



Springvale Water Treatment Project

State Significant Development 7592
Environmental Impact Statement
Volume 2 - Appendix F

September 2016



Centennial Coal

Appendix F Traffic and access



Springvale Coal Pty Ltd

Springvale to Mount Piper Water Treatment Project Traffic Impact Assessment

August 2016

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1. Introduction

1.1 Overview

Springvale Coal Pty Ltd (Springvale Coal) and EnergyAustralia NSW Pty Ltd (EnergyAustralia) are seeking consent for the Water Treatment Project (the Project). The Project involves the transfer of water from existing underground mine dewatering facilities for industrial reuse at Mount Piper Power Station (MPPS) to improve environmental outcomes and water quality within the upper Cocks River catchment. GHD Pty Ltd (GHD) was commissioned to prepare a Traffic Impact Assessment (TIA) for the Project.

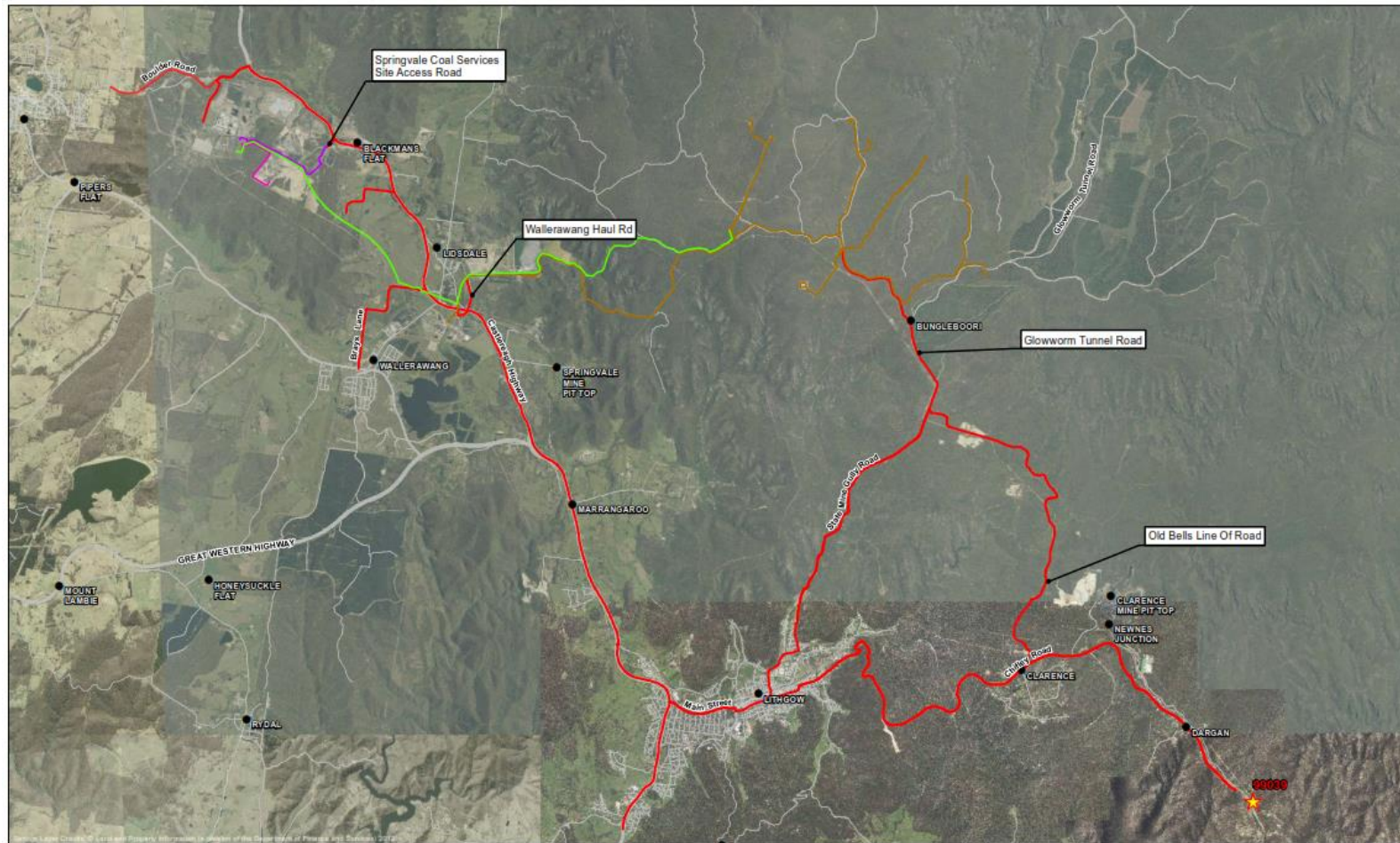
This assessment forms part of an Environmental Impact Statement (EIS) to support a State Significant Development (SSD) application for the Project under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This TIA has been prepared in accordance with relevant statutory conditions and the *Secretary's Environmental Assessment Requirements Application Number SSD 16_7592* (SEARs). It discusses the following:

- Existing conditions – a review of existing road features, adjacent developments, traffic volumes, sight distances and crash data;
- Project – provides details of the project and a review of additional traffic generated as a result of the construction works; and
- Traffic impact assessment – provides an assessment of the performance of the existing intersections (queues, delays, level of service, safety) during construction and operation of the site.

1.2 Study area/location of the Project

The Project is located at western coalfields near Lithgow and extends from the Newnes Plateau to the Mount Piper Power Station. Figure 1 provides the location of the Project in relation to the surrounding road network.

Figure 1 Local Road Network



1.3 Study assumptions and limitations

This report has been prepared by GHD for Springfield Coal Pty Ltd and EnergyAustralia Pty Ltd for inclusion into the EIS and may only be used and relied on by Springfield Coal Pty Ltd and EnergyAustralia Pty Ltd for the purpose agreed as set out in the EIS.

The report is based on information provided by Springfield Coal Pty Ltd and EnergyAustralia Pty Ltd in relation to expected proposed construction and operation activities and the associated expected traffic generation.

This study has been undertaken based on traffic count data provided from the following sources:

- Roads and Maritime Services traffic counts provided from the Roads and Maritime Traffic Volume Viewer website; and
- The *Springvale Mine Extension Project Traffic Impact Assessment* report (2013), prepared by ARC Traffic and Transport.
- The *Springvale Colliery Modification 1 Traffic Impact Assessment* (2015), prepared by ARC Traffic and Transport.

No additional traffic counts were undertaken for this study.

1.4 Secretary's Environmental Assessment Requirements

The following table provides an overview of the requirements for the traffic impact study by RMS and with respect to SEARS and the sections in the report where they have been addressed.

Table 1 Government Agency Requirements

Assessment requirements	Where addressed
<i>For the construction of the treatment plant and associated infrastructure, road transport volumes and vehicle types broken down into:</i>	
• <i>Origin and destination</i>	Section 1.1
• <i>Travel routes, including travel on both private and public roads</i>	Section 1.2, Section 4.2
• <i>Peak hours</i>	Section 2.3
<i>The study is to provide details of projected transport operations including:</i>	
• <i>Traffic volumes</i>	Section 4.1
• <i>Materials to be transported and vehicle types used for transport</i>	
• <i>Physical constraints on the haulage route</i>	Section 2.2
• <i>Access points to and from the Castlereagh Highway</i>	Section 4.2
• <i>Measures to be put in place to ensure a high level of safety for all road users interacting with construction traffic</i>	Section 4.4

Assessment requirements	Where addressed
<i>Any over size and over mass vehicles and loads expected for the construction and operation of the project.</i>	Section 2.3.2
<i>Temporary and permanent staff numbers (including employees and contractors) and staff parking arrangements during construction and operation of the project.</i>	Section 5.1

1.5 Report structure

Following this section, the report is structured as follows:

- Section 2 Existing conditions;
- Section 3 The proposal;
- Section 4 Construction traffic impact assessment;
- Section 5 Operational traffic impact; and
- Section 6 Summary and conclusions.

2. Existing conditions

This section outlines the existing conditions around the proposal including traffic conditions on roads in the vicinity of the site. This includes the existing transport and accessibility conditions and the existing road network performance.

2.1 Overview

Springvale Coal Pty Ltd (Springvale Coal) and EnergyAustralia NSW Pty Ltd (EnergyAustralia) are proposing the Water Treatment Project (the Project) to improve environmental outcomes and water quality in the Upper Cocks River catchment. The Project is located to the east of Portland and south of Castlereagh Highway.

The Project involves the establishment of a pipeline and ancillary facilities to transfer water from existing dewatering facilities on the Newnes Plateau for treatment and industrial reuse at Mount Piper Power Station (MPPS). A detailed description of the Project is provided in Chapter 5 of Volume 1 in the EIS.

Access to MPPS and the water treatment plant would be via Castlereagh Highway and Boulder Road. Access to the pipeline route in the vicinity of Lidsdale and the proposed new licensed discharge point would be along Castlereagh Highway and Boulder Road. Primary access to the Newnes Plateau for heavy vehicles would exclusively be via Chifley Road and Old Bells Line of Roads and light vehicles will use State Mine Gully Road.

2.2 Existing road network characteristics

This section provides an understanding of the existing road network surrounding the Project.

Roads are classified according to the functions that they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies, which guide the management of the road according to their intended service or qualities. Functional road classification involves the relative balance of the mobility and access functions.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions within Sydney, and throughout the State. State roads are the responsibility of the Roads and Maritime Services to fund, prioritise and carry out works. State roads generally include roads classified as Freeways, State Highways, and Main Roads under the *1993 Roads Act*, and the regulation to manage the road system is stated in the Australian Road Rules (1999).

NSW Roads and Maritime Services define four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

- **Arterial Roads** – controlled by RMS, typically no limit in flow and designed to carry vehicles long distance between regional centres.
- **Sub-Arterial Roads** – can be managed by either council or RMS under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region, or provide connectivity from arterial road routes (regional links).
- **Collector Roads** – provide connectivity between local sites and the arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.
- **Local Roads** – provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.2.1 Key roads

Key roads relevant to the Project include:

- Castlereagh Highway
- Boulder Road
- Main Street
- Chifley Road
- Old Bells Line of Road
- State Mine Gully Road / Glowworm Tunnel Road

2.2.2 Castlereagh Highway

Castlereagh Highway (Route No. B55) is a state highway forming part of the Great Western Highway that runs in a north-westerly direction from Marrangaroo to central NSW via Lidsdale. The proposed pipeline traverses Castlereagh Highway south of Lidsdale. Castlereagh Highway provides access to Boulder Road, which provides direct access to MPPS. Castlereagh Highway also provides direct access to several properties east of MPPS and Springvale Coal Services at Noon Street.

Castlereagh Highway has the following characteristics:

- Two-way sealed carriageway, undivided single lane highway in a rural environment;
- Double white continuous lines;
- Sealed shoulders between Boulder Road to approximately 150 m east of overpass over Castlereagh Highway and Coxs River approach to Lidsdale;
- Unsealed shoulders between approximately 150 m east of overpass over Castlereagh Highway to Coxs River;
- Default speed limit of 100 km/h; and
- Annual average daily traffic of 5,786 vehicles per day.

Figure 2 Castlereagh Highway viewed northwards towards Boulder Road



Source: Google Maps (2016)

2.2.3 Boulder Road

Boulder Road is a sub-arterial road that provides a link to Portland town centre from Castlereagh Highway. Boulder Road also provides access to MPPS in two locations.

Boulder Road has the following characteristics:

- Two-way sealed carriageway; predominately contains one lane in each direction and slip lanes where there is access provision to a side road, two lanes in each direction in the vicinity of the Mount Piper Power Station;
- Predominately broken white centrelines with double unbroken centreline at in the vicinity of a steep cliff along the side of the road;
- No road shoulders; and
- Sign posted speed limit of 60 km/h.

Figure 3 Boulder Road viewed northwards towards Castlereagh Highway



Source: Google Maps (2016)

2.2.4 Main Street

Main Street performs as a collector road that provides a link to the town of Lithgow from the Great Western Highway (A32). Main Street runs through the main business strip of Lithgow in a west to east direction and forms part of State Route 59 as it connects to Chifley Road via Mort Street.

Main Street generally has the following characteristics:

- Two-way sealed carriageway with lanes in each direction;
- Solid white centrelines;
- Sealed road shoulders with available on-street parking in select locations;
- Sign posted speed limit of 50 km/h,
- 40 km/h during school hours between Rifle Parade and Academy St in the vicinity of Coerwull Public School;
- Passes through the business strip of Lithgow.

Figure 4 Main Street viewed westwards towards Great Western Highway



Source: Google Maps (2016)

2.2.5 Chifley Road

Chifley Road is a continuation of the Bells Line of Road which is a sub-arterial road which runs from North Richmond on the north-western outskirts of Sydney to Bell (at the intersection with the Darling Causeway). At this point the road becomes Chifley Road which then travels through the locality of Clarence into Lithgow on the western side of the Blue Mountains. Chifley Road provides a link to Newnes Junction from Lithgow via Clarence.

Chifley Road has the following characteristics:

- Two-way sealed carriageway with one lane in each direction;
- Predominately broken white centreline, but double unbroken line in large bend locations;
- No road shoulders; and
- Sign posted speed limit of 80 km/h eastwards and 60 km/h westwards.

Figure 5 Chifley Road viewed eastwards towards Newnes Junction



Source: Google Maps (2016)

2.2.6 Old Bells Line of Road

Old Bells Line of Road extends from Chifley Road at Clarence and provides access to the Newnes State Forest. Old Bells Line of Road is a well maintained gravel road, which provides primary access for large logging vehicles and heavy vehicles accessing the existing mine dewatering facilities on the Newnes Plateau. Old Bells Line of Road has the following characteristics:

- Unsealed / gravel road, which is approximately 5.5 m wide; and
- Suitable for two-way traffic

2.2.7 State Mine Gully Road / Glowworm Tunnel Road

State Mine Gully Road is a road that provides access to the Newnes State Forest from the north of Lithgow. Glowworm Tunnel Road is a continuation of State Mine Gully Road to the north of where it forms a T-intersection with Old Bells Line of Road. Glowworm Tunnel Road provides access to the Newnes Plateau.

State Mine Gully Road has the following characteristics:

- Sealed road extending north for approximately 1.5 km;
- No line-marking; and
- Suitable for two-way traffic.

Glowworm Tunnel Road has the following characteristics:

- Unsealed / gravel road, which is approximately 4 m wide; and
- Suitable for two-way traffic.

2.2.8 Mayinygu Marragu Trail

Mayinygu Marragu Trail forms a priority controlled T-intersection with Glowworm Tunnel Road, near Bungleboori, and then continues to the north-west.

Mayinygu Marragu Trail has the following characteristics:

- Unsealed / gravel road, which is approximately 5.5 m wide.

2.2.9 Access Tracks

There are a number of minor access tracks located off Mayinygu Marragu Trail and Glowworm Tunnel Road. Some of these tracks have been upgraded to provide access to the existing mine dewatering infrastructure as a result of previous projects in Newnes Plateau.

