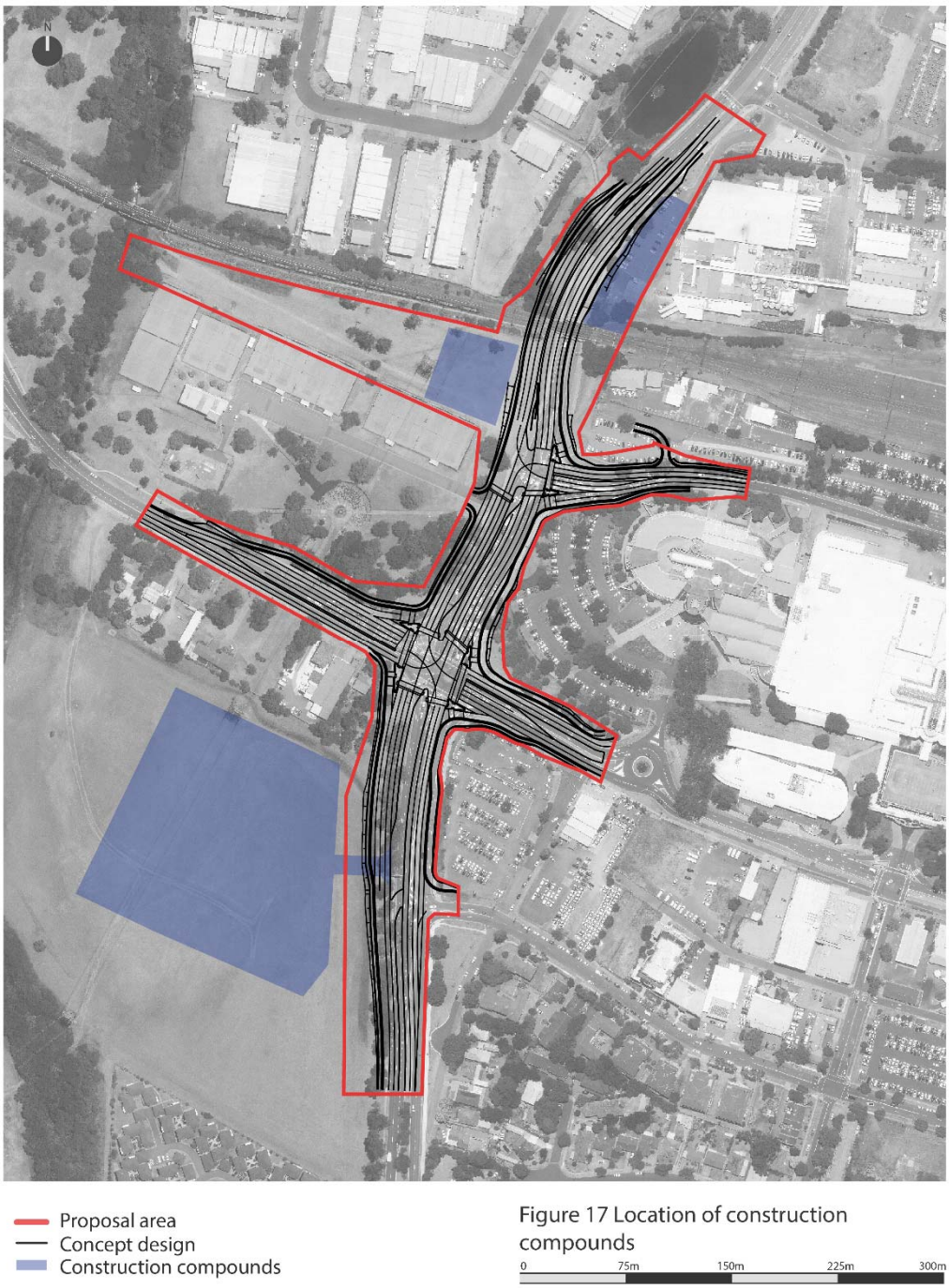


Figure 17 - Map showing location of construction compounds

Relocation of utilities will be negotiated with the relevant authorities and undertaken in accordance with their relevant procedures to minimise disruption of service.

5.1.2 Amenity impacts

Amenity is related to the features of an area that increase its attractiveness or value in relation to the people who live, work or otherwise utilise the location. Amenity is described using a combination of factors such as visual, noise, air quality, functional and other aspects related to people's enjoyment of the area.

Construction activities related to the proposal are expected to have some impact on amenity in and directly adjacent to the proposal site. This is likely to include:

- Noise and vibration impacts
- Air quality impacts
- Visual amenity impacts.

