

# MOOLARBEN COAL PROJECT

*Stage 2*

## *A P P E N D I X 12*

### *Traffic Impact Assessment*



## Moolarben Coal Project Stage 2



### TRAFFIC IMPACT ASSESSMENT

- Final
- November 2008



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# 1. Introduction

## 1.1. Background

This report presents an assessment of the traffic and transport implications of the proposed Moolarben Coal Project Stage 2, which is located north of Mudgee near the village of Ulan.

The proposed Stage 2 of the Moolarben Coal Project (MCP) will comprise of one open cut and two underground mines and associated mine infrastructure and services. Stage 2 will operate concurrently with Stage 1 to constitute the Moolarben Coal Project (MCP) which will operate as a single mining complex comprising three underground and four open cut coal mines with surface facilities comprising coal handling, preparation, ROM and clean coal stock piling and rail loading together with administrative, workshops and bathhouse facilities.

## 1.2. Document Outline

This document is structured as follows:

- **Section 2** describes the existing road situation in the local area;
- **Section 3** details the proposed development in terms of traffic generating activities;
- **Section 4** assesses the impact of the proposed development on the local road network;
- **Section 5** outlines how construction traffic would be managed; and
- **Section 6** summarises the findings of the study; and
- **Section 7** provides list of documents referred to in this study.



## 2. Existing Situation

### 2.1. Site Location

The Moolarben Coal Mine site is located near the town of Ulan in the western coalfields of NSW. It is within 40km of the towns of Gulgong and Mudgee, almost 200km north-west of Sydney and about the same distance west of Newcastle. **Figure 2-1** shows the regional context of the site location.

### 2.2. Local Road Network

The Moolarben Coal Mine is located near the intersection of two designated main roads: Main Road (MR) 214, which connects Mudgee with Cassillis, and MR598 which links Gulgong and Ulan. These roads, along with other Main Roads in the area, are under the care and control of the Mid-Western Regional Council with funding assistance provided by the NSW Roads and Traffic Authority. MR214 connects with MR208 (linking Mudgee and Sandy Hollow) just north of Mudgee. The mine site straddles the Ulan-Wollar Road where it meets with MR214.

The main inter-regional road links are provided by two State Highways. The Castlereagh Highway (SH18) connects the Great Western Highway near Lithgow with Queensland via Gilgandra, Coonamble and Walgett. The Golden Highway (SH27) links the New England Highway near Singleton with Dubbo and the Newell and Mitchell Highways. State Highways are the responsibility of the NSW RTA. The local road network is shown in **Figure 2-2**.

The Castlereagh Highway (SH18) is predominantly a 2-lane road, with sealed shoulders and occasional auxiliary lanes provided for overtaking. The speed limit is generally 100km/hour, with lower speed limits in place in built up areas. Between Mudgee and Gulgong, the 2005 Annual Average Daily Traffic volume (AADT)<sup>1</sup> was around 3,000 axle pairs<sup>2</sup>. Growth since 1980 has been at around 1.8% per year.

MR214 (Mudgee-Ulan and Ulan-Cassilis) is a 2-lane road with a speed limit of 100km/hour. There are some sections of the road with sealed 1m-wide shoulders, but for much of its length there is either no shoulder or a shoulder of rough gravel. Council has plans to progressively upgrade the road from Mudgee to Ulan to have a 8m seal on a 10m formation, with shoulders provided throughout. Between Mudgee and Ulan, the 2005 AADT<sup>3</sup> was approximately 1,300 axle pairs,

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<sup>1</sup> RTA Count Station 99.165

<sup>2</sup> A passenger car is the equivalent of 1 axle pair. A 3-axle truck is 1.5 axle pairs.

<sup>3</sup> RTA Count Station 99.221



although north of Ulan this drops to about 600 axle pairs per day. Growth in traffic is around 2.3% per year.

MR598 (Gulgong-Ulan) is of similar standard to MR214 and is also being progressively upgraded by Council. The 2005 AADT<sup>4</sup> at the level crossing east of Gulgong was approximately 1,600 axle pairs, but this volume halves further east of the town. Growth in traffic is around 1.9% per year.

The Ulan-Wollar Road roughly follows the Gulgong to Sandy Hollow railway between MR214 at Ulan and MR208 at Wollar. East of MR214, it is sealed for only the first 4km. No traffic volume data is available for this road, but observation indicates that it is only lightly trafficked.

### **2.3. Road Safety**

Data was obtained from the RTA about the recent road crash history of MR214 (south of Ulan) and MR598 (excluding the Gulgong urban area). In the 5 years from September 2003 to August 2008, there were 32 crashes recorded on MR214, including 2 fatal crashes and 19 injury crashes. The most common types of crashes were where the vehicle left the carriageway, accounting for 49% of all crashes. On MR598 over the same time, there were 10 crashes recorded, including 7 injury crashes and no fatalities. Nine of the 10 crashes involved the vehicles leaving the carriageway.

A crash rate, where the number of crashes is compared to the volume of passing traffic, has been calculated at approximately 41 crashes per 100 Million Vehicle Kilometres Travelled (MVKT) for MR214 and 28 crashes per 100 MVKT for MR598. These are both below the NSW state average crash rate of approximately 75 crashes per 100MVKT.