The tracks are around five metres wide and include a track from Mayinygu Marragu Trail, a track located north of Glowworm Tunnel Road and a track located south of Glowworm Tunnel Road. The latter two tracks were constructed to provide access to bores for a previous mining project in Newnes Plateau.

2.2.10 Sunnyside Road

Sunnyside Ridge Road is a forestry road that runs from the intersection with Mayinygu Marragu Trail to the north-west of a service bore. Sunnyside Ridge Road has the following characteristics:

- Unsealed carriageway, which is approximately 6 m wide.

2.3 Existing road network performance

This section provides an understanding of current traffic volumes.

2.3.1 Existing daily and peak hour traffic

Traffic count data was obtained from the following sources:

- NSW Roads and Maritime Services Traffic Volume Viewer website;
- *Springvale Extension Project Traffic Impact Assessment* report (2013) prepared by ARC Traffic and Transport; and
- The *Springvale Colliery Modification 1 Traffic Impact Assessment* (2015), prepared by ARC Traffic and Transport.

Castlereagh Highway

Traffic count data for the Castlereagh Highway was obtained from the *Springvale Colliery Modification 1 Traffic Impact Assessment* (2015), prepared by ARC Traffic and Transport. The peak hour and daily traffic volumes are summarised in Table 2, with a copy of the traffic count data provided at Appendix A.

Table 2 2013 surveyed traffic volumes

Location	AM Peak Hour (vph)		PM Peak Hour (vph)		Daily* (vpd)
	Northbound	Southbound	Northbound	Southbound	
Castlereagh Highway	141	264	225	269	5,786

Note: *Vpd - Vehicles per day

Chifley Road

Traffic volumes for Chifley Road were obtained from the NSW Roads and Maritime Services Traffic Volume Viewer website (counter station ID 99037, located approximately 190 m north of Darling Causeway in Bell). The traffic volumes provided are four hour volumes. The 2009 peak hour and daily traffic volumes are summarised in Table 3, assuming the peak hour volumes are a third of the peak four hour volumes, for a conservative assessment.

Table 3 2009 surveyed traffic volumes – Station ID 99037

Location	AM Peak (vph)		PM Peak (vph)		Daily* (vpd)
	Eastbound	Westbound	Eastbound	Westbound	
Chifley Road Period – 4 hour	211	451	372	581	3,059
Chifley Road Period – peak hour	70	150	124	194	

Note: *Vpd - Vehicles per day

Newnes State Forest Roads

Traffic count data for the roads within the Newnes State Forest area was obtained from the *Springvale Extension Project Traffic Impact Assessment* report (2013) prepared by ARC Traffic and Transport. This traffic data was surveyed in 2011 during the mid-year school holiday break, using automatic traffic counters.

A summary of the surveyed peak hour and daily traffic volumes is provided in Table 4. The peak hour traffic volumes along these roads are low, with less than 100 two-way traffic movements during peak hours.

Table 4 2011 surveyed traffic volumes

Location	AM Peak Hour (vph)	PM Peak Hour (vph)	Daily* (vpd)
Mine Access Road	13	88	523
Old Bells Line of Road	12	11	104
Glowworm Tunnel Road	9	12	91
Sunnyside Ridge Road	6	5	39

Note: *Vpd - Vehicles per day

Based on the existing traffic volumes shown in Table 2, Table 3 and Table 4, all roads within the study area are within expected functional classification as outlined in Section 2.2.

2.3.2 Heavy and light vehicle ratio

Based on 2013 traffic count data from *Springvale Colliery Modification 1 Traffic Impact Assessment* (2015), the heavy vehicle (HV) and light vehicle (LV) usage percentage for the Castlereagh Highway in the study area is shown in Table 5.

Table 5 Heavy vehicle proportion (2013 count data)

Location	LV* %	HV* %
Castlereagh Highway	87%	13%

The most recent available data for the proportion of heavy vehicles at Chifley Road was for 2006. It should be noted that no heavy vehicle count data was available for the 2009 traffic counts. The heavy vehicle percentage for Chifley Road in the study area is shown in Table 7

Table 6 Heavy vehicle proportion (2006 count data) – Station ID 99037

Location	LV* %	HCV* %
Chifley Road	98%	2%

The proportion of heavy vehicles and light vehicles on the access roads within the Newnes State Forest are summarised in Table 9, based on 2011 surveyed traffic data provided from the *Springvale Extension Project TIA* report (2013). Old Bells Line of Road was found to have the highest heavy vehicle proportion, with 38 percent of survey vehicles being heavy vehicles. However, the traffic count data in Table 4 indicates that only 104 vehicles per day were surveyed along Old Bells Line of Road.

Table 7 Heavy vehicle proportion (2011 count data)

Location	LV* %	HCV* %
Old Bells Line of Road	62%	38%
Glowworm Tunnel Road	68%	32%
Sunnyside Ridge Road	79%	21%

2.3.1 Midblock Level of Service Criteria

Roads are to be assessed based with reference to their general traffic carrying capacity and traffic demands. Table 4.5 of the Roads and Maritime *Guide to Traffic Generating Developments* (2002) sets out two-way hourly road capacities for two-lane roads for different levels of service, with a design speed of 100 km/hr, based on different terrain types. The capacity assumes a 60/40 directional split of traffic.

The level of service criteria is shown in Table 8. Roads and Maritime generally require Level of Service (LoS) C operations for major roads during weekday peak hours and LoS D for weekend / recreational periods.

Where design speeds of 80 km/hr are used, the resulting capacities are between 85-95% of the figures quoted, depending on the level of service. peak hour flow on two-lane rural roads (veh/hr) (Design speed of 100 km/hr).

Table 8 Peak Hour Flow on two-lane rural roads (veh/h) – Design speed of 100 km/h

Terrain	Level of Service	Percent of Heavy Vehicles			
		0	5	10	15
Level	B	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290
Rolling	B	500	420	360	310
	C	920	760	650	570
	D	1370	1140	970	700
	E	2420	2000	1720	1510
Mountainous	B	340	230	180	150
	C	600	410	320	260
	D	1050	680	500	400
	E	2160	1400	1040	820

Source: Roads and Maritime Guide to Traffic Generating Developments (2002)

The LoS criteria shown in Table 8 is based on conditions which are generally represented along the Castlereagh highway, including

- A 60 / 40 split of traffic during peak periods;
- Level terrain;
- Wide traffic lanes with shoulders / side clearances of at least 2 metres in width

Based on the traffic count data provided in Table 2 and Table 5 and the LoS criteria shown in Table 8, the Castlereagh Highway has the.

- Los B during the AM peak with 405 two-way traffic movements and 13 percent heavy vehicles
- Los C during the PM peak with 674 two-way traffic movements and 13 percent heavy vehicles

The above analysis indicates that the current traffic volumes along the Castlereagh Highway operates within the Roads and Maritime recommended operating performance standards.

2.4 Crash analysis

Crash history data for the five-year period from 2009 to 2013 was obtained from Transport for NSW for the study area.

Castlereagh Highway

The section of the Castlereagh Highway between Boulder Road and Wolgan Road is one of the areas of interest and the data is summarised as follows:

There were seven crashes recorded over this section, of these:

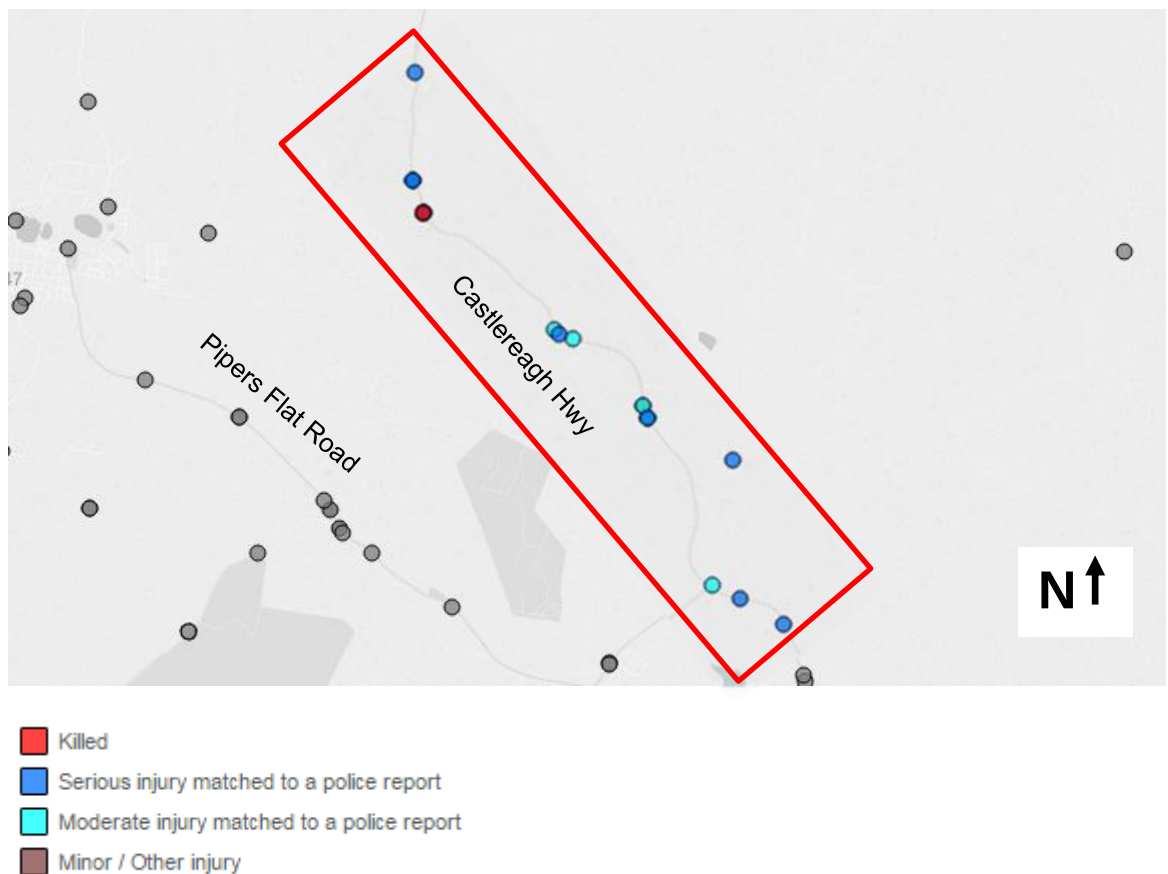
- One (14%) resulted in a fatality;

- Six (86%) resulted in injuries;
- Two (29%) were considered serious injuries;
- Four (57%) were considered moderate injuries; and
- No minor injuries were recorded during this period.

Crashes were fairly scattered along the section of the highway as can be seen in Figure 6. A review of the crash data found the following:

- There were two locations observed which had a concentration of accidents, including.
 - at the bend in the road to the north of Springvale Coal Services (the location of an access road forming an intersection with Castlereagh Highway) to the west of Noon St. Three accidents resulting in moderate to major injuries.
 - to the south of View Street, where two crashes were recorded, which resulted in moderate and major injuries.
- The crash resulting in the fatality occurred at the intersection of Castlereagh Highway and Boulder Road.
- The crash observed at the intersection of Castlereagh Highway and Main Street resulted in a moderate rated injury.
- The general trend shows that the majority of crashes occurred at and around intersection locations.

Figure 6 Crash locations - MPPS study area between 2009 and 2013



Source: Transport for NSW, NSW crash data (2015) – Modified by GHD

Chifley Road

The section of Chifley Road east of Lithgow town centre and Clarence town centre is the second area of interest and the data, shown in Figure 7, and summarised as follows:

There were 23 crashes recorded over this section, of these:

- No crashes (0%) resulted in fatalities;
- 17 (74%) resulted in injuries;
- Seven (30%) resulted in serious injuries;
- 11 (48%) resulted in moderate injuries;
- Six (26%) resulted in minor / other injuries.

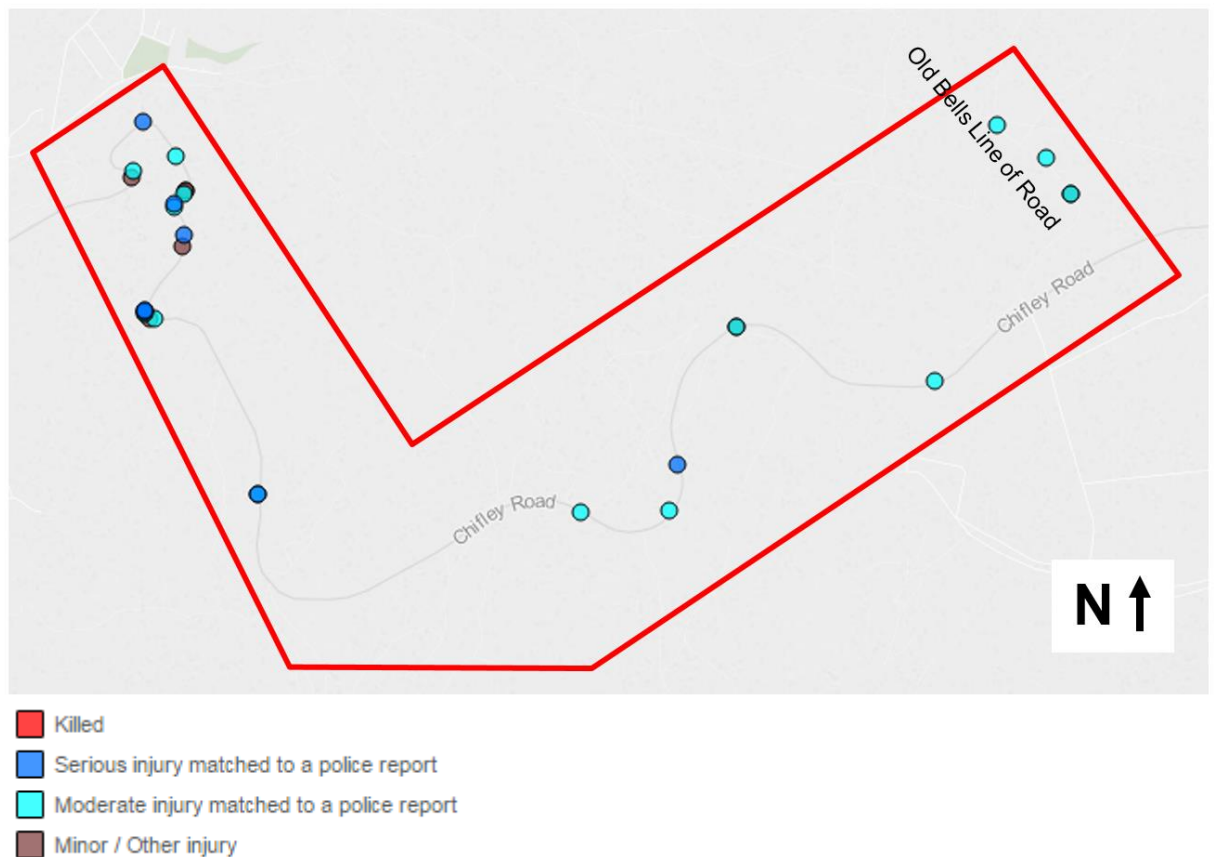
There were a high number of crashes clustered in within the western section of Chifley Road. These incidents appear to have occurred near hairpin and road bend locations. In this location, 16 crashes were recorded over the five-year period.