5.1.2.1 Noise and vibration

There are a number of construction activities where construction noise impacts are expected. These activities include:

- Bridge works at night
- Any daytime, evening or night works in the vicinity (within ~70 m) of residential premises along High Street to the West of the intersection with Mulgoa Road
- Any daytime works in the vicinity (within ~100 m) of the Jane Sutherland Performing Arts Centre.

Where possible, work would be limited to the recommended standard hours for construction work outlined in the Interim Construction Noise Guideline (DECC, 2009) (ICNG) which are:

- 7.00am – 6.00pm Monday to Friday
- 8.00am – 1.00 pm Saturdays
- No work on Sundays or public holidays.

To minimise disruption to traffic and to reduce the duration of construction, some work would need to be undertaken outside of these hours. This includes the relocation of services under the road, some pavement works through intersections and construction of the railway bridge.

For work required outside standard hours, reasonable and feasible work practices to minimise noise nuisance (nominally set at 5dBA above background noise levels) would be planned and implemented through a noise management plan. This would include notifying potentially affected residents and businesses. Other noise generating works outside standard construction hours would require justification in accordance with the ICNG and formal written consent by Roads

and Maritime to modify the working hours set in the REF. For further detail about construction noise management refer to Section 6.5 of the REF.

It is recognised that works undertaken at night near residential areas have the potential to cause sleep disturbance. As such nightworks will be minimised and only undertaken when unavoidable, therefore it is not expected that noise impacts from construction works would affect the health or wellbeing of residents. Where predicted noise levels exceed relevant noise limits, feasible and reasonable mitigation measures would be considered.

In relation to vibration, the main sources of construction vibration include:

- Excavation
- Grading of existing roadways
- Vibratory compacting of new road surfaces.

Section 6.5.4 of the REF outlines safe working distances in relation to vibration creating construction activities. Mitigation would be considered where sensitive receivers are located closer to the construction work than these 'safe working distances'. Construction noise mitigation and management measures have been developed for the proposal and are provided in Section 6.5.5 of the REF.

The construction contractor would refine construction methods to minimise the construction noise and vibration impact upon the sensitive receivers adjacent to the proposal site, and would be required to prepare a detailed construction noise and vibration management plan.

5.1.2.2 Air quality

Construction activities have the potential to generate dust which could impact air quality. There is the potential for dust generation associated with the following construction activities:

- Stripping of topsoil
- Clearing of vegetation
- Earthworks
- Stockpiling
- Transport and handling of soils and materials
- Traffic movements on unpaved roads.

Dust generation would occur temporarily and be exacerbated by dry and windy conditions, particularly on hot days. Potential impacts would be minimised through the implementation measures such as water spraying or covering exposed surfaces, provision of vehicle clean down areas, covering of loads, street cleaning, use of dust screens and maintenance of plant in accordance with manufacturer's instructions.

Exhaust emissions from plant, machinery and vehicles used during the construction phase would also have the potential for emissions that could impact on air quality and amenity for local residents. It is expected that all construction

vehicles, plant and machinery would be operated in accordance with the manufacturer guidelines and therefore associated emissions and air quality impacts would be negligible in the context of existing vehicular movements in the area.

Section 6.12.3 of the REF outlines safeguards and management measures to address potential air quality impacts. This includes the preparation of an Air Quality Management Plan.

5.1.2.3 Visual amenity

Expansion of the road footprint continues the incremental expansion of the road corridor within the proposal site. Vegetation along the edges of the roadway within the proposal site would be cleared for construction related activities and new structures (such as the new rail bridge and retaining wall) would be new elements in the visual landscape. Vegetation clearance is especially relevant to Woodriff Gardens where vegetation removal will be most obvious. This would include the removal of the current planted Penrith entry statement. RMS would work with Council to design a replacement entry statement that would be installed during the construction phase.

The removal of vegetation within the proposal site to make way for the expanded road corridor may cause concern for some people in relation to community values associated with green space and environmental protection.

Section 6.6.2 of the REF outlines safeguards and management measures to address potential visual amenity impacts.

5.1.3 Travel behaviour

Construction of the proposal would generate light vehicle, truck and heavy equipment movements to and from the proposal area. Typical traffic generating activities would include construction staff travelling to and from site, delivery of plant, equipment and construction materials, and collection and disposal of waste not appropriate for reuse on-site. Heavy machinery would need to be transported to and from site during off peak hours to minimise road user delays due to turning movements.

Individual lane or full road closure on Mulgoa Road, Castlereagh Road, Jane Street, High Street and the Great Western Highway may be required at times to undertake construction work. Temporary lane closure would affect the flow of traffic accessing the Jane Street / Mulgoa Road – Castlereagh Road and Great Western Highway / Mulgoa Road / High Street intersections, however this would be short-term and would be undertaken during off-peak hours where possible to minimise impacts. The construction of the new rail underpass requires a number of rail possessions which mostly will have little or no impact to traffic movements. However, the demolition/erection works of the bridge structure will require a two to five day rail possession and an associated full closure of Castlereagh Road (with implementation of appropriate traffic diversions). Full road closures would impact the wider local road network due to traffic diversions.