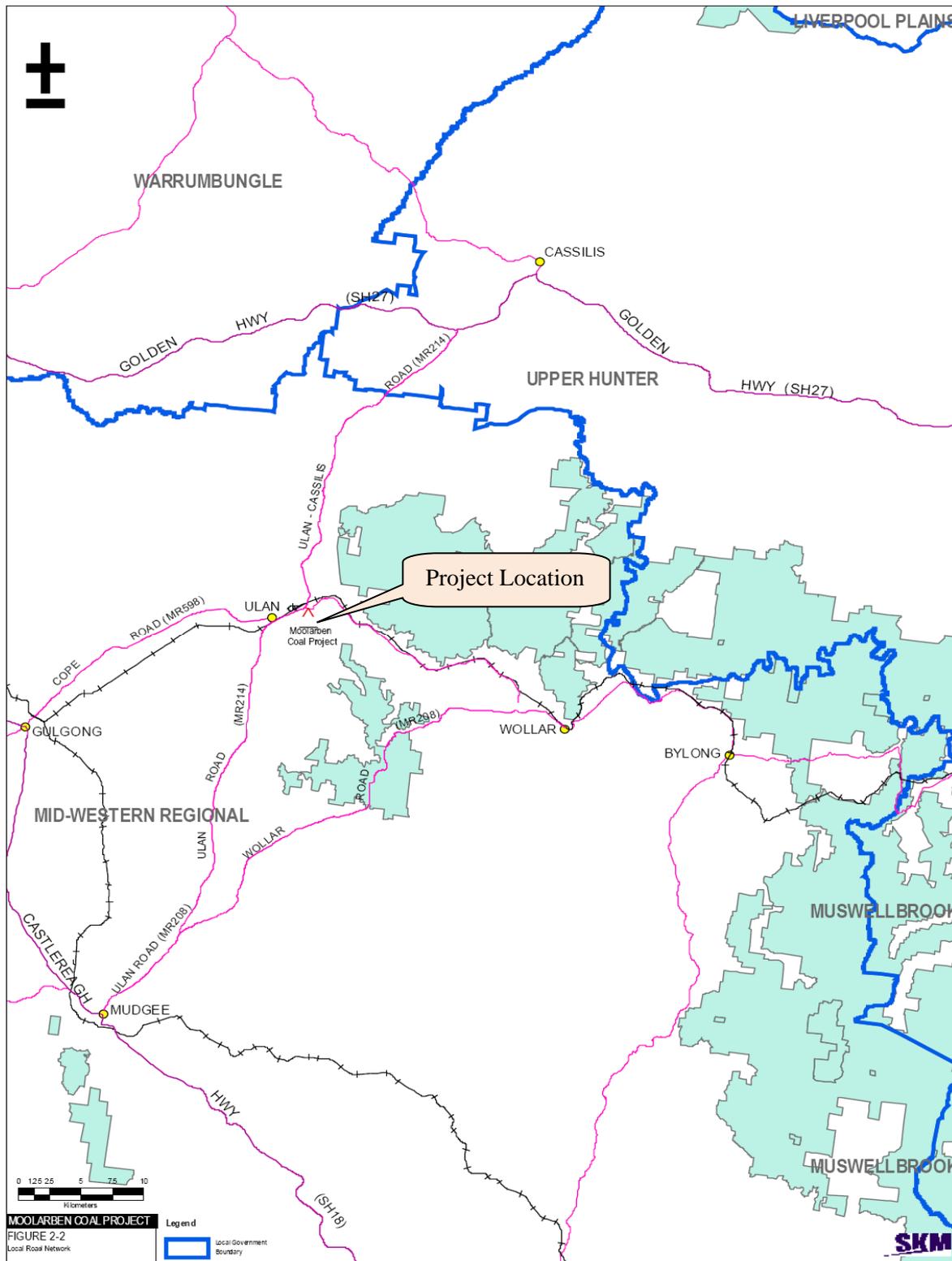
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<sup>4</sup> RTA Count Station 99.510





■ **Figure 2-2 Local Road Network**





## **2.4. Local Public Transport Network**

School bus services operate along several routes to/from and within Mudgee, Ulan and Gulgong, including along MR214 and MR598. Routes that pass near the proposed mine site include:

- Cooks Gap – Mudgee;
- Ulan – Mudgee;
- Ulan – Wollar;
- Turil – Gulgong;
- Yarrawanga – Gulgong; and
- Winchester Cr and Ridge Road – Ulan.

These buses are on the road generally between 07:30 and 09:00, and 15:00 and 17:00.

Countrylink runs coach services in the region, connecting with Cityrail and Countrylink rail services at Lithgow. These coach services are operated by Ogdens Coaches and stop at Countylink coach stops in each of the towns and villages that it passes through. On weekdays, there are two daily services (one morning, one afternoon/evening) in each direction between Gulgong and Lithgow. One service each day continues north to Coonabarabran, with one per week extending to Baradine. On Saturdays there is a morning service in each direction between Lithgow and Gulgong, and Sundays have two afternoon / evening services in each direction, with one from Coonabarabran and one from Gulgong. Travel time from Gulgong to Lithgow is around 3-4 hours, depending on the number and location of intermediate stops.

Ogdens Coaches also runs bus services in and around Mudgee, although these routes do not extend as far as the mine site.

## **2.5. Rail Network**

There are several rail lines in the region, although not all are in regular use. These include the Wallerawang to Gwabegar Railway which passes through Mudgee and Gulgong, and the Gulgong to Sandy Hollow which connects with the Main Northern Railway. This latter railway is used currently for the transport of coal from the Ulan Coal Mine, adjacent to the proposed Moolarben mine site. There are no regular passenger services in operation.



### 3. Proposed Development

The proposed Stage 2 development of the mine would involve one open cut area and two underground mines, increasing the production of the whole MCP to 13 million-tonnes per annum (Mtpa) of product coal. All coal would be transported from the mine site by rail. The proposed site layout is shown in **Figure 3-1** (overleaf).