It was also noted that the majority of these accidents resulted in a serious injury. Current traffic calming measures include advisory speed reduction signs and chevron signs through the road bends. The signposted recommended speed through these bends in the road is 35 km/h.

Elsewhere, crashes generally occurred at separate locations dispersed along Chifley Road. These generally occurred at bends in the road, rather than along straight sections of road. The bends in these areas consist of a larger turning radius than the locations of the hairpin-like turns where a number of crashes were observed.

The general trends in this study section shows that crashes happened in curved road segments.

Figure 7 Crash locations - Pipeline study area between 2009 and 2013



Source: Transport for NSW, NSW crash data (2015) – Modified by GHD

Newnes State Forest Roads

Crash data analysis from the *Springvale Mine Extension Project Traffic Impact Assessment* report (2013) indicates that between 2006 and 2011, a total of 16 accidents were recorded along roads within the Newnes State Forest. All of these crashes resulted in injuries, with no fatalities recorded. The report concluded that speed was a factor resulting in the accidents.

Of the crashes recorded during this period:

- Eight crashes occurred on the Old Bells Line of Road, including four to the north of Chifley Road;
- Two crashes were recorded along Glowworm Tunnel Road; and
- One crash was reported on the Maiyingu Marragu Trail, west of the Bungleboori picnic area.

A map showing the crash locations within the NCF is provided at Appendix B.

2.5 Public transport

2.5.1 Bus routes

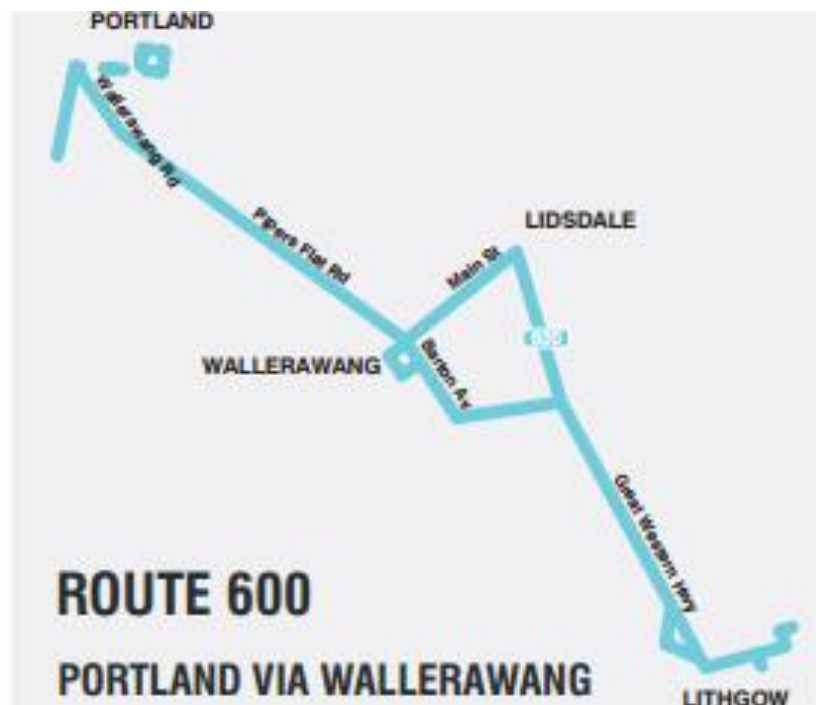
Buses that service this area are a part of the Lithgow Buslines bus service network. Two bus routes service this area. They are the route no. 600 and route no. 636.

Bus route No. 600 travels between Lithgow to Portland via Wallerawang. A diagrammatic map of the route is provided below in Figure 8.

There is approximately one bus service operating every hour from Monday to Friday between 6:30 AM and 6:30 PM. Only two services complete a return trip from Lithgow and back. There are two services on Saturdays, the AM service starts in Lithgow and ends in Portland at the RSL Club stop. The PM service starts at the RSL Club stop in Portland and goes the opposite way.

A copy of the Route no. 600 timetable is provided in Appendix C.

Figure 8 Route 600



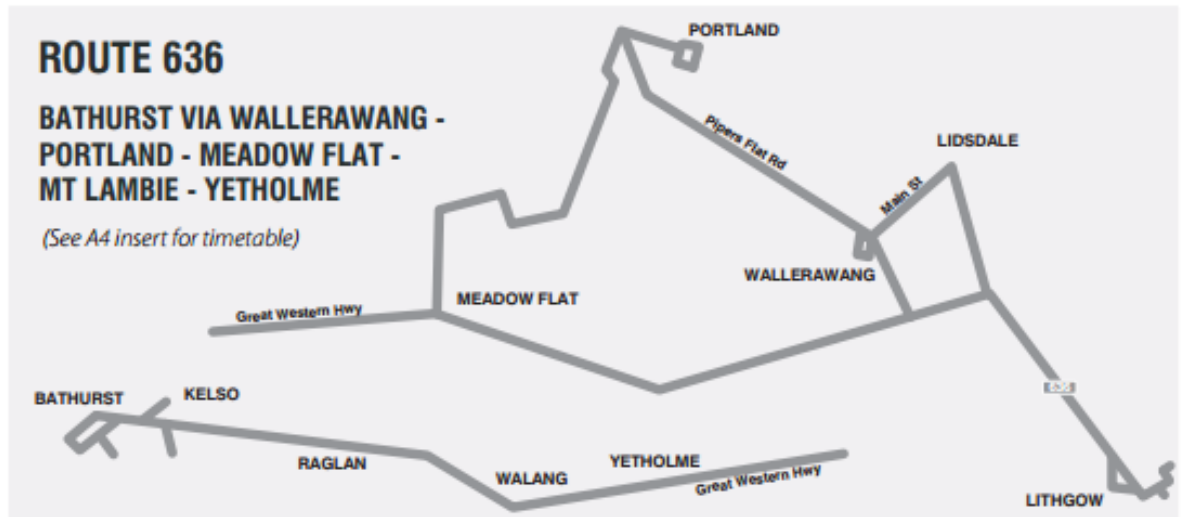
Source: <http://www.buslinesgroup.com.au/images/pdf/lithgow/Lithgow.pdf>

Bus route No. 636 travels between Bathurst to Lithgow and return. A diagrammatic map of the route is provided below in Figure 9.

There are six services between Lithgow and Bathurst from Monday to Friday made up from three services each way. There is one service in the AM period (7:00 AM to 11:00 AM) starting in Lithgow, arriving in Bathurst and return to Lithgow. In the PM period (1:30 PM to 6:30 PM) there are two services with similar stop destinations to the AM period, that is, starting in Lithgow, arriving in Bathurst and return to Lithgow. There are several stops along the route that are not serviced.

A copy of the Route no. 636 timetable is provided in Appendix C.

Figure 9 Route 636



Source: <http://www.buslinesgroup.com.au/images/pdf/lithgow/Lithgow.pdf>

2.6 Key findings

The existing traffic volumes on the roads within the study area are within their expected functional road classifications.

The crash analysis demonstrated that while crashes are generally spread out along the construction access routes, there were two locations where crashes were concentrated in a localised area. There were no recorded crashes at the intersection of Boulder Road and the MPPS access.

3. The project

3.1 Project overview

Springvale Coal and EnergyAustralia are proposing to construct the Water Treatment Project (the Project), to improve environmental outcomes and water quality in the Upper Cocks River catchment. The Project involves establishing a pipeline and ancillary facilities to transfer water from the existing dewatering facilities on the Newnes Plateau for treatment and reuse at Muont Piper Power Station.

Traffic movements on the local road network will temporarily increase during the construction phase of the works and will reduce back to only those movements required for maintenance and operational purposes at the completion of the construction phase.

3.2 Proposed construction timeframe

The construction of the water transfer system (pipelines and associated infrastructure) is expected to be undertaken over a 12 month period. Construction of the water treatment plant is expected to be undertaken concurrently, over an 18 month period. The crystalliser has a longer lead time and construction of the crystalliser is expected to take a further 12 months, following completion of construction of the water treatment plant.

3.3 Construction hours

Construction hours are to be consistent with recommended construction hours and are likely to be between 7 am and 6 pm on weekdays and between 8 am and 1 pm on Saturdays. No construction activities would occur on Sundays or public holidays. The recommended standard construction hours are shown in Table 9.

Table 9 Recommended standard hours for construction work

Work Type	Recommended standard hours of work*
Normal construction	Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays
Blasting	Monday to Friday 9 am to 5 pm Saturday 9 am to 1 pm No blasting on Sundays or public holidays

Source: *Interim Construction Noise Guideline*, Department of Environmental & Climate Change NSW (2009)

*The relevant authority (consent, determining or regulatory) may impose more or less stringent construction hours.

4. Construction traffic impact assessment

This section assesses the impacts on the local road network as a result of the construction works associated with the Project.

4.1 Projected traffic generation

Construction hours at the sites are expected to be between 7 am and 6 pm for Monday to Friday and between 8 am and 1 pm on Saturdays (as per Section 3.3). It is assumed that construction workers would arrive and depart based on the hours of construction, which results in the following assumed peak hours

- Weekday AM peak hour between 6 am to 7 am;
- Weekday PM peak hour between 6 pm to 7 pm;
- Weekend AM peak hour between 7 am and 8; and
- Weekend PM peak hour between 1 pm and 2 pm.

It is also assumed that vehicles associated with the transportation of materials would be spread-out throughout the day. To assess the peak hour trips, it has been assumed for a conservative assessment that 20 percent of the trucks transporting materials would arrive and depart in the peak hour and that construction workers would arrive in the AM peak and depart in the PM peak.

The number of proposed construction vehicle movements would depend on the final design and method of construction. However, the expected worst case daily movements for the construction of the mine water transfer system are estimated to be approximately:

- Four heavy vehicles accessing the site per day during the construction period – resulting in eight heavy vehicle movements per day
- Four light vehicles accessing the site per day during the construction period – resulting in eight light vehicle movements per day

The projected traffic generation for the proposal during the construction period of the mine water transfer system is summarised in Table 10.

Table 10 Traffic generation during construction (mine water transfer system construction)

Activity	AM Peak (vtph*)		PM Peak (vtph*)		Daily (vtpd**)	
	In	Out	In	Out	In	Out
Light vehicles	4	0	0	4	4	4
Heavy vehicles	1	1	1	1	4	4
TOTAL	5	1	1	5	8	8

Notes: 1. *(vtph) - vehicles trips per hour
2. **(vtpd) – vehicle trips per day

The expected worst case daily traffic movements for the construction of the water treatment plant is estimated to be approximately:

- Ten heavy vehicles accessing the site per day during the construction period – resulting in 20 heavy vehicle movements per day.
- 25 light vehicles accessing the site per day during the construction period – resulting in 50 light vehicle movements per day.

The projected traffic generation for the proposal during the construction period of the water treatment plant is summarised in Table 11.

Table 11 Traffic generation during construction (water treatment plant)

Activity	AM Peak (vtph*)		PM Peak (vtph*)		Daily (vtpd**)	
	In	Out	In	Out	In	Out
Light vehicles	25	0	0	25	25	25
Heavy vehicles	2	2	2	2	10	10
TOTAL	27	2	2	27	35	35

4.2 Traffic distribution

Based on the expected access routes and for a worst-case assessment, it has been assumed that vehicles will travel to / from the A32 Great Western Highway to the various sites.

Newnes Plateau

In relation to the Newnes Plateau, it has been assumed that light vehicles will travel to / from the Great Western Highway to the site via Main Street, Lithgow Street, Mort Street, Bridge Street and State Mine Gully Road / Glowworm Tunnel Road. Heavy vehicles will be travelling to / from the site via Chifley Road and Bells Line of Roads. Traffic movements associated with the Project is shown in Figure 10.

MPPS

To access the MPPS and water treatment plant site, it has been established that the vehicles will be accessing the site via the B55 Castlereagh Highway and Boulder Road. Both light and heavy vehicles will be travelling via the same route. These traffic movements are shown in Figure 11.

Pipeline Installation

Consideration of the period of installation of the pipeline between LDP009 and MPPS water treatment plant location has also been made as part of this assessment. During this time, construction vehicles (both light and heavy vehicles) associated with the mine water transfer system would access the construction site from Wallerawang Haul Road, Karawatha Drive, Brays Lane and Springvale Coal Services Site Access Road via Castlereagh Highway.

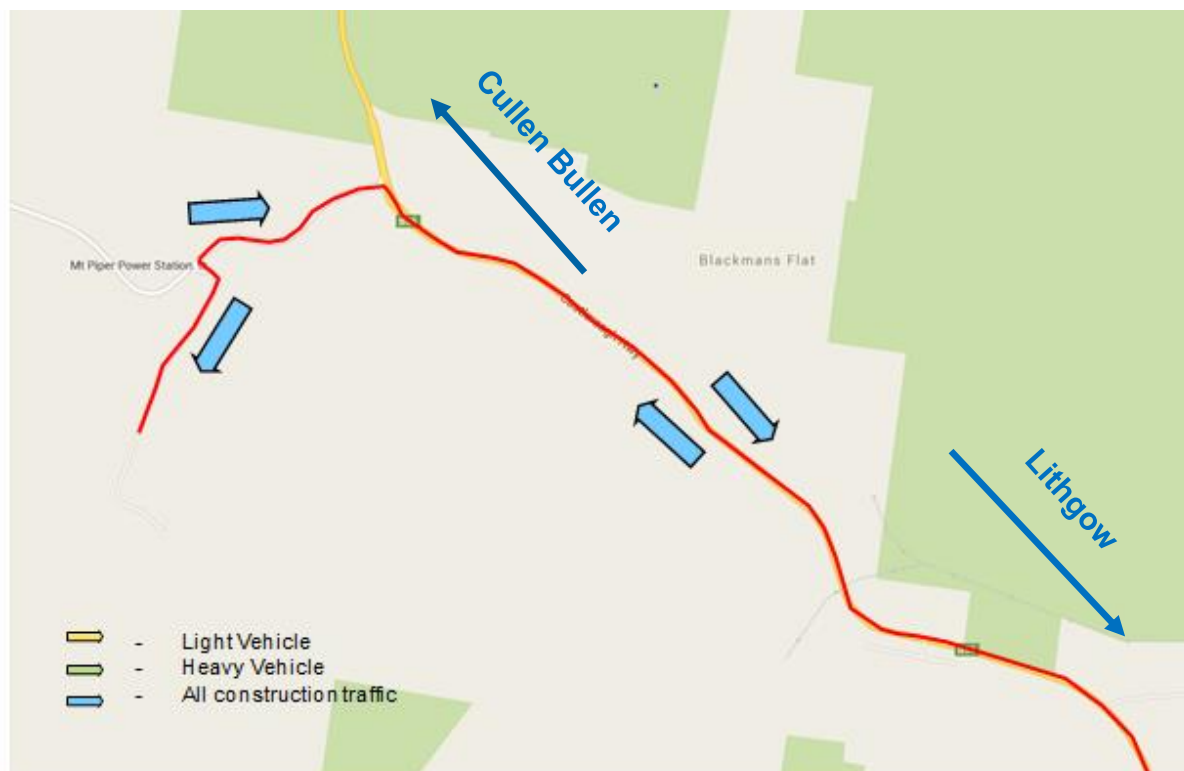
During this construction period, there would be traffic accessing the MPPS and the Pipeline Installation along the Castlereagh Highway. This construction period therefore represents the worst case period in terms of construction vehicles along the Castlereagh Highway.