However this would be temporary and considered to be manageable when undertaken outside of peak periods. See section 6.1.2 for more information about traffic and road network impacts.

In order to minimise possession time of the railway bridge and infrastructure and in order to keep as many lanes open as practical, it is proposed that construction would be undertaken in the following sequence:

- Early works associated with setting up diversions and relocating utility and service corridors
- Preparation for the bridge works including establishment of the working platforms
- First phase of track possessions for provision and preparation of sliding beams
- Offline bridge construction
- Second phase of track possession including demolition of existing structures, protection of optic fibre cables, construction of new bridge and reconnection of rail
- First phase of road works outside of the existing road alignment on the western side of Castlereagh Road
- Second phase of road works outside of the existing road alignment on the eastern side of Castlereagh Road
- Finalisation of road works on the western side of Castlereagh Road including provision of temporary lanes overlying the existing footpath
- Finalisation of road works on the eastern side of Castlereagh Road
- Completion of remaining road works around Jane Street, High Street and Great Western Highway.

Expected traffic impacts would be managed in accordance with a project specific traffic management plan (TMP) and relevant road occupancy approvals.

Given these expected impacts, the proposal will likely impact peoples travel behaviour during the construction phase. Construction is expected to commence in 2018 and be completed by mid-2020. During this time traffic control will be in place to reduce speeds, control stoppages and provide detours. There will be times where complete shut downs of sections of road will take place, such as replacement of the rail bridge as discussed above. Detour routes would need to be provided for road traffic and rail replacement buses for rail patrons (during rail possessions). This disruption may impact commuters, local residents, businesses, heavy vehicle operators, public transport users and active transport users for the duration of construction.

5.1.4 Public transport

As described in section 3.5.4, bus and rail infrastructure are both located within the proposal site. The proposal requires replacement of the existing rail underbridge to allow three lanes of traffic in each direction on Castlereagh Road and a left turn lane into Jane Street. The new bridge will be constructed

immediately to the south of the existing bridge, and slid into position during a rail/road possession.

Impacts to railway operations due to construction will be limited as bridge works will be timed to coincide with a Sydney Trains shut down. It is expected that three rail possessions will be required to complete this work. The third and final possession will coincide with a planned shutdown, but will be an extended five day possession to complete the bridge replacement. Bus services will be provided in place of train services during these times by Sydney Trains as per their normal practice.

Impacts on the Sydney Trains parking and access points would be kept to a minimum. It is proposed that the existing connectivity and parking provisions be maintained at the Castlereagh Road / Jane Street access points. Temporary closures of select accesses may be required and would be completed outside peak commute times.

Access to the Sydney Trains maintenance yard located off Castlereagh Road will also be impacted by construction works. Access to this site will be gained off Jane Street via the existing Penrith Station car park entrance. Close engagement with Sydney trains is ongoing to plan activities that impact their infrastructure.

While located outside the proposal site, access to Penrith Train station (off Jane Street) may be impacted during construction works due to changes to road and footpath conditions, construction related traffic and changes to car parking arrangements within the proposal site.

Bus services operating on roads within the proposal site may also experience delays during due to construction activities. The existing indented bus stop located within the proposal site on High Street will be relocated during construction. A temporary bust stop would be used during this time to maintain services.

In relation to active transport, shared paths and footpaths within the proposal site would be impacted by construction activities. Traffic management planning would also take pedestrian and cycle movements into consideration to maintain access via these modes in and around the proposal site.

Any changes to public transport would be discussed with operators so changes can be communicated to patrons prior to changes taking place.

5.1.5 Active transport

Connections for pedestrians and cyclists would be maintained throughout the construction period. Where active transport connections are temporarily removed or blocked an alternative connection would be provided. These connections would be as direct as possible. In general there is sufficient space within the existing road verges and adjacent to the proposed works to accommodate existing or temporary pedestrian and cycle facilities.

5.1.6 Car parking

As described in section 3.9.3 there is a range of formal and informal parking in the Penrith CBD. Construction activities are not expected to impact any formal car parking arrangements in and around the proposal site. Potential use of the area between the tennis courts and the railway for a temporary construction compound would impact the informal car parking that occurs on this location. The small number of people who currently park their cars in this area would need to find an alternate car park during construction activities.