#### 3.1. Operation and Internal Traffic Movements

Coal extracted from the proposed Stage 2 Open Cut 4 will be transported via private haul road to the Stage 2 ROM station located north east of the approved Open Cut 1. From the Stage 2 ROM Station coal will be stockpiled and conveyed under the Ulan-Wollar Road and over the Ulan-Sandy Hollow Railway Line to the Coal Processing Plant (CPP). Coal extracted from Underground 1 and Underground 2 will be processed and conveyed to the CPP via the approved Stage 1 ROM Station and associated conveyors. Access to the Underground No.1 and Underground No.2 surface facilities will be via private access road from the approved Open Cut 1 access road off the Ulan-Wollar Road. An internal access road connecting the Stage 1 and Stage 2 ROM Stations will also be constructed. There would be some internal staff movement between the CPP and the open cut areas along the Ulan-Wollar Road.

The mine would operate 24 hours per day.

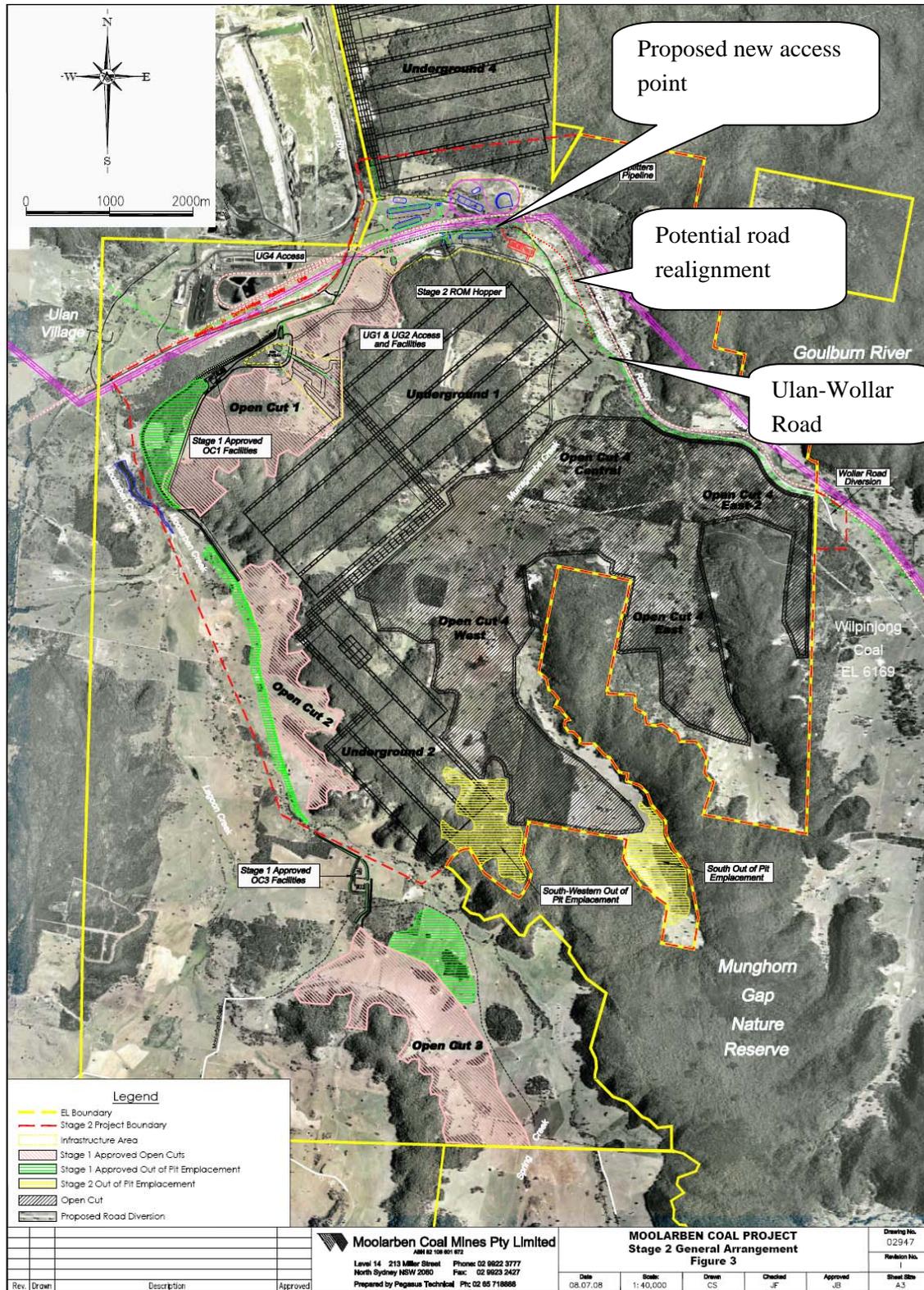
#### 3.2. External Road Access

Access to the Coal Handling and Processing Plant is proposed to be off the Ulan-Cassilis Road (MR214), approximately 400m north of the railway bridge. Another access to the open cut areas is proposed off the Ulan-Wollar Road, close to the intersection of Ulan-Cassilis Road and Ulan-Wollar Road. Both accesses were assessed in the Stage 1 Environmental Assessment.

In Stage 2 a separate access point is proposed for the open cut areas and facilities off Ulan-Wollar Road as shown in **Figure 3-1**. The proposed access location is on a relatively straight and flat section of the Ulan-Wollar Road. No speed limit is posted along this section of the road. The available sight distances were measured at this location. To the east, the sight distance is approximately 150m. To the west, there is at least 240m sight distance available. The sight distance in each direction is shown in **Figure 3-2** and **Figure 3-3**. The available sight distances at this proposed access point meet the requirements of Safe Intersection Sight Distance (SISD) for a design speed of 70km/hour in accordance with Austroads *Guide to Traffic Engineering Practice Part 5: Intersections at Grade*. Therefore the speed limit of this section of road needs to be reduced to 70km/hour.