Figure 10 Project traffic distribution – Newnes Plateau mine water transfer site



Source: Google Maps (2016) - modified by GHD

Figure 11 Project traffic distribution – MPPS and water treatment plant site



Source: Google Maps (2016) - modified by GHD

4.3 Mid-block assessment

During peak delivery of materials to the sites, it is expected that the proposal would generate an additional 16 and 70 vehicle movements per day for the pipeline and water plant sites respectively. The increase in traffic volumes are shown in Table 10 and Table 11.

Daily traffic volumes

Table 12 provides a summary of the expected percentage increase in daily traffic at each of the key roads within the study area as a result of the Project. The assessment has also considered the construction period where the installation of the pipeline between LDP009 and MPPS water would occur. This scenario provides a worst case assessment for construction traffic along the Castlereagh Highway, with construction vehicles associated with both the MPPS water treatment plant and pipeline construction accessing construction sites from the Castlereagh Highway.

Table 12 Expected traffic increase- daily traffic volumes (two-way)

Location	Existing Traffic (vpd)	Existing + Proposal Traffic (vpd)	Increase in Traffic (vpd)	Percentage Increase in Traffic	Vehicles per day (capacity)
Castlereagh Highway	5,786	5,856	70	1%	50,000+
Castlereagh Highway*	5,786	5,872	86	2%	50,000+
Chifley Road	3,059	3,075	16	1%	10,000 – 20,000
Old Bells Line of Road	104	112	8	8%	500 – 4,000
Glowworm Tunnel Road	91	99	8	9%	500 – 4,000
Sunnyside Ridge Road	39	47	8	20%	500 – 4,000

**This scenario takes into account the worst case assessment for Castlereagh Highway, with construction vehicles associated with mine transfer system and the pipeline installation near LDP009.*

Table 12 indicates that the Project would result in an increase in traffic of up to two percent along Castlereagh Highway and Chifley Road during peak construction periods. This small increase in traffic is considered minimal and would fall within typical daily traffic variations.

A higher percentage increase in traffic is expected along the roads within the Newnes State Forest Roads, with an increase of up to 20 percent along Sunnyside Ridge Road. However, these roads have very low surveyed traffic volumes, with around 100 vehicles per day or less accessing these roads. The results indicate that the roads will continue to operate with spare capacity in both the AM and PM peak periods. As these roads operate with spare capacity, it is expected that any cumulative traffic impacts with local forestry operations and/or projects in the area would be accommodated.

Based on this analysis, the project would have acceptable impacts to the daily traffic volumes along the roads within the Study Area. It is expected that all roads would continue to operate well within their functional classification.

Peak hour traffic volumes

A summary of the AM and PM peak hour percentage increase in traffic along the key construction traffic routes in the study area are provided in Table 13 and Table 14.

The Castlereagh Highway is a two-lane two-way highway road (one lane per direction). The Highway Capacity Manual (HCM) 2000 states that the capacity of a two-lane highway is 3,200 passenger cars per hour (pc/h) for both directions of travel combined. For the purposes of this assessment, it has been assumed that the capacity of Chiefly Road is around 900 vehicles in each direction, with a capacity of around 500 vehicles in each direction along the other roads.

Similar to the daily midblock assessment, the expected increase in peak hour traffic along the Castlereagh Highway and Chifley Road is up to nine percent.

The higher percentage increase for the Newnes State Forest Roads, is a result of the current low traffic volumes along these routes, with up to 14 two-way traffic movements along these roads during the peak hour. The small increase in traffic resulting from the proposal is also expected to have minor traffic impacts to these roads.

As mentioned earlier in the report, this expected increase in traffic will only be for the duration of the construction period.

Table 13 Expected traffic increase- AM peak hour volumes (two-way)

Location	Existing Traffic (vph)	Existing + proposal Traffic (vph)	Increase in Traffic (vph)	Percentage Increase in Traffic	Capacity Vehicles per hour (total)
Castlereagh Highway	405	434	29	7%	3,200
Castlereagh Highway*	405	440	35	9%	3,200
Chifley Road	221	223	2	1%	1,800
Old Bells Line of Road	12	14	2	17%	1,000
Glowworm Tunnel Road	9	13	4	44%	1,000
Sunnyside Ridge Road	6	8	2	33%	1,000

**This scenario takes into account the worst case assessment for Castlereagh Highway, with construction vehicles associated with mine transfer system and the pipeline installation near LDP009.*

Table 14 Expected traffic increase – PM peak hour volumes (two-way)

Location	Existing Traffic (vph)	Existing + proposal Traffic (vph)	Increase in Traffic (vph)	Percentage Increase in Traffic	Capacity Vehicles per hour (total)
Castlereagh Highway	674	703	29	4%	3,200
Castlereagh Highway*	674	709	35	5%	3,200
Chifley Road	194	196	2	1%	1,800
Old Bells Line of Road	11	13	2	18%	1,000
Glowworm Tunnel Road	12	16	4	33%	1,000
Sunnyside Ridge Road	5	7	2	40%	1,000

**This scenario takes into account the worst case assessment for Castlereagh Highway, with construction vehicles associated with mine transfer system and the pipeline installation near LDP009.*

Midblock Level of Service Assessment

- Based on the forecast peak hour traffic volumes provided in Table 13 and Table 14 and the LoS criteria shown in Table 8, the Castlereagh Highway is forecast to operate at:
 - Los B during the AM peak with 405 two-way traffic movements and 13 percent heavy vehicles; and
 - Los C during the PM peak with 709 two-way traffic movements and 13 percent heavy vehicles.

The above analysis indicates that the Castlereagh Highway would continue to operate within the Roads and Maritime recommended operating performance standards.

4.4 Mitigation measures

The following mitigation measures are recommended for the Project and implemented for the construction lifecycle:

- A Construction Traffic Management Plan (CTMP) will be developed to address the following:
 - Management and timing of heavy vehicles on Main Street and Mort Street;
 - Strict speed limits for Project vehicles in line with Forestry Corporation NSW (FCNSW) 60 km/h requirement in the Newnes State Forest in the absence of speed signs on the various access tracks;
 - Designated access routes for heavy vehicles to be clearly highlighted and adhered to;
 - Strict compliance with the safety, signage and access requirements as outlined in the Roads and Maritime *Traffic Control at Worksites* for the Project site
 - Clear and separate guidelines for the event of adverse weather conditions
- The CTMP will address the timing of trucks accessing the site to ensure there is sufficient room within the site to accommodate the vehicles.
- Consultation will be undertaken with the Coorwulla Public School and Lithgow Public School to inform them of the construction program and access route (via Main Street).
- The contractor is advised to restrict heavy vehicle movements to and from the proposal within the schools' drop off and pick up times (8 am – 9:30 am and 2:30 pm – 4 pm).

4.5 Key findings

Construction activities would occur over a two-and-a-half-year period.

Based on the current program, the construction at the water treatment plant site will take eighteen months and the installation of the crystalliser is to take a further twelve months.

During the peak construction period there would approximately be eight construction vehicles accessing the site generating 16 vehicle movements per day at the Newnes Plateau pipeline construction site. At the MPPS construction site, 35 vehicles would be accessing the site generating 70 vehicle movements per day.

The assessment has also considered the construction period where the installation of the pipeline between LDP009 and MPPS water would occur. This scenario provides a worst case assessment for construction traffic along the Castlereagh Highway, with construction vehicles associated with both the MPPS water treatment plant and pipeline construction accessing construction sites from the Castlereagh Highway.

The Castlereagh Highway is expected to continue to operate within the Roads and Maritime recommended operating performance standards, at LoS B during the weekday AM peak and LoS C during the weekday PM peak.

A CTMP specific to the site will be developed to manage potential conflicts between the day-to-day construction traffic and general traffic. The CTMP should also address the management of all vehicles associated with the project site.

5. Operational traffic impacts

5.1 Operation of the Project

It is expected that there will be less than 10 heavy vehicle trips per week (vtpw) generated from the day-to-day operation of the water treatment plant.

Currently the existing operational traffic to the MPPS is 290 staff per day. The expected additional traffic movements during the operation of the Project would be:

- Five heavy vehicles per week accessing the water treatment plant for delivery purposes – resulting in ten heavy vehicle movements per week; and
- Five light vehicles per day accessing the water treatment plant– resulting in ten light vehicle movements per day

These vehicle volumes are less than those expected to be generated during the construction phase of the Project. Approximately five light vehicles and one heavy vehicle per day are predicted during the operational phase.

5.2 Key findings

The Project would generate a low number of additional operational vehicles that would access the water treatment plant and this is deemed to not pose a constraint to the existing site access and impact upon local road users.

6. Summary and conclusions

The following key findings were identified as part of this traffic assessment:

6.1 Existing situation

- The existing traffic volumes on the surrounding road network are within the expected functional classification outlined by RMS.
- Review of the crash history for the surrounding roads indicated that generally crashes were spread along the roads. However, the analysis indicates that there are some locations with crash clusters, including at some intersections on the Castlereagh Highway and tight bends in the road along the Chifley Road construction access route.

6.2 Construction traffic impact

During the peak construction period there would approximately be eight construction vehicles accessing the site generating 16 vehicle movements per day at the Newnes Plateau for construction of the mine water transfer system.

At the water treatment plant construction site, 35 vehicles would be accessing the site generating 70 vehicle movements per day.

The assessment has also considered the construction period where the installation of the pipeline between LDP009 and MPPS water would occur. This scenario provides a worst case assessment for construction traffic along the Castlereagh Highway, with construction vehicles associated with both the MPPS water treatment plant and pipeline construction accessing construction sites from the Castlereagh Highway.

The Castlereagh Highway is expected to continue to operate within the Roads and Maritime recommended operating performance standards, at LoS B during the weekday AM peak and LoS C during the weekday PM peak.

The small increase in traffic associated with the construction activities is expected to have negligible traffic impacts.

6.3 Mitigation measures

A CTMP specific to the Project would be required to be developed to manage potential conflicts between the day-to-day construction traffic and general traffic. All vehicles shall be accommodated on site and managed in accordance with the CTMP.

6.4 Operational impact

The increase in traffic for the proposed operation post construction is projected to be minimal in the scheme of the road network. The small increase in traffic associated with the operation activities for the Project is expected to have a negligible traffic impacts.

6.5 Conclusion

In conclusion, the construction of the Project is not expected to adversely impact the traffic and road safety environment of the surrounding road network if the appropriate mitigation measures mentioned in the report are applied.

Appendices

Appendix A – Traffic Count Data

Job No	N2058
Client	ARC
Road	Castlereagh Hwy - 150m south of access Rd
Location	Lithgow
Site No.	1
Start Date	12-Nov-15
Description	Volume Summary
Direction	Combined

Average Weekday	5,786
7 Day Average	5,503

Time	Day of Week							Ave W'day	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	16-Nov	17-Nov	18-Nov	12-Nov	13-Nov	14-Nov	15-Nov		
AM Peak	373	413	411	418	433	455	433		
PM Peak	469	497	478	476	550	414	482		
0:00	22	38	54	39	48	37	32	40	39
1:00	9	20	12	13	22	21	30	15	18
2:00	11	14	17	11	15	12	13	14	13
3:00	18	17	21	22	25	14	11	21	18
4:00	39	41	36	38	39	23	9	39	32
5:00	190	174	179	180	184	111	84	181	157
6:00	353	336	334	372	326	184	97	344	286
7:00	288	310	288	303	319	186	109	302	258
8:00	373	413	411	418	412	264	144	405	348
9:00	345	334	315	338	388	327	263	344	330
10:00	367	318	365	358	398	455	332	361	370
11:00	356	305	360	357	433	342	433	362	369
12:00	344	328	320	325	446	414	477	353	379
13:00	443	367	391	383	483	355	422	413	406
14:00	372	383	408	403	500	309	482	413	408
15:00	469	497	478	476	550	336	447	494	465
16:00	425	443	469	450	474	293	414	452	424
17:00	352	360	387	404	496	331	386	400	388
18:00	266	238	261	260	335	229	260	272	264
19:00	162	159	171	164	263	136	182	184	177
20:00	109	107	130	124	209	106	110	136	128
21:00	125	126	134	126	147	91	78	132	118
22:00	50	51	61	82	91	68	47	67	64
23:00	35	32	41	46	59	58	28	43	43
Total	5523	5411	5643	5692	6662	4702	4890	5786	5503

Road Castlereagh Hwy - 150m south of access Rd
Location Lithgow
Site No. 1
Start Date 12-Nov-15
Day Weekday Ave.