It is recognised that the construction workforce will require car parking. This is to be considered when planning the construction compound to avoid adding any additional demand for car parking to the local area. Construction staff parking is to be provided within the construction compound.

5.1.7 Social infrastructure

As outlined in section 0, items of social infrastructure are located within and directly adjacent to the proposal area. This section outlines potential impacts associated with these.

5.1.7.1 Open space and recreation

The edges of Woodriff Gardens that run alongside Mulgoa Road/Castlereagh Road and High Street will be acquired to allow for the expansion of the road footprint (see Figure 16). This will remove 2,838 m^2 of open space from Woodriff Gardens. This will also impact the existing planted Penrith entry statement and will require removal of some trees from the perimeter of the garden. The majority of the existing mature vegetation within the gardens will be retained. The overall function of Woodriff Gardens as passive recreation and open space is not expected to be impacted, but it is noted that the open space area will be reduced in size. See section 6.6 of the REF for details about landscape and visual impacts.

The Nepean District Tennis Association is located adjacent to Woodriff Gardens. A 1,675m^2 portion of land that runs alongside Mulgoa Road/Castlereagh Road will be acquired to allow for the expansion of the road footprint. This land is owned by Penrith City Council and is a grassed / gravel covered roadside area that is used as an informal parking area (see Figure 17). This will not affect the tennis courts which are set back from the road.

The existing left in and left out access at Mulgoa Road to the Nepean District Tennis Association would remain open during construction, providing entry and exit points to both the tennis facilities and the site compound during construction. Appropriate traffic management planning would be undertaken in consultation with the tennis association to coordinate major works to avoid major tennis events where possible.

5.1.7.2 Community facilities

Penrith Ambulance station is currently located directly adjacent to the proposal site. The operational ambulance station will move to a new location further along High Street outside the proposal site by 2019, but timing for this move has not yet been confirmed. Access requirements during construction would need to be reviewed if the ambulance station is still in service at current location during this time. As noted in section 3.9.2, unimpeded egress from the ambulance station must be maintained while it remains operational in this location to enable emergency response activities. The proposed design includes pavement widening works across the existing property access point, which would need to be coordinated with the Ambulance Station. Temporary access provisions may be necessary to maintain access at all times. Construction activities would impact the road layout and facilities and as such have the potential to impact emergency response times. Traffic management planning must incorporate planning for emergency egress and allowing ambulances to quickly move through the construction area.

Access to the construction site and the construction compound would be via the Nepean District Tennis Association entrance from Mulgoa Road. This access also services Woodriff Gardens. During construction, it is expected that approximately 200 light vehicle and 200 heavy vehicle movements would occur each day during the peak construction period (during a typical working day). Parking for construction staff would be provided at the construction compound site. However some construction personnel may need to utilise on-street parking in the vicinity of the site during works. Any expected traffic impacts have been assessed and would be managed in accordance with a proposal specific traffic management plan (TMP) and any road occupancy approvals.

A portion of land alongside the Penrith Civic Centre will be acquired to allow for the expansion of the road footprint. This will result in the removal of vegetation from the edges of the parking area but is not expected to impact car parking areas. Access to the Penrith City Council would be maintained throughout the construction period. Some works may require partial closure of the Mulgoa Road / High Street intersection limiting access to the Council car park from High Street, however it is recommended that these works be completed as night works. To maintain full access during this time, a temporary detour connection would be sign posted along Union Street, Worth Street and High Street for the duration of the proposed road closure.

Patrons of the Joan Sutherland Performing Arts Centre may experience delays on the roads around the centre during construction and as the centre shares the Civic Centre car park due to construction related activity.

Access into the Museum of Fire would be impacted during construction activities due to changes to the Castlereagh Road / Museum Drive intersection. This is especially relevant during the museum’s major annual events, such as the Penrith Working Truck Show, which can attract high numbers of visitors. These events need to be taken into consideration for construction staging timing and traffic management planning. Access to the museum would be maintained at all times except where negotiated with the museum’s management. The Museum of Fire sign would not be impacted by construction activities.

While the Penrith Showgrounds is located approximately 600m from the proposal site, it is possible that traffic in the area may be impacted by construction related activities through delays and stoppages. This traffic may also impact Penrith Stadium (Pepper Stadium) and the Penrith Panthers Entertainment, Leisure and Sporting Precinct, especially when hosting home games at the stadium or other major events.

5.1.7.3 Other

While located outside the proposal site, residents of the Mountain View Aged Care and Retirement Village may be impacted by changes to footpaths in and around the proposal site. As described in this report, the residents of the aged care and retirement village are less likely to own private vehicles. For those who are mobile, access to the Penrith CBD may be undertaken on foot using footpaths and road crossings in and around the proposal site. Changes to this infrastructure due to construction activities may impact their ability to access services within the Penrith CBD. Traffic management and temporary footpath planning should take into consideration the current users of this infrastructure and their needs.