■ Figure 3-1 Site Layout





■ **Figure 3-2 Sight Distance West from Proposed Access Point**





■ **Figure 3-3 Sight Distance East from Proposed Access Point**



It is also proposed to realign a section of the Ulan-Wollar Road in the future, starting approximately 3km from the intersection with Ulan-Cassilis Road, having regard to mining and surface facilities. The Ulan-Wollar Road alignment would shift to the east from its existing alignment as shown in **Figure 3-1**. The sight distances at the proposed new access point will be improved further due to this realignment of Ulan-Wollar Road.

### **3.3. Staffing**

The Moolarben Coal Project would employ about 317 people during operation of Stage 1 and an additional 122 people for the Stage 2 development. The various shifts for Stage 1 and Stage 2 are listed in **Table 3-1**.



■ **Table 3-1 Proposed Staffing Arrangements**

<b>Open Cut Operations (Stage 1)</b>						
	<b>Mon to Friday</b>			<b>Sat &amp; Sun</b>		
<b>Shift</b>	<b>Day</b>	<b>Day</b>	<b>Night</b>	<b>Day</b>	<b>Night</b>	
Times	07:00-17:00	06:30-19:00	18:30-07:00	06:30-19:00	18:30-07:00	
Personnel	21	30	30	20	19	
<b>Total allowing for rosters, absentees etc</b>						<b>120</b>
<b>Underground No.4(Stage 1)</b>						
	<b>Mon to Friday</b>			<b>Fri Sat &amp; Sun</b>		
<b>Shift</b>	<b>Day</b>	<b>Day</b>	<b>Afternoon</b>	<b>Night</b>	<b>Day</b>	<b>Night</b>
Times	07:00-17:00	06:30-15:00	14:30-23:00	22:30-07:00	06:30-19:00	18:30-07:00
Personnel	29	30	29	31	23	22
<b>Total allowing for rosters, absentees etc</b>						<b>162</b>
<b>CHPP(Stage 1)</b>						
	<b>Mon to Friday</b>			<b>Sat &amp; Sun</b>		
<b>Shift</b>	<b>Day</b>	<b>Day</b>	<b>Night</b>	<b>Day</b>	<b>Night</b>	
Times	07:00-17:00	06:30-19:00	18:30-07:00	06:30-19:00	18:30-07:00	
Personnel	5	10	5	5	5	
<b>Total allowing for rosters, absentees etc</b>						<b>30</b>
<b>Stage 2</b>						
	<b>Mon to Friday</b>			<b>Sat &amp; Sun</b>		
<b>Shift</b>	<b>Day</b>	<b>Day</b>	<b>Night</b>	<b>Day</b>	<b>Night</b>	
Times	07:00-17:00	06:30-19:00	18:30-07:00	06:30-19:00	18:30-07:00	
Personnel	41	41	40	-	-	
<b>Total allowing for rosters, absentees etc</b>						<b>122</b>

**3.4. Traffic Generation**

For the purposes of assessing traffic generation from the proposal, it has been assumed that the average car occupancy of staff driving to the site would be 1, that is, everyone drives their own car. Furthermore, there would be no use of public transport by staff. So the number of staff would equal the number of vehicles.

The peak number of vehicle movements which include Stage 1 and Stage 2 traffic would occur on a weekday between 06:00 and 07:00, when 207 people would arrive at the site for day shifts. In the following hour, there would be 104 staff leaving after night shift. The maximum hourly load could



be as high as 311 vehicles, although this is likely to be spread over close to 2 hours. Due to the staggered finishing times of the day shifts, the evening peak hour would be between 17:00 and 18:00, when 96 people would leave the site. The preceding hour would see 75 staff arrive for night shift.

On weekends, the peak traffic generation would be 48 vehicles arriving and 46 vehicles leaving between 06:00 and 08:00, and the same number between 18:00 and 20:00.

**Figure 3-4** shows the spread of arrivals and departures across the day.

■ **Figure 3-4 Movement of Staff To/From the Site (Weekdays)**



The majority of mine staff are assumed to reside in the Mudgee and Gulgong areas, and use MR214 and MR598 to travel between their home and the mine. The use of other roads by mine staff is expected to be minimal. All coal would be transported from the site by rail.



### **3.4.1. Traffic Generation from the Wilpinjong Coal Project**

The Wilpinjong Coal Project is located east of the Moolarben Coal Project, between the Ulan-Wollar Road and the Wollar Road (MR208). Although not assessed in the EIS<sup>5</sup>, access to the Wilpinjong site is to be via the Ulan-Wollar Road and MR214 (the EIS assumed access would be via the Wollar Road (MR208). Additional information prepared for the Wilpinjong Coal Project assessing the impact of this change in access arrangements is not available to inform this present study. As such, a worst case has been assumed, with all Wilpinjong traffic using the Ulan-Wollar Road and MR214. The peak traffic generation from the Wilpinjong Coal Project would be from the movement of staff. The Wilpinjong EIS states that there would be 2 shifts per day of 71 people (06:30 to 19:00 and 18:30 to 07:00) as well as 20 administration staff working from 07:00 to 17:00.

The peak hour in terms of traffic generation would be between 06:00 and 07:00, with 91 movements (all arrivals). The following hour would see a further 71 vehicles leave after the night shift. So it is conceivable that there could be up to 162 vehicle movements in a one-hour period.

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<sup>5</sup> Wilpinjong Coal Project Environmental Impact Statement, May 2005. Appendix K Road Transport Assessment.