M'Cycle & P'Cycle 0%
Cars 87%
LGV 7%
OGV1 & PSV 1%
OGV2 4%

Description Class Summary

	NB						SB						Combined					
	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total
0:00	0	13	1	0	3	17	0	21	1	0	1	23	0	34	2	0	4	40
1:00	0	5	0	0	4	9	0	5	1	0	0	6	0	10	1	0	4	15
2:00	0	3	0	0	5	9	0	3	1	0	1	5	0	6	1	0	6	14
3:00	0	5	1	0	5	12	0	6	0	0	3	9	0	12	1	0	8	21
4:00	0	14	2	1	4	20	0	16	0	0	2	18	0	29	3	1	6	39
5:00	0	97	15	1	7	119	0	53	3	1	5	62	0	150	18	1	12	181
6:00	1	177	29	2	8	217	1	117	4	1	6	127	2	294	33	2	14	344
7:00	0	101	21	3	7	133	0	153	10	2	5	169	1	254	31	5	12	302
8:00	0	114	18	3	6	141	0	243	12	4	6	264	0	357	30	6	12	405
9:00	1	125	14	4	6	149	2	168	9	5	11	195	3	293	23	9	17	344
10:00	1	130	14	6	7	158	2	177	11	4	9	203	3	307	26	10	16	361
11:00	1	147	16	3	9	176	0	164	8	3	10	186	2	311	24	7	19	362
12:00	1	153	15	2	5	176	1	154	9	3	9	177	2	307	23	6	15	353
13:00	2	196	21	4	6	229	1	160	12	3	8	184	3	357	33	7	14	413
14:00	1	163	14	3	5	186	1	203	12	3	8	227	2	366	26	6	13	413
15:00	1	199	15	3	8	225	3	244	11	2	9	269	3	443	26	5	17	494
16:00	0	191	20	1	8	220	2	213	8	1	8	232	2	404	28	2	16	452
17:00	1	202	13	1	5	221	1	164	7	0	7	179	2	365	20	1	11	400
18:00	1	136	9	0	6	152	2	108	5	0	5	120	3	245	13	0	11	272
19:00	0	89	6	0	5	101	0	76	2	0	5	82	0	165	8	0	10	184
20:00	0	75	6	0	3	85	0	46	1	0	4	50	0	121	7	1	7	136
21:00	0	77	8	0	3	89	0	37	1	0	5	43	0	114	9	1	8	132
22:00	0	34	3	0	2	39	0	25	0	0	2	28	0	59	4	1	4	67
23:00	1	17	1	0	2	21	0	19	1	0	2	22	1	36	2	0	3	43
Total	13	2463	264	37	127	2904	16	2575	127	35	130	2883	29	5038	391	72	257	5786

Job No	N1001		
Client	ARC		
Road	Private access Rd - to / from Mine	Average Weekday	671
Location	Springvale	7 Day Average	523
Site No.	2		
Start Date	20-Feb-13		
Description	Volume Summary		
Direction	Combined		

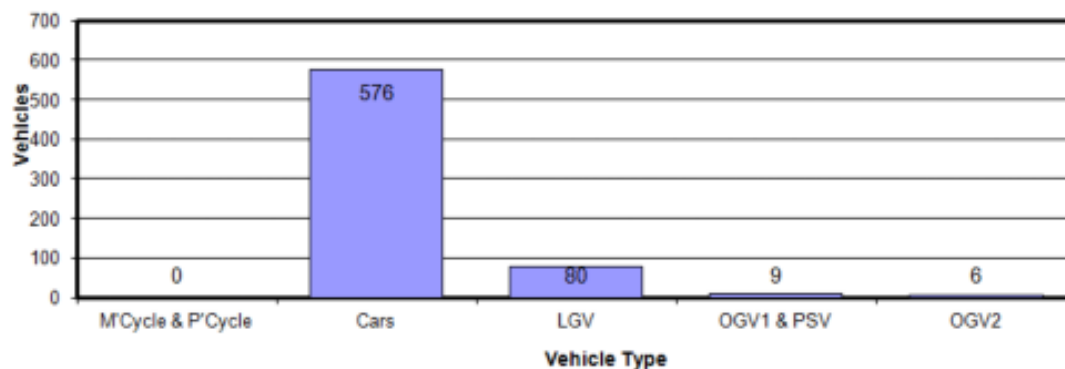
Time	Day of Week							Ave W'day	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	25-Feb	26-Feb	20-Feb	21-Feb	22-Feb	23-Feb	24-Feb		
AM Peak	123	120	117	131	74	43	40		
PM Peak	95	96	101	104	45	30	31		
0:00	0	41	40	41	38	0	0	32	23
1:00	0	0	1	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	2	1	0	5	2	2	3	2	2
4:00	5	6	8	5	9	4	3	7	6
5:00	123	120	117	131	74	43	40	113	93
6:00	42	28	42	26	31	21	14	34	29
7:00	18	28	32	22	39	1	3	28	20
8:00	18	73	63	63	56	8	1	55	40
9:00	19	25	28	18	25	2	2	23	17
10:00	20	19	20	23	31	2	0	23	16
11:00	23	30	33	35	17	1	0	28	20
12:00	18	28	19	23	21	4	0	22	16
13:00	61	72	63	54	45	10	0	59	44
14:00	21	25	29	25	37	10	6	27	22
15:00	56	54	59	42	23	4	3	47	34
16:00	95	96	101	104	23	2	4	84	61
17:00	18	25	19	15	43	30	17	24	24
18:00	12	13	12	9	33	18	31	16	18
19:00	5	7	4	7	9	4	0	6	5
20:00	3	7	4	7	2	0	2	5	4
21:00	44	40	45	44	0	0	7	35	26
22:00	1	1	5	2	0	1	1	2	2
23:00	3	3	0	4	0	0	1	2	2
Total	607	742	744	705	558	167	138	671	523

Road Private access Rd - to / from Mine
Location Springvale
Site No. 2
Start Date 20-Feb-13
Day Weekday Ave.
Description Class Summary

M'Cycle & P'Cycle	0%
Cars	86%
LGV	12%
OGV1 & PSV	1%
OGV2	1%

	NB (exiting mine)						SB (entering mine)						Combined					
	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total
0:00	0	26	5	0	0	32	0	0	0	0	0	0	0	27	5	0	0	32
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	1	0	0	0	1	0	1	0	0	0	1	0	2	0	0	0	2
4:00	0	1	0	0	0	1	0	6	0	0	0	6	0	6	0	0	0	7
5:00	0	2	0	0	0	2	0	104	7	0	0	111	0	106	7	0	0	113
6:00	0	6	1	0	0	8	0	22	3	0	1	26	0	28	4	0	1	34
7:00	0	5	2	0	1	8	0	16	3	1	0	20	0	21	5	1	1	28
8:00	0	36	6	1	0	43	0	7	4	1	0	12	0	43	10	1	1	55
9:00	0	9	2	1	0	12	0	8	2	1	0	11	0	17	4	1	1	23
10:00	0	8	3	0	0	11	0	7	3	1	0	11	0	15	6	1	0	23
11:00	0	10	3	1	0	14	0	10	3	0	0	14	0	20	5	2	1	28
12:00	0	7	2	0	0	10	0	9	2	0	1	12	0	16	5	0	1	22
13:00	0	12	3	0	1	16	0	39	4	1	0	43	0	51	7	1	1	59
14:00	0	16	3	0	0	19	0	7	2	0	0	9	0	23	4	1	0	27
15:00	0	37	4	0	0	41	0	5	1	0	0	6	0	42	5	0	0	47
16:00	0	73	6	0	0	79	0	4	1	0	0	5	0	77	7	0	0	84
17:00	0	14	2	0	0	16	0	8	1	0	0	8	0	22	2	0	0	24
18:00	0	14	1	0	0	14	0	1	0	0	0	2	0	15	1	0	0	16
19:00	0	4	1	0	0	5	0	2	0	0	0	2	0	6	1	0	0	6
20:00	0	1	1	0	0	2	0	3	0	0	0	3	0	4	1	0	0	5
21:00	0	1	0	0	0	1	0	31	2	0	0	33	0	33	2	0	0	35
22:00	0	1	0	0	0	1	0	1	0	0	0	1	0	2	0	0	0	2
23:00	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2
Total	0	285	42	5	3	336	0	291	37	4	3	336	0	576	80	9	6	671

Combined Directions



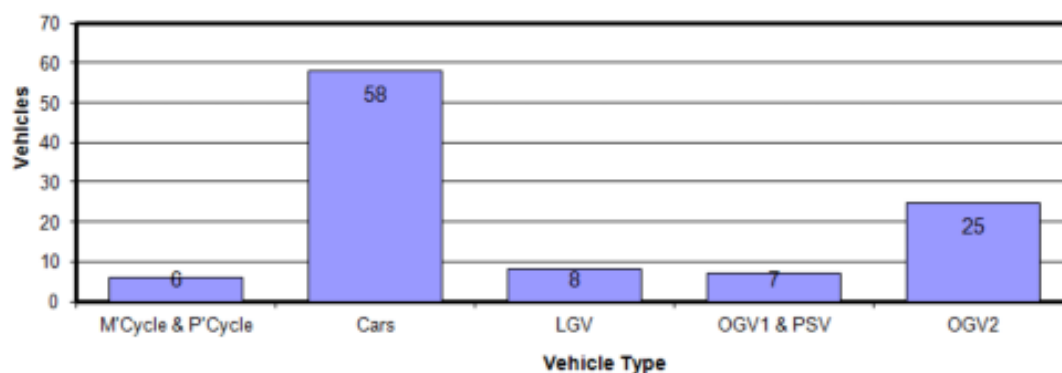
Job No	N649	
Client	ARC	
Road	Old Bells Line of Road (east of Glowworm Tunnel Rd)	Average Weekday 92
Location	Lithgow	7 Day Average 104
Site No.	3	
Start Date	15-Jul-11	
Description	Volume Summary	
Direction	Combined	

Time	Day of Week							Ave W'day	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	18-Jul	19-Jul	20-Jul	21-Jul	15-Jul	16-Jul	17-Jul		
AM Peak	11	9	8	15	16	16	24		
PM Peak	11	7	9	14	15	16	27		
0:00	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	2	9	2	8	6	0	0	5	4
5:00	9	5	8	9	14	0	1	9	7
6:00	2	0	4	7	6	1	0	4	3
7:00	2	5	5	6	5	2	1	5	4
8:00	11	8	6	15	11	16	9	10	11
9:00	4	3	6	14	16	5	14	9	9
10:00	7	6	4	5	13	8	24	7	10
11:00	8	3	6	10	9	7	13	7	8
12:00	11	7	9	14	15	5	15	11	11
13:00	4	5	9	14	9	13	13	8	10
14:00	2	2	1	10	9	16	19	5	8
15:00	4	1	4	8	5	16	27	4	9
16:00	3	1	3	1	3	12	8	2	4
17:00	2	2	0	3	2	12	9	2	4
18:00	0	0	1	0	0	1	1	0	0
19:00	0	0	0	0	6	2	0	1	1
20:00	0	0	0	0	2	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	7	0	0	1	1
23:00	0	0	0	0	1	0	0	0	0
Total	71	57	68	124	139	116	154	92	104
7-19	58	43	54	100	97	113	153	70	88
6-22	60	43	58	107	111	116	153	76	93
6-24	60	43	58	107	119	116	153	77	94
0-24	71	57	68	124	139	116	154	92	104

Road	Old Bells Line of Road (east of Glowworm Tunnel)	M'Cycle & P'Cycle	6%
Location	Lithgow	Cars	56%
Site No.	3	LGV	8%
Start Date	15-Jul-11	OGV1 & PSV	7%
Day	7 Day Ave.	OGV2	24%
Description	Class Summary		

	EB						WB						Combined					
	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	1	1	2	0	1	0	0	1	2	0	1	0	1	2	4
5:00	0	0	1	1	2	4	0	1	0	0	2	3	0	1	1	1	4	7
6:00	0	0	0	0	0	1	0	0	0	0	2	2	0	0	0	0	2	3
7:00	0	1	1	0	1	3	0	0	0	0	1	1	0	1	1	0	1	4
8:00	1	4	1	2	1	8	0	1	0	0	1	3	1	5	1	2	2	11
9:00	0	2	0	0	2	5	0	2	0	0	2	4	1	4	0	0	3	9
10:00	0	5	0	0	0	6	0	2	0	0	1	3	1	7	0	0	1	10
11:00	1	3	1	1	1	6	0	1	0	0	0	2	1	4	1	1	1	8
12:00	1	2	1	1	1	6	0	2	0	0	2	5	1	4	1	1	3	11
13:00	0	3	0	0	1	5	1	2	0	0	2	4	1	5	0	0	2	10
14:00	0	2	0	0	0	3	0	5	0	0	1	6	0	7	0	0	1	8
15:00	0	2	0	0	0	2	0	6	0	0	0	8	0	8	1	0	0	9
16:00	0	1	0	0	0	1	0	2	1	0	0	3	0	3	1	0	0	4
17:00	0	0	0	0	0	0	0	3	0	0	0	4	0	4	0	0	0	4
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	28	6	7	10	54	2	30	2	1	15	50	6	58	8	7	25	104

Combined Directions



Job No	N649
Client	ARC
Road	Glowworm Tunnel Rd (north of Old Bells Line of Rd)
Location	Lithgow
Site No.	2
Start Date	15-Jul-11
Description	Volume Summary
Direction	Combined

Average Weekday	75
7 Day Average	91

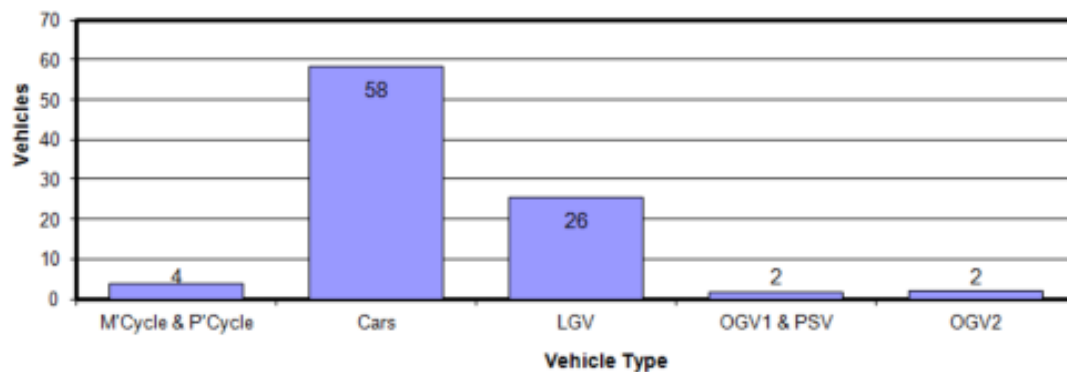
Time	Day of Week							Ave W'day	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	18-Jul	19-Jul	20-Jul	21-Jul	15-Jul	16-Jul	17-Jul		
AM Peak	8	10	8	9	10	10	27		
PM Peak	11	14	9	12	15	30	21		
0:00	1	0	0	0	0	4	0	0	1
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	2	0	0	0
3:00	3	2	3	7	1	1	0	3	2
4:00	2	2	2	0	3	0	2	2	2
5:00	1	0	0	1	5	2	1	1	1
6:00	0	0	0	0	2	0	0	0	0
7:00	1	5	4	9	5	0	2	5	4
8:00	4	7	8	6	5	5	5	6	6
9:00	2	3	3	2	6	3	5	3	3
10:00	2	10	5	1	7	5	13	5	6
11:00	8	7	1	0	10	10	27	5	9
12:00	4	3	3	4	3	30	21	3	10
13:00	6	6	9	8	11	10	13	8	9
14:00	3	14	3	7	8	8	10	7	8
15:00	11	7	8	12	6	8	12	9	9
16:00	4	4	9	10	15	23	11	8	11
17:00	1	7	0	8	2	6	11	4	5
18:00	1	1	3	2	3	1	8	2	3
19:00	0	1	1	0	1	0	0	1	0
20:00	0	0	0	0	0	0	0	0	0
21:00	3	0	0	0	0	0	3	1	1
22:00	1	0	0	0	0	0	0	0	0
23:00	0	0	0	0	8	0	0	2	1
Total	58	79	62	77	101	118	144	75	91

7-19	47	74	56	69	81	109	138	65	82
6-22	50	75	57	69	84	109	141	67	84
6-24	51	75	57	69	92	109	141	69	85
0-24	58	79	62	77	101	118	144	75	91