5.1.8 Economic

The proposal would not have a direct impact on the economic profile of the proposal site or its surrounds as the proposal does not require cessation of residential or business uses on any properties and does not require any changes to where people live or work.

Section 3.5.8 describes transport cost indicators used to quantify the cost of stoppages and traffic congestion. In relation to transport cost indicators, vehicle stops and travel times are likely to increase during construction which will add some ‘cost’ to these activities for the duration of construction.

5.1.9 Business and industry

There are a number of businesses directly adjacent to the proposal site that would be impacted by construction activities.

The reconfiguration of the Museum Drive / Castlereagh Road intersection would impact ingress and egress from the Lion Dairy. The new intersection layout will be a left in, left out arrangement directly off Castlereagh Road.

As described in section 3.7.2 Lion Dairy and Drinks is a milk processing and manufacturing facility which operates 24/7. It is serviced by approximately 30 milk tankers and 40 distribution vehicles daily (including high vehicles and B-Doubles) with additional truck deliveries (i.e. for plastics and other materials) occurring as required. Truck access to the Lion Dairy and Drinks site would be maintained at all times during construction.

The current administration car park located at the front of the dairy occupies RMS land that will be utilised in the road infrastructure upgrade. From the start of construction 20-25 car parks will be removed from this area, however these car parks will be relocated during construction, likely to the north the main building.

This change has been discussed with the dairy's management and will be incorporated into traffic management planning.

As described in section 5.1.1, a small area of land (approximately 150m^2) would be acquired from the Sinclair Motors future development site (located on the corner of High Street and Mulgoa Road) to allow for the expansion of the road footprint. While a Development Application for this site has not yet been lodged with Council, this boundary realignment would impact on future planning for the site. RMS will consult with the landowner and Council to address this issue.

While located outside the proposal site, Westfield Penrith is a large generator of road traffic in the local area. While construction activities will not have a direct impact on the Centre, existing ingress and egress issues are likely to be exacerbated by construction related traffic, especially during peak trading times. Ongoing consultation with the Centre's Management will be important to manage construction traffic related issues, especially during these peak trading times. The Penrith CBD is located to the east of the proposal site and is not directly impacted by construction activities, however people utilising services and businesses within the CBD may be impacted by construction related traffic impacts.

There are also a number of residential dwellings on High Street located adjacent to the proposal site. Some of these dwellings are used for residential purposes, some for business or community services. As described in section 5.1.2 people who utilise these dwellings are likely to experience amenity related construction impacts associated with noise, vibration and dust. They are also likely to be impacted by construction activities that create traffic impacts and short term access impacts.

5.1.10 Tourism and recreation impacts

No direct tourism and recreation related impacts are expected as a result of the proposal, though it is noted that construction related traffic impacts may impact visitors in and around the proposal area.

5.1.11 Community values

In relation to community values, the proposal isn't expected to impact the community's overall vision for Penrith, but is likely to temporarily impact a number of outcomes that the community highlighted as important in their community plan. For example, during construction it is going to be more difficult to move through the proposal site. This area provides access to major roads and a number of businesses and community facilities, and as such construction works are likely to disrupt people's movements and cause some level of frustration.

5.1.12 Cumulative impacts

Cumulative impacts could be experienced if construction or operation of the project coincided with construction or operation of other local development, such as other road upgrades, public works or private development. A desktop review of the major project register on the Department of Planning and Environment's

website undertaken on 1 February 2016 confirmed there are no recently approved major projects within the Penrith LGA.

The proposal forms part of the wider Mulgoa Road Corridor project, which would be constructed at a later date. Should construction programs coincide people using the Mulgoa Road Corridor may experience longer delays and greater impacts on amenity caused by multiple construction activities. Other key future developments planned for the area include the Nepean Green Bridge, the Penrith Lakes and expansion of the Penrith Panthers Entertainment, Leisure and Sporting Precinct

5.1.13 Summary of construction impacts

A summary of construction related impacts is as follows:

- Partial acquisition of 12 properties (boundary realignments) to enable expansion of the road footprint
- Full acquisition of one property that is currently road reserve
- Temporary dust, noise and visual impacts created by construction activities for residents and businesses within the proposal site
- Removal of the Penrith entry statement and 2,838 m^2 of open space from Woodriff Gardens
- Removal of vegetation from areas within the proposal site may impact people's perception of community values associated with green space and environmental protection
- Changes to the traffic environment due to construction activities are likely to cause delays and temporary stoppages in the proposal site and its surrounds. This may impact access to local residences, businesses, open space and recreation areas, Penrith Ambulance Station, the Council Civic Centre, the Joan Sutherland Performing Arts Centre, Lion Dairy, the Museum of Fire, Westfield Penrith and Penrith railway station which are all located within or adjacent to the proposal site
- During railway possessions for the railway bridge replacement, access along Castlereagh Road and the T1 Western railway line will be restricted. It is expected that this will take place on three weekends, with one rail possession extending for five days. Sydney Trains will provide replace bus services for the railway and a detour route will be provided for road traffic
- No direct impacts to social infrastructure are expected
- Potential to impact egress from the Penrith Ambulance Station and movement through the proposal site if the ambulance station remains an operational facility within the proposal site during construction
- Existing indented bus bay on High Street within the proposal site will be relocated during construction and a temporary stop would be used for the duration
- Pedestrians and cyclists using active transport infrastructure within the proposal site may also be impacted by traffic changes, detours and stoppages during construction

- Removal of 20-25 car parks from the Lion Dairy during construction – these will be relocated during the construction phase.

5.2 Operation phase impacts

5.2.1 Property impacts

Once operational, the proposal is not expected to have any additional property impacts.

In relation to driveway accesses, access to and from the Lion Diary will be maintained in its current form. Access and egress from the tennis courts would be maintained in its current form. It is assumed that by the time the proposal is operational the Penrith Ambulance Station would have moved to its new location and the emergency egress arrangement will cease to operate. However, if this is not the case, existing emergency egress arrangement will be maintained.

5.2.2 Amenity impacts

Increases in noise levels as a result of the proposal are predicted to be less than 2dB which is within the recommended design exceedance thresholds and would not be a perceptible increase in noise for nearby receptors. See section 6.5.4 of the REF for more information about predicted noise impacts.

Air quality impacts are not expected as a result of operation of the proposal. See section 6.12.2.

Once operational, a number of new visual elements would be integrated into the proposal site. This includes formal median tree planting on Mulgoa Road, High Street and Castlereagh Road and central media planting on Jane Street and High Street (see Figure 18 and Figure 19 for an artist's impression of this planting). New informal tree planting will be undertaken along the edges of the road alignment where relevant. A new gateway feature will replace the Penrith entry statement. The Museum of Fire signage will remain in its current location.

The new rail overbridge would be designed to meet Railcorp requirements and as such would be aesthetically a utilitarian structure. The rail bridge will be accompanied by retaining walls on both sides of Castlereagh Road either side of the rail bridge. Through colour, patterning or public artwork, it is proposed that these retaining walls would be used to create a feature within the road corridor. These landscaping and urban design features will have a beneficial impact on road corridor by introducing vegetation and design features to break up the corridor and increase visual amenity in the area. See section 6.6 of the REF for additional detail about landscape and urban design treatments.

5.2.3 Travel behaviour

When operational the proposal will reduce congestion and delays at the Jane Street/Castlereagh Road and Mulgoa Road/High Street/ Great Western Highway intersections during peak hour periods. This will enable traffic to flow freely reducing stoppages and increasing average travel times through this area.

5.2.4 Public transport

In relation to public transport, a bus priority ('queue-jump') lane would be introduced at Jane Street and High Street which will improve access for buses in this area. The existing High Street indented bus bay would also be re-provided.

Figure 18 Artist's impressions of Jane Street / Castlereagh Road intersection with new bus priority lane.

Figure 19 Artist's impressions of High Street / Mulgoa Road intersection with new bus priority lanes.

5.2.5 Active transport

In relation to active transport, a 4.5m wide shared path would be installed along the eastern side of Mulgoa Road - Castlereagh Road to complement the existing

shared pathways in and around the proposal site (see Figure 20). A staged pedestrian crossing on Mulgoa Road-Castlereagh Road would also be introduced in the proposal. These improvements to active transport infrastructure will contribute to safe and effective pedestrian and cycling linkages between the Nepean River Green Bridge, Penrith railway station and the Penrith CBD.

Figure 20 Artist's impression of the new shared path along the eastern side of Castlereagh Road

5.2.6 Car parking

Once operational, the proposal will have no further impacts on car parking in the local area.

5.2.7 Social infrastructure

Overall, access to social infrastructure within the proposal site would be improved by operation of the proposal. This will be achieved by improved traffic flows in the local area.

There will be no additional impacts to Woodriff Gardens once the proposal is operational. The new Penrith gateway feature would be installed to replace the existing planted area, additional information parklands tree planting would be undertaken and verge planting would be completed. These elements would re-form the edges of the gardens that were impacted by construction.

There will be no change to the Nepean District Tennis Association once the proposal is operational. Access to and egress from the tennis courts will remain unchanged.