## 4. Operational Traffic Impact Assessment

### 4.1. Road Capacity

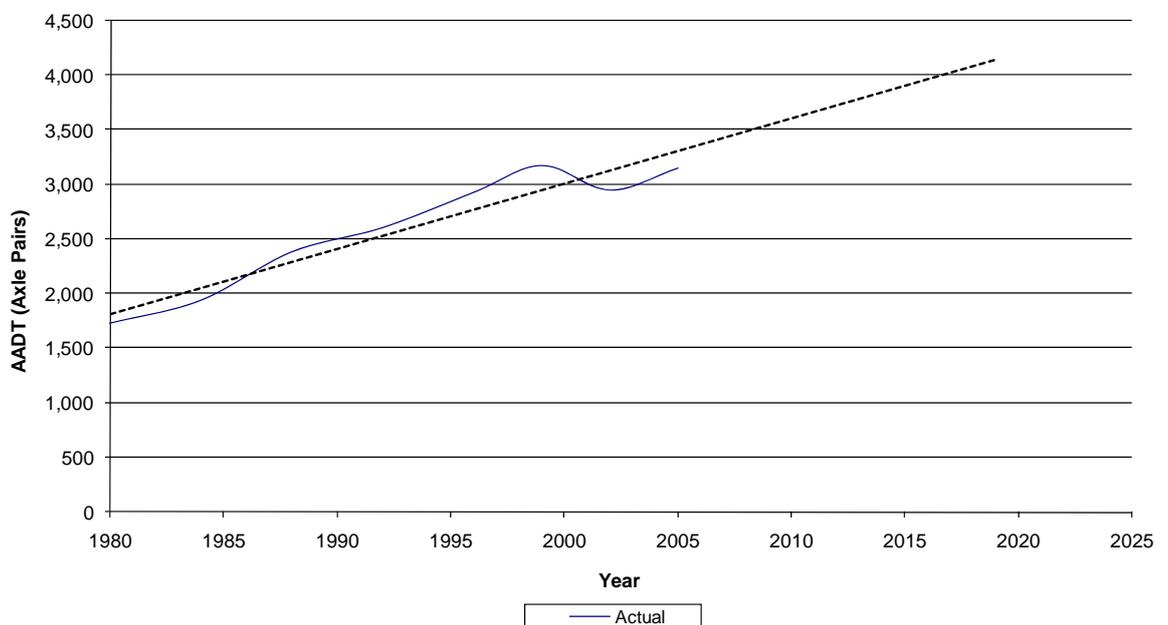
Forecasts of traffic volumes on key roads have been made based on historic traffic volume data from the RTA. A linear trend has been drawn from data from 1984 to 2005, and extrapolated to 2009 and 2019. This has been done for SH18, MR214 and MR598, as shown below in **Figure 4-1**, **Figure 4-2** and **Figure 4-3** respectively.

Despite a small reduction in traffic between 1999 and 2002, the general trend since 1984 on SH18 North of Mudgee is for steady growth.

■ **Figure 4-1 SH18 Traffic Volume Growth**

RTA Count Station	Location	ADT (Axle pairs)	1984	1988	1992	1996	1999	2002	2005	2009	2019
99.165	Between Mudgee & Gulgong	Actual	1,940	2,384	2,607	2,930	3,177	2,951	3,153	n.a.	n.a.
		Trend	2,057	2,296	2,534	2,773	2,952	3,131	3,310	3,549	4,146

**SH18 North of Mudgee**



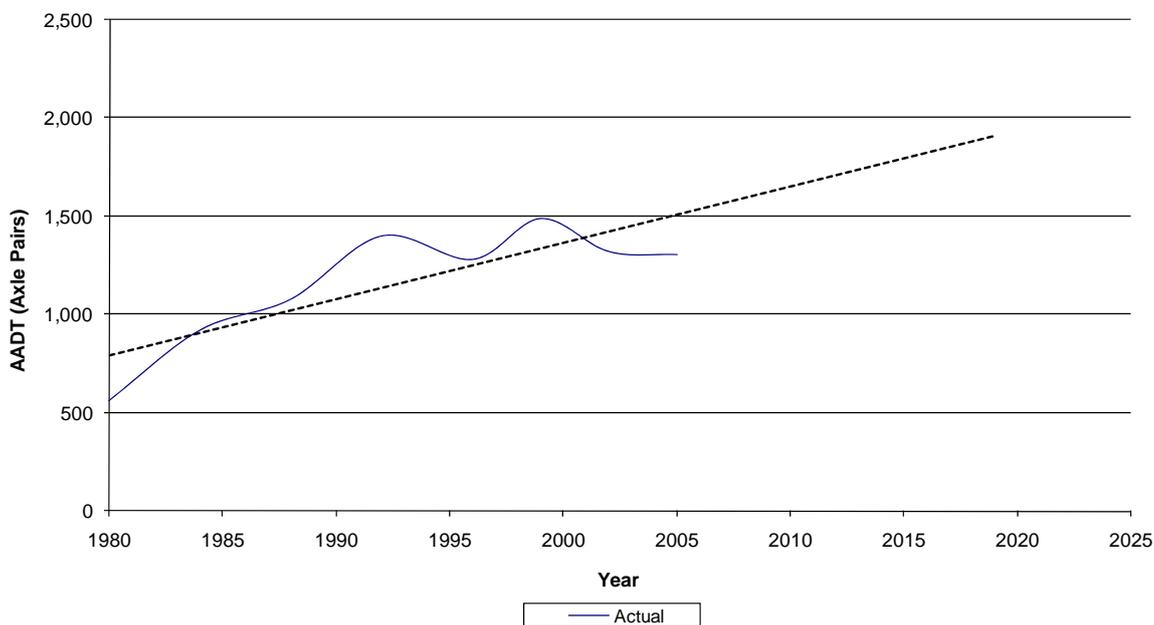
Traffic volumes on MR214 also decreased slightly from 1999 to 2005, with an additional dip in 1996. However, the fluctuation in volumes has generally followed a rising linear trend.