Road	Glowworm Tunnel Rd (north of Old Bells Line)	M'Cycle & P'Cycle	4%
Location	Lithgow	Cars	64%
Site No.	2	LGV	28%
Start Date	15-Jul-11	OGV1 & PSV	2%
Day	7 Day Ave.	OGV2	2%
Description	Class Summary		

	NB						SB						Combined					
	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	1	1	0	0	2	0	0	0	0	0	0	0	1	1	0	0	2
4:00	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	2
5:00	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	3	0	0	4	0	0	0	0	0	0	0	0	3	0	0	4
8:00	0	1	4	0	0	5	0	1	0	0	0	1	0	2	4	0	0	6
9:00	0	0	2	0	0	3	0	1	0	0	0	1	0	1	2	0	0	3
10:00	0	2	3	0	0	5	0	1	0	0	0	1	0	3	3	0	0	6
11:00	0	3	2	0	0	5	0	3	0	0	0	4	0	6	2	0	0	9
12:00	1	2	3	0	0	6	0	3	0	0	0	4	1	6	3	0	0	10
13:00	0	1	2	0	0	3	0	5	0	0	0	6	1	6	2	0	0	9
14:00	0	1	1	0	0	3	0	5	0	0	0	5	0	6	1	0	0	8
15:00	0	1	1	0	0	2	0	6	0	0	0	7	0	7	1	0	0	9
16:00	0	3	0	0	0	4	1	6	0	0	0	7	1	9	0	0	0	11
17:00	0	0	1	0	0	1	0	4	0	0	0	4	0	4	1	0	0	5
18:00	0	1	0	0	0	1	0	2	0	0	0	2	0	3	0	0	0	3
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	1
Total	2	16	25	1	2	46	2	42	0	0	0	45	4	58	26	2	2	91

Combined Directions



Job No	N649
Client	ARC
Road	Sunnyside Ridge Rd
Location	Lithgow
Site No.	1
Start Date	15-Jul-11
Description	Volume Summary
Direction	Combined

Average Weekday	32
7 Day Average	39

Time	Day of Week							Ave W'day	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	18-Jul	19-Jul	20-Jul	21-Jul	15-Jul	16-Jul	17-Jul		
AM Peak	7	7	7	6	4	3	19		
PM Peak	5	4	6	7	3	16	12		
0:00	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0
7:00	0	3	3	2	1	1	0	2	1
8:00	1	4	2	6	3	3	0	3	3
9:00	7	3	7	1	1	1	1	4	3
10:00	3	3	4	2	2	0	19	3	5
11:00	1	7	1	1	4	3	16	3	5
12:00	4	2	4	1	3	2	0	3	2
13:00	2	1	5	6	0	1	12	3	4
14:00	1	3	3	7	1	12	8	3	5
15:00	1	4	6	6	1	1	9	4	4
16:00	5	1	4	1	1	16	4	2	5
17:00	0	2	0	2	0	2	3	1	1
18:00	0	0	3	3	0	0	0	1	1
19:00	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	3	0	0	1	0
21:00	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
Total	25	33	42	38	20	42	72	32	39

7-19	25	33	42	38	17	42	72	31	38
6-22	25	33	42	38	20	42	72	32	39
6-24	25	33	42	38	20	42	72	32	39
0-24	25	33	42	38	20	42	72	32	39

Road Sunnyside Ridge Rd

Location Lithgow

Site No. 1

Start Date 15-Jul-11

Day 7 Day Ave.

Description Class Summary

M'Cycle & P'Cycle 15%

Cars 64%

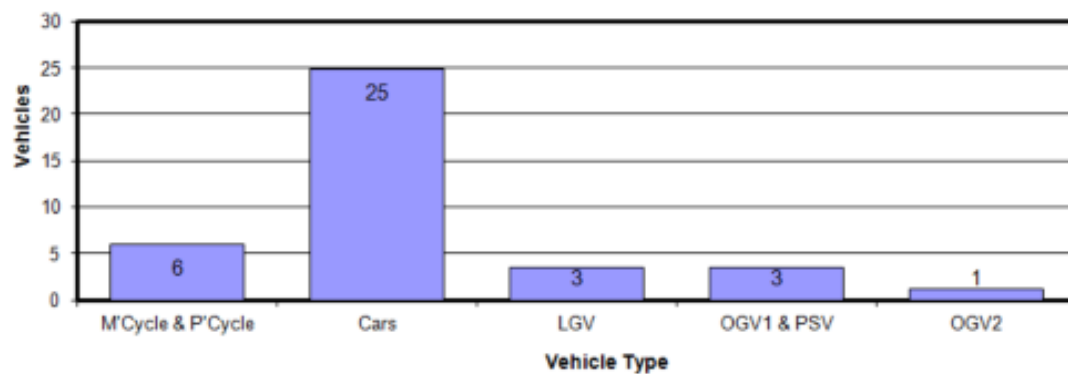
LGV 9%

OGV1 & PSV 9%

OGV2 3%

	NB						SB						Combined					
	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total	M'Cycle & P'Cycle	Cars	LGV	OGV1 & PSV	OGV2	Total
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	1	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1
8:00	0	2	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	3
9:00	0	1	0	0	0	2	0	1	0	0	0	1	0	2	0	0	0	3
10:00	2	1	0	0	0	3	1	1	0	0	0	2	2	1	0	1	0	5
11:00	0	2	0	0	0	2	2	1	0	0	0	3	2	3	0	0	0	5
12:00	0	1	0	0	0	2	0	0	0	0	0	1	0	1	1	0	0	2
13:00	0	1	0	0	0	2	0	2	0	0	0	2	0	3	0	0	0	4
14:00	0	1	0	0	0	3	0	2	0	0	0	2	1	3	0	1	0	5
15:00	0	1	0	0	0	1	0	2	0	0	0	3	0	3	0	1	0	4
16:00	0	0	0	0	0	1	0	4	0	0	0	4	0	4	0	0	0	5
17:00	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	1
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	11	3	2	0	19	3	14	1	1	1	20	6	25	3	3	1	39

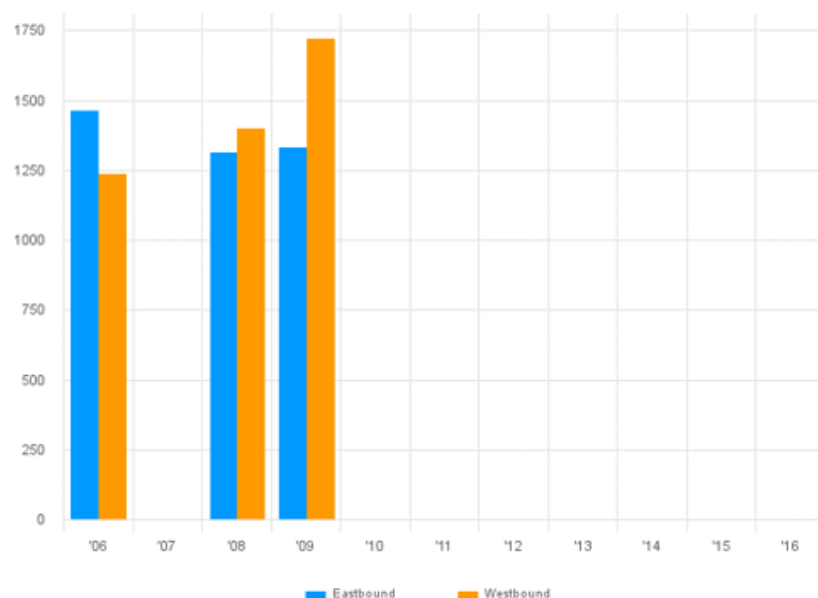
Combined Directions



Station ID 99037

YEAR DIRECTION	VEHICLE TYPE	TOTAL	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
2006 Westbound	Light Vehicles	1225	9	5	6	4	4	7	8	29	41	56	103	120	111	137	131	99	98	77	58	35	29	27	21	10
2006 Westbound	Heavy Vehicles	30			1		1		1	1	1	3		1	2	4	2	2	4		1	1		1	2	2
2006 Westbound	All Vehicles	1241	9	5	4	4	4	4	9	30	42	58	103	121	112	139	133	101	102	77	58	36	29	28	22	11
2006 Eastbound	Light Vehicles	1432	2	3	3	1	4	7	15	27	43	71	101	112	143	135	168	138	133	117	74	56	39	19	12	9
2006 Eastbound	Heavy Vehicles	43			2		1		2	1	2	2	1	3	3	4	3	4	3	3	3	2	1	1	1	1
2006 Eastbound	All Vehicles	1466	2	3	5	1	5	7	16	28	45	73	101	114	145	137	171	142	136	119	77	58	40	19	13	9
2008 Westbound	All Vehicles	1277	6	4	4	6	11	24	45	58	75	82	95	96	98	96	107	108	104	89	59	41	27	19	14	9
2008 Eastbound	All Vehicles	1325	6	4	4	5	10	19	34	50	62	75	87	96	107	112	131	140	132	100	60	37	23	15	9	7
2009 Westbound	All Vehicles	1142	6	4	4	6	10	26	44	55	72	73	83	86	85	81	83	82	78	76	59	45	32	23	19	10
2009 Eastbound	All Vehicles	1375	6	4	4	6	9	16	30	48	61	75	85	95	106	115	134	141	140	108	78	47	29	19	11	8

Chifley Road



Exported on Tue Jun 21 2016 at 9:50:7. © Roads and Maritime Services 2015.

	2006	2007	2008	2009
→ E	1,466 2.39%	-	1,316 -	1,335 -
← W	1,238 1.86%	-	1,401 -	1,724 -
→ E	2,704 2.14%	-	2,717 -	3,059 -
← W				

Appendix B – Crash Data

Road Users by LGA: Lithgow

(Casualty Severity = All,
Reporting Year of Crash = All)

Select Local Government Area
Lithgow

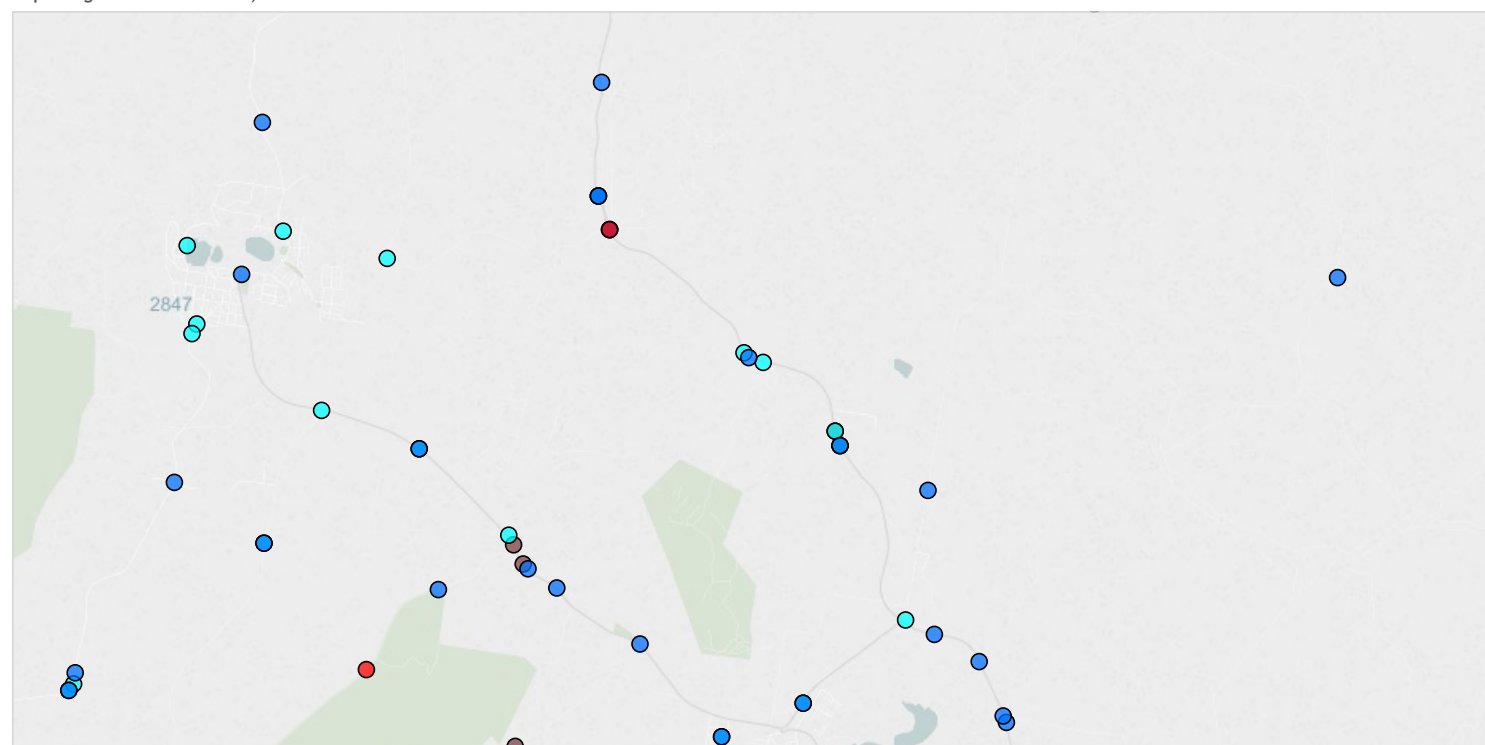
Select Casualty Severity

(see Help for definitions)

- ☒ Killed
- ☒ Serious injury matched to a police report
- ☒ Moderate injury matched to a police report
- ☒ Minor / Other injury

Select Reporting Year

All



- Killed
- Serious injury matched to a police report
- Moderate injury matched to a police report
- Minor / Other injury

A single dot on the map may represent multiple persons sharing the same crash location, whereas the table below shows the entire number of persons and crashes.

Excludes Lord Howe Island crashes.