It is expected that the Penrith Ambulance Station would have moved to its new location further up High Street by the time the proposal is operational. It is expected that Ambulance NSW's non-emergency response functions for the

Western Sydney and Nepean Blue Mountains Sector would continue to operate from the existing Penrith Ambulance Station. Emergency egress would therefore no longer be required at this location. However, if this is not the case, the existing emergency egress arrangement would be maintained.

The boundary of the Penrith Civic Centre car park would be improved with informal parkland tree planting and verge planting to offset the removal of some mature trees from this area.

5.2.8 Economic

Once operational, road user benefit for the 30 year post construction period has been valued at $913 million (2015 dollars) in reduced travel time, vehicle stops and crash benefits.

No changes to the socio-economic environment are expected as a result of operation of the proposal. Direct impacts on business, employment and industry are also not expected to be impacted by its operation. That said indirect benefits associated with reduced traffic congestion and ability to move through the proposal are expected.

5.2.9 Business and industry

While the proposal is not expected to have any direct impact on business and industry, once operational, the proposal may provide indirect benefits to local business and industry in the form of improved access to and through the local area.

5.2.10 Tourism and recreation

No direct tourism and recreation related impacts are expected as a result of the proposal. Once operational, the proposal may provide indirect benefits to tourism and recreations in the form of improved access to and through the local area.

5.2.11 Community values

The upgraded intersections are expected to provide a range of socio-economic benefits including reduced travel times, reduced vehicle stoppages, improved safety for all users, new cycle and pedestrian infrastructure and new urban and landscape design elements to improve amenity as much as possible.

While it is recognised that roads and intersections in the area will be larger in scale and ‘busyness’, landscaping and urban design elements would be included in the road corridor to break up the bulk of the road corridor as much as possible. This would assist with Council’s vision to maintain a ‘green’ visual link down to the Nepean River.

The community values associated with moving through the city and caring for the environment are consistent with the benefits associated with the operational proposal.

5.2.12 Cumulative impacts

Once operational, improvements in this section of the Mulgoa Road corridor will complement other improvements being made along the Mulgoa Road corridor.

Construction of the Nepean River Green Bridge and the proposal's new active transport infrastructure will also work together to improve pedestrian and cycle access in the local area.

5.2.13 Summary of operational impacts

A summary of operational related impacts is as follows:

- The operational proposal will reduce congestion and delays at the Jane Street/Castlereagh Road and Mulgoa Road/High Street/ Great Western Highway intersections during peak hour periods. This will enable traffic to flow freely reducing stoppages and increasing average travel times through this area
- Road user benefit for the 30 year post construction period have been valued at $913 million (2015 dollars) in reduced travel time, vehicle stops and crash benefits
- Community values associated with moving through the city and caring for the environment are consistent with the benefits associated with the operational proposal
- Additional property impacts are not expected and there will be limited changes to current access and egress arrangements within the proposal site
- Noise impacts associated with operation are not expected to be perceptible and fall within recommended design exceedance thresholds
- New visual elements (landscape and urban design elements) with the proposal site are expected to mitigate amenity impact associated with the increase in the scale of the road corridor. This landscaping is consistent with Council's strategy of enhancing the 'green' visual link between the CBD and the Nepean River
- Improvements in this area of the Mulgoa Road corridor will complement other road improvements along this corridor benefiting motorists through improved travel times and reduced congestion
- Active transport infrastructure included in the proposal would contribute to safe and effective pedestrian and cycling linkages between the Nepean River Green Bridge, Penrith station and the Penrith CBD
- Bus priority ('queue-jump') lane introduced at Jane Street and High Street which would improve access for buses in this area.

6 Mitigation and management

To address impacts and enhance benefits identified in section 5, a suite of migration and management action have been identified for the proposal's construction and operational phases.

6.1 Construction phase

6.1.1 Property impacts

- Roads and Maritime will consult with Penrith City Council, Endeavour Energy, Sydney Trains and Macbro Properties Pty Limited early in the design process to confirm property requirements
- Property impacts to Woodriff Gardens will be minimised as much as possible
- All property acquisitions to be undertaken in accordance with current Roads and Maritime guidelines including Roads and Maritime Services Land Acquisition Information Guide (Roads and Maritime Services, 2014b) and the *Land Acquisition (Just Terms Compensation) Act 1991*
- Roads and Maritime will consult with public utility providers regarding the relocation of services
- Roads and Maritime to identify construction compounds and negotiate suitable temporary lease arrangements for this land (Penrith City Council).