■ **Figure 4-2 MR214 Traffic Volume Growth**

RTA Count Station	Location	AAADT (Axle pairs)	1984	1988	1992	1996	1999	2002	2005	2009	2019
99.221	North of Budgee Budgee	Actual	920	1,078	1,401	1,281	1,490	1,321	1,306	n.a.	n.a.
		Trend	904	1,019	1,134	1,249	1,335	1,421	1,507	1,622	1,909

**MR214 North of Budgee Budgee**



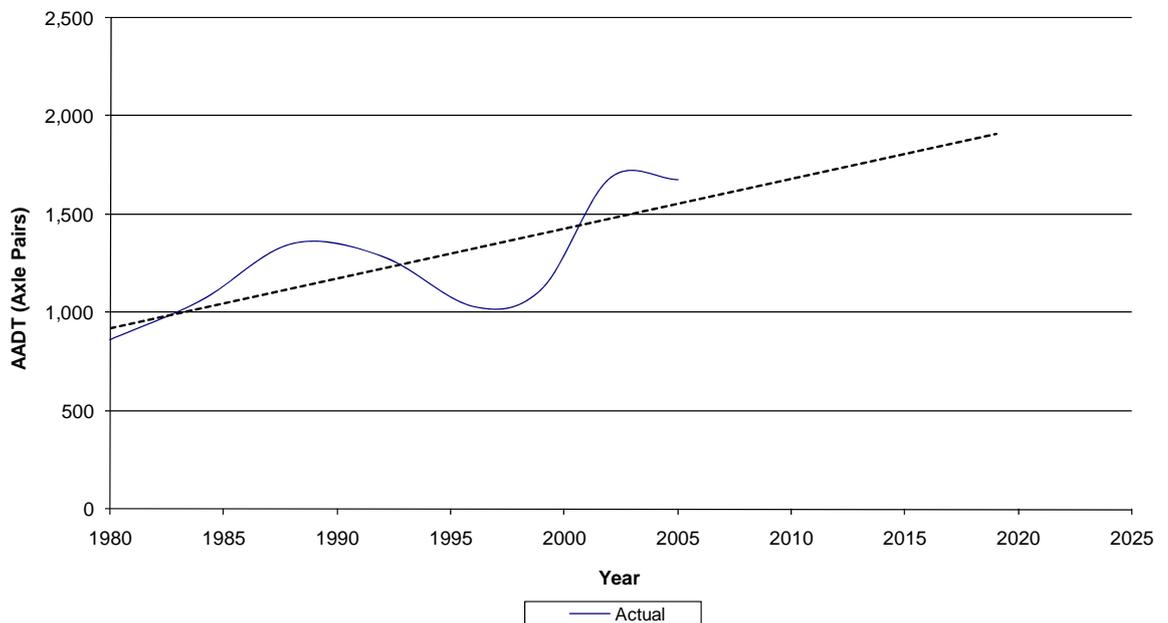
On MR598, there has been a very wide fluctuation in traffic volumes, with a peak in 1988 and a trough in 1996 and 1999. The 2002 data suggests another peak. The linear trend is the best approximation available for the purpose of estimating future traffic volumes.



■ **Figure 4-3 MR598 Traffic Volume Growth**

RTA Count Station	Location	AADT (Axle pairs)	1984	1988	1992	1996	1999	2002	2005	2009	2019
99.510	East of Gulgong	Actual	1,060	1,350	1,285	1,029	1,119	1,685	1,677	n.a.	n.a.
		Trend	1,024	1,125	1,226	1,328	1,404	1,480	1,556	1,657	1,910

**MR598 East of Gulgong**



The capacity of rural two-lane roads can be estimated using the Austroads Guide to Traffic Engineering Practice Part 2 (Roadway Capacity), which takes into account the effect of factors such as pavement width and terrain. The capacity refers to the peak one-hour period. There is no data available on the distribution of traffic on these roads across the day, although a peak hour factor can be estimated based on peak hour counts undertaken for the Wilpinjong Coal Project Road Transport Assessment. This study counted 73 vehicles on MR214 north of MR208 between 06:00 and 07:00. This is approximately 10% of the measured daily volume at the same time.

For SH18, the acceptable capacity would be around 1,260 vehicles (axle pairs) per hour (two-way volume). Even using the 2019 forecast volume, the peak hour volume would be around 415, which is well within the theoretical capacity of the road. For the other roads, with minimal shoulder provisions and narrow lanes, the acceptable capacity would be about 820 vehicles (axle pairs) per hour. In the 2019 base case the peak hour volumes would be 190 and 191 vehicles per hour on MR214 and MR598 respectively. These are similarly well within the theoretical capacity of the



road. Even adding the worst-case traffic generation from the Moolarben Coal Project (311 vehicles per hour between 06:30 and 07:30) and from the Wilpinjong Coal Project (162 vehicles) the theoretical capacity of the roads would not be exceeded.

## **4.2. Impact on Intersections**

An assessment of intersection operation was undertaken as part of the assessment for the Wilpinjong Coal Project. The intersections assessed for that project were Church Street / Short Street (Mudgee), Henry Lawson Road / Mudgee-Ulan Road (MR214), and Mudgee-Ulan Road (MR214) / Wollar Road (MR208). The Wilpinjong report concluded that all of these intersections would operate at Level of Service A, both with and without the Wilpinjong project, with significant spare capacity. The expected volume of traffic that would be generated by the Moolarben project would not alter these intersection operation characteristics. The changed access arrangements for the Wilpinjong Coal Mine would now see potentially all traffic from that site using the intersection of Ulan-Wollar Road with MR214.