Excludes crashes involving no people (e.g a run-away vehicle into a parked vehicle)

Casualties	2009	2010	2011	2012	2013
Killed	1	2	5	2	3
Serious injuries matched to police reports	53	42	56	38	44
Moderate injuries matched to police reports	61	53	66	58	60
Minor / Other Injury	16	35	52	20	18
Crashes	2009	2010	2011	2012	2013
Fatal	1	2	5	2	3
Serious injury crashes matched to police reports	40	34	48	32	36
Moderate injury crashes matched to police reports	37	44	44	41	47
Minor / Other	11	16	23	11	8

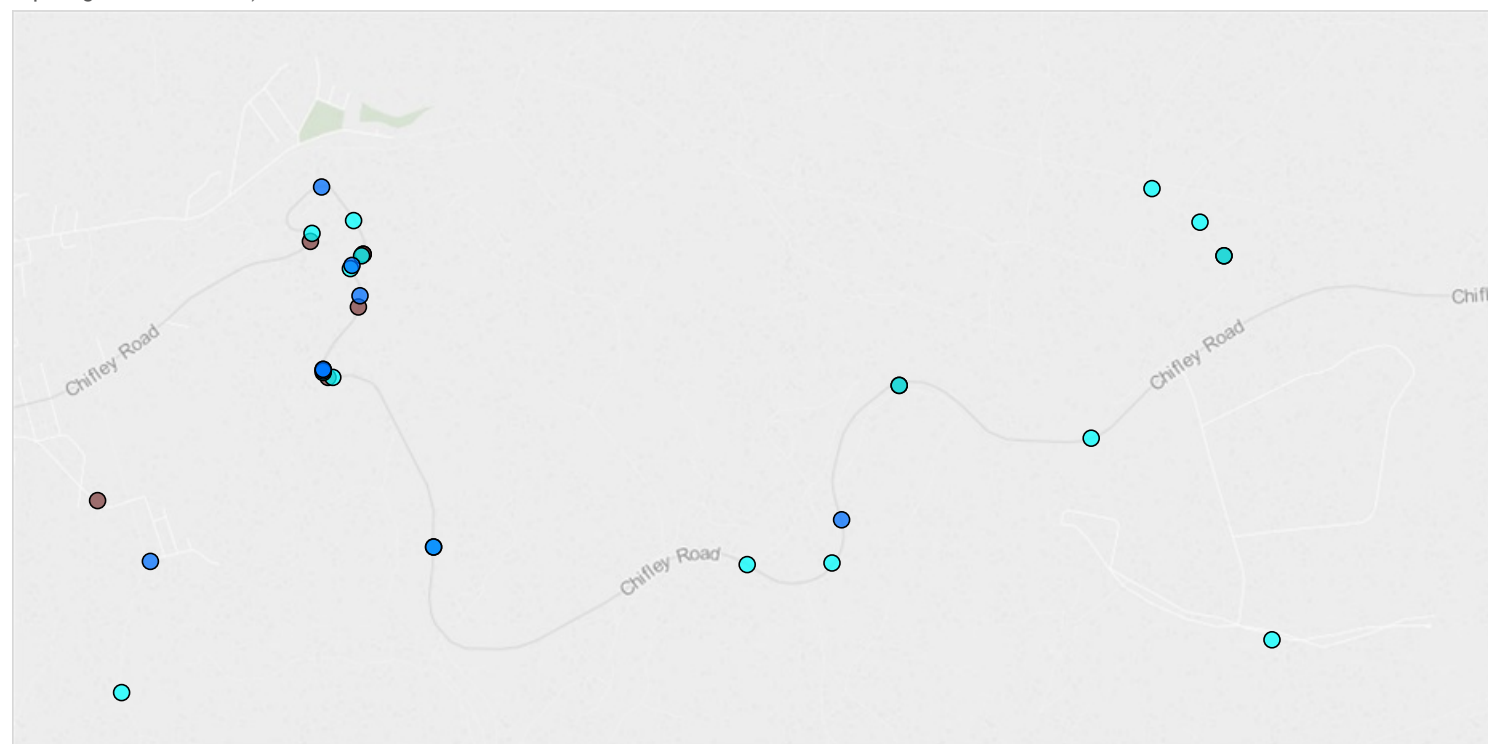


Help

Last published date: 21 September 2015

Road Users by LGA: Lithgow

(Casualty Severity = All,
Reporting Year of Crash = All)



Select Local Government Area

Lithgow

Select Casualty Severity

(see Help for definitions)

- ☒ Killed
- ☒ Serious injury matched to a police report
- ☒ Moderate injury matched to a police report
- ☒ Minor / Other injury

Select Reporting Year

All

- Killed
- Serious injury matched to a police report
- Moderate injury matched to a police report
- Minor / Other injury

A single dot on the map may represent multiple persons sharing the same crash location, whereas the table below shows the entire number of persons and crashes.

Excludes Lord Howe Island crashes.

Excludes crashes involving no people (e.g a runaway vehicle into a parked vehicle)

Casualties	2009	2010	2011	2012	2013
Killed	1	2	5	2	3
Serious injuries matched to police reports	53	42	56	38	44
Moderate injuries matched to police reports	61	53	66	58	60
Minor / Other Injury	16	35	52	20	18
Crashes	2009	2010	2011	2012	2013
Fatal	1	2	5	2	3
Serious injury crashes matched to police reports	40	34	48	32	36
Moderate injury crashes matched to police reports	37	44	44	41	47
Minor / Other	11	16	23	11	8



Help

Last published date: 21 September 2015

Appendix C – Bus Routes

LITTLETON & LITHGOW HOSPITAL via Strathlone Estate & Kirkley Gardens										ROUTE 100		
	Monday to Friday									Saturday		
	am	am	am	am	pm	pm	pm	pm	pm	am	am	pm
<i>Train Arrives from Sydney</i>	-	9.08	-	(11:05)	-	(1:05)	(3:05)	5.05	(5:05)	8.42	-	(11:10)
Court House Hotel- Main Street	-	9.20	10.45	11.50	12.45	2.20	4.30	5.15	5.50	8.45	10.02	12.20
Lithgow Railway - opp in Main St at Post Office	-	9.21	10.46	11.51	12.46	2.21	4.31	5.16	5.51	8.46	10.03	12.21
Library- Main Street	-	9.22	10.47	11.52	12.47	2.22	4.32	5.17	5.52	8.47	10.04	12.22
Lithgow Valley Plaza - Bus Shed inside Car Park	-	9.25	10.50	11.55	12.50	2.25	4.35	5.20	5.55	8.50	10.07	12.25
Small Arms Factory - Methven Street	-	9.30	10.55	12.00	12.55	2.30	4.40	5.25	6.00	8.55	10.12	12.30
Rabaul/Lemnos Streets	-	9.33	10.58	12.03	12.58	2.33	4.43	5.28	6.03	8.58	10.15	12.33
Gt Western Hwy/Robinia Drive	6.58	9.35	11.00	12.05	1.00	2.35	4.45	5.30	6.05	9.00	10.17	12.35
Strathlone Estate Loop	6.58	9.35	-	12.05	-	2.35	On Req	On Req	On Req	9.00	10.17	12.35
Kirkley Gardens - Main Entry Kirkley Street	7.01	9.37	11.02	12.08	1.02	2.38	4.47	5.32	6.07	9.03	10.20	12.38
Lithgow Hospital	7.04	9.40	11.05	12.11	1.05	2.41	4.50	5.35	6.10	9.06	10.23	12.41
Treeview Estate	7.05	9.41	11.06	12.12	1.06	2.42	4.51	On Req	On Req	9.07	10.24	12.42
Lemnos/Rabaul Streets	7.07	9.43	11.08	12.14	1.08	2.44	4.53	5.37	6.12	9.09	10.26	12.44
Small Arms Factory - opp in Methven Street	7.10	9.46	11.11	12.17	1.11	2.47	4.56	5.40	6.15	9.12	10.29	12.47
Lithgow Valley Plaza - Bus Shed inside Car Park	7.14	9.51	11.16	12.22	1.16	2.52	5.01	5.43	6.19	9.16	10.34	12.52
Opp Library - Main Street	7.18	9.56	11.21	12.27	1.19	2.55	5.05	5.46	6.22	9.19	10.39	12.55
Lithgow Railway - Main Street at Arcade	7.19	9.57	11.22	12.28	1.20	2.56	5.06	5.47	6.23	9.20	10.40	12.56
Opp Court House Hotel - Main Street	7.20	9.58	11.23	12.29	1.21	2.57	5.07	5.48	6.24	9.21	10.41	12.57
<i>Train to Sydney - Departs</i>	7.26	(11:26)	11.26	(1:26)	1.26	(3:26)	(5:34)	-	(7:35)	9.37	(11:37)	(1:37)

BOWENFELS via Coerwull & Lithgow Hospital													ROUTE 200			
	Monday to Friday												Saturday			
	am 	am	am 	am 	am 	pm 	pm 	pm 	pm 	pm 	pm 	pm 	am 	am 	am 	pm 
<i>Train Arrives from Sydney</i>	-	7.08	-	(9:08)	-	(11:05)	1.05	(1:05)	-	(3:05)	5.05	(5:05)	-	8.43	11.10	1.10
Court House Hotel - Main Street	-	7.22	8.55	10.00	11.00	12.05	1.15	1.45	2.28	4.10	5.10	5.50	-	9.20	11.37	1.40
Lithgow Railway - opp in Main St at Post Office	-	7.23	8.56	10.01	11.01	12.06	1.16	1.46	2.29	4.11	5.11	5.51	-	9.21	11.38	1.41
Library- Main Street	-	7.24	8.57	10.02	11.02	12.07	1.17	1.47	2.30	4.12	5.12	5.52	-	9.22	11.39	1.42
Lithgow Valley Plaza - Bus Shed inside Car Park	-	-	9.00	10.05	11.05	12.10	1.20	1.50	2.33	4.15	5.15	5.55	-	9.25	11.42	1.45
Bunnings - Main Street	-	7.25	9.06	10.11	11.11	12.16	1.26	1.56	2.39	4.21	5.21	6.00	-	9.31	11.48	1.51
Musket Parade/Main Street	-	7.26	9.07	10.12	11.12	12.17	1.27	1.57	2.40	4.22	5.22	6.01	8.10	9.32	11.49	1.52
Gt Western Hwy/Tweed Street	7.00	7.30	9.11	10.16	11.16	12.21	1.31	2.01	2.44	4.26	5.26	6.05	8.14	9.36	11.53	1.56
Landa/Tweed Streets	7.04	7.34	9.15	10.20	11.20	12.25	1.35	2.05	2.48	4.30	5.30	6.09	8.18	9.40	11.57	2.00
Caroline Street/Gt Western Hwy	7.09	7.39	9.20	10.25	11.25	12.30	1.40	2.10	2.53	4.35	5.35	6.13	8.23	9.45	12.02	2.05
Lithgow Hospital	7.13	-	9.24	10.29	11.29	12.34	1.44	2.14	-	4.39	5.39	-	8.27	9.49	12.06	2.09
Gt Western Hwy/Main Street- McDonalds	7.16	7.39	9.27	10.32	11.32	12.37	1.47	2.17	2.54	4.42	5.42	6.13	8.30	9.52	12.09	2.12
Lithgow Valley Plaza - Bus Shed inside Car Park	-	-	9.31	10.36	11.36	12.41	1.51	2.21	2.58	4.46	5.46	On Req	8.34	9.56	12.13	2.16
Opp Library- Main Street	7.20	7.41	9.34	10.41	11.40	12.46	1.55	2.26	3.01	4.50	5.50	6.15	8.39	10.00	12.18	2.21
Lithgow Railway - Main Street at Arcade	7.21	7.42	9.35	10.42	11.41	12.47	1.56	2.27	3.02	4.51	5.51	6.16	8.40	10.01	12.19	2.22
Opp Court House Hotel - Main Street	7.22	7.43	9.36	10.43	11.42	12.48	1.57	2.28	3.03	4.52	5.52	6.17	8.41	10.02	12.20	2.23
<i>Train to Sydney- Departs</i>	7.26	-	-	11.26	-	1.26	-	(3:28)	3.26	(5:34)	-	(7:35)	(9:37)	(11:37)	(1:37)	(3:37)

LEGEND

#

Operates via Ramsay - Redgate & Berry Streets

On Req:

On request

Routes so marked will generally be serviced by a fully wheelchair accessible bus.

Periodic maintenance may affect availability, please check prior to journey.

School day diversion

SH

Operates school holidays

Effective from 10 December 2014

Route 100

Route 200

Route 304

Route 500

Route 600

Route 636

Littleton & Lithgow Hospital

Bowenfels

McKellars Park & Oakey Park

Vale of Clwydd

Portland to Lithgow

Bathurst to Lithgow

Office Hours: 8:30am - 5pm weekdays

24 Donald Street

PO Box 319 Lithgow NSW 2790

Tel: (02) 6352 3888 Fax: (02) 6351 3206

www.lithgowbuslines.com.au

info@lithgowbuslines.com.au

McKELLARS PARK & OAKEY PARK via Hermitage Flat & Morts Estate Hermitage										ROUTE 304		
	Monday to Friday							Saturday				
	am	am	am	pm	pm	pm	pm	am	am	pm		
<i>Train Arrives from Sydney</i>	-	-	11.05	-	1.05	(3:05)	5:05	-	-	(11:10)		
Opp Court House Hotel- Main Street	-	8.57	11.24	12.48	1.21	4.20	5.52	8.00	10.41	12.45		
Lithgow Railway - outside in Railway Parade	-	8.58	11.25	12.49	1.22	4.21	5.53	8.01	10.42	12.46		
Albert/Coalbrook Streets	6.57	9.02	11.29	12.53	1.26	4.25	5.57	8.05	10.46	12.50		
Sandford Avenue/Crane Road	7.00	9.05	11.32	12.56	1.29	4.28	6.00	8.08	10.49	12.53		
Macauley/Laidley Streets	7.02	9.07	11.34	12.58	1.31	4.30	6.02	8.10	10.51	12.55		
Macauley/Mount Street turnaround	-	9.09	11.36	-	1.33	4.32	On Req	8.12	10.53	On Req		
Macauley/Laidley Streets	7.02	9.10	11.37	12.58	1.34	4.33	6.02	8.13	10.54	12.55		
Bells Road turnaround at bus shed	7.07	9.15	11.42	1.03	1.39	4.38	6.07	8.18	10.59	1.00		
Inch/Bennett Streets	7.09	9.17	11.44	1.05	1.41	4.40	6.09	8.20	11.01	1.02		
Opposite Bus Depot - Donald Street	7.10	9.18	11.45	1.06	1.42	4.41	6.10	8.21	11.02	1.03		
Lithgow Workers Club- Tank Street	7.10	9.19	11.46	1.07	1.43	4.42	On Req	8.22	11.03	1.04		
Court House Hotel - Main Street	7.11	9.20	11.47	1.08	1.44	4.43	On Req	8.23	11.04	1.05		
Lithgow Railway- opp in Main St at Post Office	7.12	9.21	11.51	1.09	1.45	4.44	On Req	8.24	11.05	1.06		
Library- Main Street	7.13	9.22	11.52	1.10	1.46	4.45	On Req	8.25	11.06	1.07		
Lithgow Valley Plaza - Bus Shed inside Car Park	-	9.25	11.55	1.13	1.49	4.48	On Req	8.28	11.09	1.10		
<i>Train to Sydney- Departs</i>	7.26	9.26	-	1.26	-	(5:34)	-	8:33	11.37	1.37		