6.1.2 Amenity impacts

- Avoid and minimise the removal of mature tress wherever possible.
- Construction Environmental Management Plan (CEMP) to outline methods to reduce dust, noise, vibration etc
- Design and re-provide Penrith entry/gateway statement for Woodriff Gardens in consultation with Council
- RMS to continue to work with Council to integrate appropriate landscape and urban design treatment in the proposal's design
- Landscape design to investigate re-provision of vegetation within the proposal area
- Urban design and landscape treatments to be incorporated into the design as much as possible to provide a softer edge to the hard infrastructure
- Consult with stakeholders and the community about the re-provision of landscape features so they understand what will be implemented.

6.1.3 Traffic, pedestrian and cyclist impacts

- Emergency access must be maintained for Penrith Ambulance Station while the station is operational in its current location – via signals or traffic controllers. This must be integrated into traffic management planning

- Traffic management planning to incorporate actions for allowing ambulances to quickly move through the proposal site
- Schedule works in the vicinity of the Penrith Ambulance Station to occur later in the construction program to allow time for the operational facility to move – this will remove this issue
- Explore phasing of traffic lights in the local area to determine if these can be used to assist with egress from Westfield Penrith during construction activities
- Ongoing engagement with Lion Dairy management to develop suitable access and traffic management processes for the construction phase
- Investigate suitable detour route for Lion Dairy trucks for the duration of the works to minimise impacts, especially during rail bridge shut downs
- Maintain pedestrian and cycle access throughout the construction area as much as possible. Where this is not possible appropriate detour routes should be prepared and implemented to manage access impacts
- Provide temporary bus stops during construction
- Re-provide indented bus bay in High Street in design
- Construction workforce planning to include planning for workforce parking.

6.1.4 Community consultation and communication

- Preparation of stakeholder communication and engagement plan to address both pre-construction and construction activities
- Ongoing engagement with local stakeholders, residents, businesses, motorists and motoring and trucking representative bodies to discuss construction activities and traffic management
- Ongoing engagement with the Nepean and District Tennis Association to manage construction related impacts and avoid or manage impacts during tournaments and peak activity periods
- Ongoing engagement with Westfield Management to discuss construction activity impacts and timing, for example avoid the busy Christmas period (December) as much as possible
- Ongoing liaison with the Museum of Fire's management to discuss project impacts and timing, especially in relation to traffic management planning for their major events
- Ongoing engagement with the aged care and retirement facilities to discuss construction activities and timing
- Include Panthers in future engagement discussions
- Include showgrounds in future engagement discussions.

6.2 Operational phase

Once the proposal is operational there are no additional mitigation or management actions required.

7 Conclusion

The socio-economic assessment has identified that construction related impacts will be localised to the proposal site and its surrounds and are most likely to occur due to traffic and access disruptions and stakeholder specific issues associated with access and construction activity. These items will need to be carefully managed during construction to reduce the impacts as much as possible.

Key construction related impacts to be managed include:

- **Transport and access -** Disruption and changes to access will occur within the study area for all transport modes (including pedestrians and cyclists) due to construction activities. Traffic management processes and communication with stakeholders will be key management actions to address these issues. Once operational, road user benefit for the 30 year post construction period has been valued at $913 million (2015 dollars) in reduced travel time, vehicle stops and crash benefits.
- **Community values** – Some impact to community values associated with moving through the city and caring for the environment may occur due to construction related activities. Traffic management and communication about the re-provision of landscape features will be key management actions to address these issues.
- **Social infrastructure and values** – A range of specific issues have been identified for stakeholders including Woodriff Gardens, Penrith Ambulance Station, Lion Diary, Penrith City Council, Nepean and District Tennis Association, Westfield Penrith, Sydney trains, road users, railway users and bus providers and users. These issues will require careful management during the construction phase to minimise impacts as much as possible. Ongoing communication with stakeholders during construction will be a key management action to address these issues.

Once operational, significant socio-economic impacts are not expected, though it is acknowledged that roads and intersections in the area will be larger in scale and 'busyness' which may affect the amenity of the area. The upgraded intersections are expected to provide a range of socio-economic benefits including reduced travel times, reduced vehicle stoppages, improved safety for all users, new cycle and pedestrian infrastructure and new urban and landscape design elements to improve amenity as much as possible.

Key operational benefits include:

- **Transport and access** – The area will benefit from improvements to traffic flow, travel speeds and safety. New active transport facilities will also improve access and safety for users
- **Community values** – The proposal aligns with a number of community values outlined in the Penrith Community Plan including 'we can get around the city', 'we plan for future growth' and 'we care for our environment'
- **Social infrastructure and values** –The proposal will not change the function of existing social infrastructure, though it has been identified that construction

related activities may impact access to some items of social infrastructure and this will need careful management. The proposal also provides the opportunity for new urban design and landscape treatments to improve amenity in the area.

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