### **4.2.1. Intersection of Ulan-Cassilis Road (MR214) and Cope Road (MR598)**

Background vehicle turning movements in the peak hour at the intersection of Cope Road and Ulan Road have been estimated from the forecast AADTs on Cope Road and MR214 in 2019 using the following assumptions:

- In the morning peak 80% of traffic on MR214 will remain on MR214, and the remaining 20% will travel to or from MR598.
- In the morning peak 80% of traffic on MR598 will travel to or from the north and the remaining 20% will be travel between Gulgong and Mudgee via MR214.
- The morning peak direction on MR214 is northbound, with 80% of the traffic. This is based on data from the Wilpinjong EIS. In the evening peak, there is an even directional split.
- The morning peak direction for traffic travelling between Gulgong and Mudgee via MR598 is towards Mudgee. The reverse applies in the evening peak.
- Peak hour traffic is 10% of AADT.

In order to provide a worst-case assessment of the intersection operation, three scenarios or employee distribution have been investigated as follows:

- Scenario 1- 100 percent of staff of the proposed Moolarben Coal Project (Stage 1 and Stage 2) and Wilpinjong Coal Project live in Gulgong;
- Scenario 2- 100 percent of staff of the proposed Moolarben Coal Project (Stage 1 and Stage 2) and Wilpinjong Coal Project will live in Mudgee; and



- Scenario 3- 80 percent of staff of the proposed Moolarben Coal Project (Stage 1 and Stage 2) and Wilpinjong Coal Project live in Mudgee and the other 20 percent in Gulgong. This is the most likely scenario.

The intersection has been modelled using SIDRA with the future background turning movements in 2019 and the estimated additional traffic that will be generating from both the Moolarben and Wilpinjong Coal projects. In order to consider the worst-case further assumptions have been made as follows:

- The commuter peak coincides with the mines operational peak hour.
- 100% of the mine staff will be using private cars
- Vehicle occupancy rate is 1.0 people per vehicle.

The SIDRA analysis concluded that both the morning and evening peak periods the intersection is performing satisfactorily in accordance with the Level of Service criteria set by the RTA as outlined in **Table 4-1**.

■ **Table 4-1 Level of Service Criteria (LoS)**

Level of Service	Average Delay (seconds/vehicle)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays	At capacity, requires other control mode
F	More than 70	Roundabouts require other control mode	

Source: Guide to Traffic Generating Developments, RTA 2002.

The results of the SIDRA analysis of the intersection under each scenario are shown in **Table 4-2 below**. The level of service is determined from the movement with the worst delay.



■ **Table 4-2 Intersection of Ulan-Cassilis Road (MR214) and Cope Road(MR598), 2019**

Scenario	AM Peak		PM Peak	
	LoS	Average Delay (Seconds)	LoS	Average Delay (Seconds)
Scenario 1	B	14.5	A	13.5
Scenario 2	B	15.9	A	13.5
Scenario 3	B	15.6	A	13.5

**4.2.2. Intersection of Ulan-Cassilis Road (MR214) and Ulan-Wollar Road**

Background vehicle turning movements at the intersection of Ulan-Wollar Road and Ulan-Cassilis Road have been estimated from the projected AADTs on Ulan-Cassilis Road (MR214) in 2019 using the following assumptions:

- Only Moolarben and Wilpinjong Coal Mine traffic would use Ulan-Wollar Road in the peak hour.
- The morning peak direction on MR214 is northbound, with 80% of the traffic. This is based on data from the Wilpinjong EIS. In the evening peak, there is an even directional split.
- Peak hour traffic is 10% of AADT.

The intersection has been modelled using SIDRA with the future peak hour background turning movements in 2019 and the estimated additional traffic that will be generating from both the Moolarben and Wilpinjong Coal project. The results of the SIDRA analysis of the intersection are shown in **Table 3-3** below. The results show that the intersection is operating at a satisfactory level of service in both the morning and evening peak hours without any modification to the intersection.

■ **Table 4-3 Intersection of Ulan-Cassilis Road (MR214) and Ulan-Wollar Road, 2019**

Intersection	AM Peak		PM Peak	
	LoS	Average Delay (Seconds)	LoS	Average Delay (Seconds)
Ulan-Cassilis Rd/ Ulan-Wollar Rd	A	13.1	A	14.1

Despite the intersection having sufficient capacity, some modifications would be required to the intersection of MR214 with the Ulan-Wollar Road to improve safety. These modifications would include linemarking at the intersection to provide formal auxiliary lanes on MR214 for turning traffic. Upgrade of this intersection has been approved in Stage1 application.



### **4.3. Road Safety**

An assessment has been made of the potential for increased crashes on MR214 and MR598 due to the increase in traffic associated with the development of the Moolarben (Stage 1 and 2) and Wilpinjong mine projects. It is assumed that the crash rates calculated in **Section 2.3** would be expected to remain constant, and the additional traffic using the road would be exposed to road crashes at the same rate as traffic currently using the road. However, as part of Stage 1, the Moolarben Coal Project has contributed funds to Mid Western Regional Council for safety upgrades of MR214 and MR598. It is also acknowledged that Council is committed to improving the safety of these roads independent of contributions from the Moolarben Coal Project.

The combined Moolarben Coal Project and Wilpinjong project would be expected to add approximately 800 vehicles per day to MR214. With no changes to the road environment, an additional 3.9 crashes per year would be expected. Similarly, an additional 200 vehicles per day would use MR598, resulting in an average of 0.7 crashes per year. With no changes to the safety of these roads, an additional 4.7 crashes per year could be expected over the base case. The contribution of the combined Moolarben Coal Project would be approximately 70%.

The road safety improvements being partly funded by the Moolarben Coal Project and constructed by Council will address, amongst others, the key issues of delineation and pavement condition, which will greatly improve the safety of these roads for all road users. It is expected that the crash rates on these roads will decrease as a result of improvements to the road environment.

### **4.4. Public Transport**

The proposal would have no impact on the operation of public transport services. School bus services would pass by the mine site between 08:00 and 09:00, and between 15:30 and 17:00. The movement of staff during these times would be minimal.