VALE of CLWYDD via Hill Street										ROUTE 500		
	Monday to Friday						Saturday					
	am	am	am	pm	pm	pm	am	am	pm			
<i>Train Arrives from Sydney</i>	-	9:08	11.05	1.05	(3:05)	5.05	-	11.10	1.10			
Lithgow Valley Plaza- Bus Shed inside Car Park	-	9.31	11.36	1.51	4.46	5.20	8.25	11.09	1.10			
Opp Library- Main Street	-	9.34	11.40	1.55	4.50	5.24	8.29	11.13	1.14			
Lithgow Railway- Main Street at Arcade	-	9.35	11.41	1.56	4.51	5.25	8.30	11.14	1.15			
Opp Court House Hotel- Main Street	-	9.36	11.42	1.57	4.52	5.26	8.31	11.15	1.16			
Chifley Road/Hartley Valley Road	7.05	9.41	11.47	2.02	4.57	5.31	8.36	11.19	1.21			
Hartley Valley Road/Mort Street	7.06#	9.42#	11.48	2.03#	4.58	5.32#	8.37#	11.20#	1.22#			
Johnson/Whitton Streets	7.09	9.45	11.51	2.06	5.01	5.35	8.40	11.23	1.25			
Cooinda Homes	7.12	9.48	11.54	2.09	5.04	5.38	8.43	11.25	1.28			
Lithgow Valley Plaza- Bus Shed inside Car Park	-	9.52	11.58	2.13	5.08	5.42	8.47	11.28	1.32			
Opp Library- Main Street	7.17	9.56	12.02	2.17	5.12	5.46	8.51	11.31	1.36			
Lithgow Railway- Main Street at Arcade	7.18	9.57	12.03	2.18	5.13	5.47	8.52	11.32	1.37			
Opp Court House Hotel- Main Street	7.19	9.58	12.04	2.19	5.14	5.48	8.53	11.33	1.38			
<i>Train to Sydney- Departs</i>	7.26	-	(1:26)	(3:26)	5:34	-	(9:37)	11.37	(1:37)			

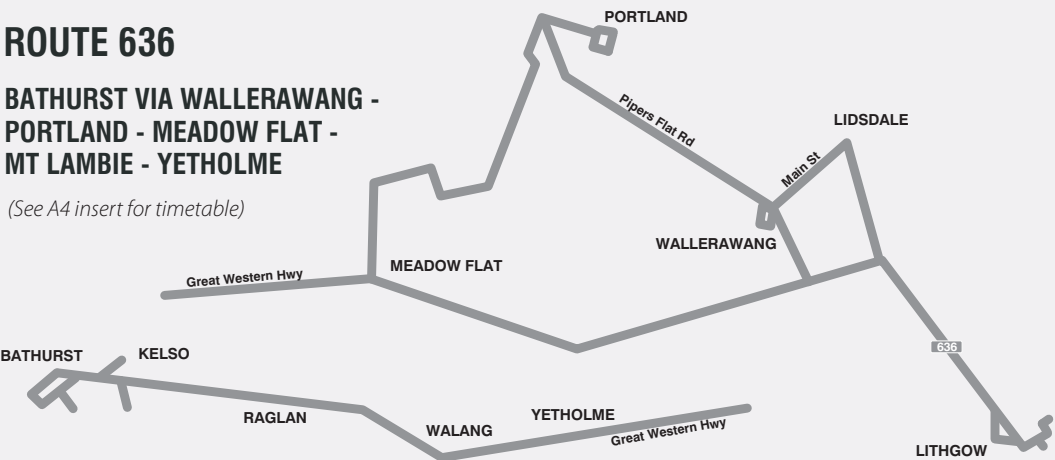
PORTLAND - LITHGOW via Wallerawang & Return														ROUTE 600	
	Monday to Friday												Saturday		
	am	am	am	am	am	pm	pm	pm	pm	pm	pm	pm	am	pm	
			SH												
<i>Train Arrives Lithgow Railway from Sydney</i>	-	7.08	7.08	-	-	11.05	-	1.05	-	-	-	5.05	8.42	-	
Lithgow Workers Club- Tank Street	-	-	-	-	-	11.19	-	1.34	2.50	-	-	5.33	8.55	-	
Court House Hotel- Main Street	-	7.43	7.25	-	-	11.20	-	1.35	2.51	-	-	5.35	8.56	-	
Lithgow Railway- opp in Main St at Post Office	-	7.44	7.26	-	-	11.21	-	1.36	2.51	-	-	5.36	8.57	-	
Library- Main Street	-	7.45	7.27	-	-	11.22	-	1.37	2.52	-	-	5.37	8.58	-	
Lithgow Valley Plaza- Bus Shed inside Car Park	-	-	-	-	-	11.26	-	1.40	-	-	-	5.40	9.01	-	
Gt Western Hwy/Main Street- opp McDonalds	-	7.48	7.30	-	-	11.29	-	1.43	2.54	-	-	5.43	9.06	-	
Lithgow Caravan Park- Coerwull Road	-	7.50	7.32	-	-	11.31	-	1.45	-	-	-	5.45	9.08	-	
Marrangaroo Fields- Gt Western Hwy	-	7.53	7.35	-	-	11.34	-								

CITY OF LITHGOW

ROUTE 636

BATHURST VIA WALLERAWANG -
PORTLAND - MEADOW FLAT -
MT LAMBIE - YETHOLME

(See A4 insert for timetable)



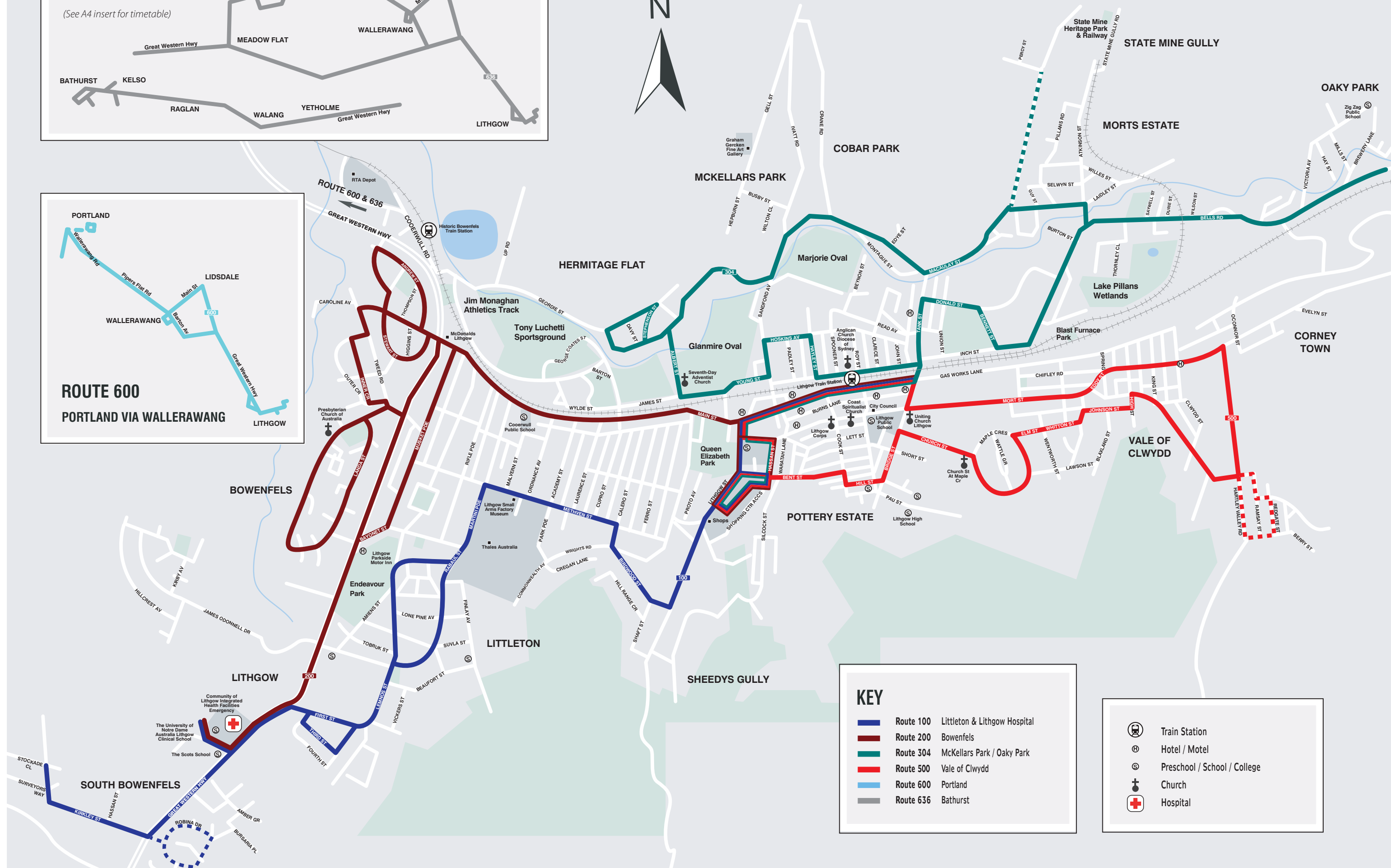
ROUTE 600

PORTLAND VIA WALLERAWANG



ROUTE 600

PORTLAND VIA WALLERAWANG



KEY

- Route 100 Littleton & Lithgow Hospital
- Route 200 Bowenfels
- Route 304 McKellars Park / Oaky Park
- Route 500 Vale of Clwydd
- Route 600 Portland
- Route 636 Bathurst

- Train Station
- Hotel / Motel
- Preschool / School / College
- Church
- Hospital

BATHURST to LITHGOW via Yetholme- Mt Lambie- Meadow Flat- Portland- Wallerawang						ROUTE 636
	Monday to Friday			Saturday		
	am 	pm 	pm	am Trainlink coach	pm Lithgow Buslines Service	pm Trainlink coach
Bathurst Railway Station- Keppel Street	8.58	3.25	4.55	10.05	11.18	12.05
Bathurst Bus Terminal- Acropole Café Howick St	9.02	3.22	5.02	-	11.20	-
Kelso- Gt Western Hwy	9.07	3.40	5.08	-	11.25	-
Raglan- Gt Westen Hwy- Countrylink Stop	9.12	4.02	5.17	-	11.30	-
Yetholme- Gt Western Hwy	9.21	4.12	5.33	-	11.39	-
Meadow Flat opposite school Sunny Corner Road	9.28	4.19	5.39	-	11.46	-
Mt Lambie- Gt Western Hwy- Countrylink Stop	-	-	-	-	-	-
Portland Post Office	9.42	-	-	-	12.01	-
East Portland	9.45	-	-	-	12.05	-
Portland RSL Club	9.50	4.35	5.53	-	12.09	-
Wallerawang Black Bridge	10.00	4.40	6.01	-	12.19	-
Wallerawang- Main Street	10.05	-	-	-	-	-
Wallerawang- Hume Ave loop	10.01	-	-	-	12.21	-
Blackman's Flat- Castlereagh Hwy/View Street	-	-	-	-	-	-
Wallerawang turnoff- Barton Ave/Gt Western Hwy	-	4.45	6.03	-	12.25	-
Lidsdale- Bells Corner	-	-	-	-	-	-
Castlereagh Hwy/Wolgan Road	10.08	-	-	-	-	-
Lithgow Correctional Ctre- Gt Western Hwy	10.12	4.47	6.05	-	12.27	-
Marrangaroo Fields- Girraween Road	10.15	On Request	On Request	-	On Request	-
Lithgow Caravan Park- Cooerwull Road	10.19	4.52	6.10	-	12.31	-
Gt Western Hwy/Main Street- McDonalds	10.22	4.55	6.15	-	12.34	-
Lithgow Valley Plaza- Bus Shed inside Car Park	10.26	On Request	On Request	-	On Request	-
Opposite Library- Main Street	10.29	4.58	6.18	-	12.37	-
Lithgow Railway- Arcade in Main St opp Post Office	10.30	4.59	6.19	11.05	12.38	1.05
Opposite Court House Hotel- Main Street	10.31	5.00	6.20	-	12.39	-
Lithgow Workers Club- Tank Street	10.32	5.01	6.21	-	On Request	-
Train Departs Lithgow Railway to Sydney	(11:26)	5.34	(7:34)	11.37	-	1.26

LITHGOW to BATHURST via Wallerawang- Portland- Meadow Flat- Mt Lambie- Yetholme						ROUTE 636
	Monday to Friday			Saturday		
	am 	pm 	pm	am Lithgow Buslines Service	pm Trainlink coach	
Train Arrives Lithgow Railway from Sydney	7.08	1.05	3.05	8.42	3.30	
Lithgow Workers Club- Tank Street	7.10	1.34	-	8.55	-	
Court House Hotel- Main Street	7.11	1.35	3.43	8.56	-	
Lithgow Railway- opp in Main St at Post Office	7.12	1.36	3.45	8.57	3.30*	
Library- Main Street	7.13	1.37	3.46	8.58	-	
Lithgow Valley Plaza- Bus Shed inside Car Park	-	1.40	3.48	9.01	-	
Gt Western Hwy/Main Street- opp McDonalds	7.16	1.43	4.00^	9.06	-	
Lithgow Caravan Park- Cooerwull Road	7.18	1.45	-	9.08	-	
Marrangaroo Fields- Gt Western Hwy	7.20	1.48	4.03	9.11	-	
Opp Lithgow Correctional Ctre- Gt Western Hwy	7.22	1.50	4.05	9.13	-	
Castlereagh Hwy/Wolgan Road	-	1.55	-	9.17	-	
Lidsdale- Bells Corner	-	-	-	-	-	
Blackman's Flat- Castlereagh Hwy/View Street	-	-	-	-	-	
Wallerawang turnoff- Barton Ave/Gt Western Hwy	7.26	-	4.08	-	-	
Wallerawang- Hume Ave loop	-	2.03	-	9.22	-	
Wallerawang Bridge	7.28	2.00	4.14	9.24	-	
Wallerawang- Main Street	-	1.59	-	9.20	-	
Portland RSL Club	7.40	2.13	-	9.42	-	
East Portland	-	2.17	-	9.38	-	
Portland Post Office	-	-	-	-	-	
Mt Lambie- Gt Western Hwy- Countrylink Stop	-	-	4.25	-	-	
Meadow Flat opposite school Sunny Corner Road	7.55	2.40	4.31^^	9.52	-	
Yetholme- Gt Western Hwy	8.02	2.45	4.38	9.57	-	
Raglan- Gt Westen Hwy- Countrylink Stop	8.07	2.56	4.48	10.02	-	
Kelso- Gt Western Hwy	8.28	2.59	4.51	10.05	-	
Bathurst Railway Station- Keppel Street	On Request	3.05	4.55	10.08	4.25	
Bathurst Bus Terminal- Acropole Café Howick St	8.45 On Request	3.00	5.00	10.10	-	

*	NSW Trainlink Coach Service from Railway Ave- times correct at time of print please check with TrainLink to ensure still current		Routes so marked will generally be serviced by a fully wheelchair accessible bus. Periodic maintenance may affect availability, please check prior to journey.
	Services operated by Trainlink - please check for changes in times	^	Pick up on Gt Western Hwy opposite McDonalds
	Operates school days only	^^	Picks up on Gt Western Hwy opp Meadow Flat School

GHD

133 Castlereagh St Sydney NSW 2000

-

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Rev 0	M Tran	O Peel	On file	K Rosen	On file	18/08/2016

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