### **4.5. Road Closure and Diversion**

Carrs Gap Road, Murragamba Road and other un-formed roads will be affected by open cut mining. The private haul road from Open Cut 4 will cross the infrequently used Carrs Gap / Murragamba Road. Moolarben Coal Project proposes the closure or diversion of these roads. Details of the diversions or closure will be considered in the future in consultation with Council and other stakeholders. However, should closure of these roads not be possible, at grade intersections will be constructed with traffic priority to the public roads in order to maintain access along all public roads.

Diversion of a section of Ulan-Wollar Road as part of Stage 1 has been approved. It is proposed to relocate another portion of the Ulan-Wollar Road as shown in **Figure 3-1**. The new road



alignment could be constructed with minimal impact on existing road users, with a smooth transition from the old to new alignments once opened. Full access between Ulan and Wollar would be maintained throughout the construction and operation of the proposal.



## 5. Construction Traffic Impact Assessment

### 5.1. Development and Construction Details

Moolarben Coal Mines Pty Limited (MCM) estimate that the initial construction period would run for about 18 months, and employ some 200 workers. The construction period would start in about July 2009.

The components of initial construction would include:

- Infrastructure; and
- Open Cut 4 Surface Facilities.

Construction of underground 1 and 2 access drifts and associated facilities will commence in the year 5 and 10 of the mine life-cycle respectively.

### 5.2. Traffic Generation and Impact Assessment

There would be up to 200 workers employed per day during the construction phase. Hours of construction would be 07:00 to 18:00. As a worst case, assuming a car occupancy of 1 person per vehicle, this would result in 200 cars arriving at the site between 06:00 and 07:00, and the same number leaving between 18:00 and 19:00. This would be a noticeable increase on the base load, but would not adversely impact on road or intersection capacity, due to the low traffic volumes currently on these roads.

Intersection of Cope Road and Wollar Road with Ulan-Cassilis Road have been analysed with the construction traffic, MCP Stage 1 and Wilpinjong Coal Mine traffic on top of base load in 2009 estimated from the projected traffic volume on MR214 west of Cope Road, and using similar assumptions as in **Section 4.2.1** and **Section 4.2.2**.

The intersections have been modelled using SIDRA with the future peak hour background turning movements in 2009 and the estimated additional traffic. The results of the SIDRA analysis of the intersections are shown in **Table 5-1** and **Table 5-2** below. The results show that the intersection will operate at a satisfactory level of service in both the morning and evening peak hours without any modification to the capacity of the intersections. Moreover, there would likely be some staggering of arrivals and departures.



- **Table 5-1 Intersection of Ulan-Cassilis Road (MR214) and Cope Road (MR598), 2009 with construction traffic.**

Scenario	AM Peak		PM Peak	
	LoS	Average Delay (Seconds)	LoS	Average Delay (Seconds)
Scenario 1	B	14.5	A	13.4
Scenario 2	B	16.1	A	13.4
Scenario 3	B	16.0	A	13.4

- **Table 5-2 Intersection of Ulan-Cassilis Road (MR214) and Ulan-Wollar Road, 2009 with construction traffic.**

Directional split	AM Peak		PM Peak	
	LoS	Average Delay (Seconds)	LoS	Average Delay (Seconds)
Ulan-Cassilis Rd/ Ulan-Wollar Rd	A	13.1	A	14.2

In terms of truck movements associated with the transport of materials to the site, the following are assumed based on advice from MCM:

- Up to 20 concrete trucks per day during major pours;
- Up to 6 trucks per day carrying equipment for construction of other Stage 2 facilities; and
- A total of 100 wide loads carrying mining excavators and dump trucks.

Aside from the wide loads, the truck movements to and from the site are not expected to have a significant impact on traffic flow and intersection operation in the area. The type of trucks to be used are not inconsistent with current usage of the roads around the mine site. The wide loads would be subject to the granting of permits from the RTA, and would require a separate traffic management plan, which would depend on the origin of each load. The movement of the wide loads would be timed to minimise obstruction to other road users.



In 2009, the peak hour volumes would be 162 and 166 vehicles per hour on MR214 and MR598 respectively. These are well within the theoretical capacity of the road. Adding the traffic generation from the Stage 1 Moolarben Coal Project (189 vehicles per hour between 06:30 and 07:30), from the Wilpinjong Coal Project (162 vehicles) and the construction traffic (200 vehicles in the peak hour) the theoretical capacity of the roads would not be exceeded.

### **5.3. Preliminary Construction Traffic Management Plan**

During the construction period, the following general principles will apply in regard to traffic management:

- Access along all public roads will be maintained at all times;
- Where temporary road closures are required, detours will be constructed around the worksite. Where it is not possible to provide a 2-way detour, portable traffic signals will be used to regulate traffic flow in each direction;
- The movement of heavy vehicles, and in particular over-size loads, would be arranged so as to minimise disruption to traffic during the before and after school periods; and
- Separate traffic management plans would be in place for the movement of over-size vehicles.



## 6. Conclusions and Recommendations

This report has examined the traffic implications of the proposed Moolarben Coal Project (Stage 2). The report has discussed the proposed access arrangements and likely traffic generation, impact on intersections and roadway capacity both during the operation of the mine and construction phase,

The volume of traffic that would be generated by the operation and construction of the mine site would not significantly impact on traffic flow in the area, and the nominal capacity of the roads to Mudgee and Gulgong would not be exceeded.

One additional access point is proposed as part of the Stage 2 of the project off the Ulan-Wollar Road, a portion of which would be re-aligned in the future as part of the project.

The Moolarben Coal Project (Stages 1 and 2) will not introduce an unacceptable level of traffic on to the road network and that movements to and from the site can occur in a safe and efficient manner. Contributions to road safety improvements on MR214 and MR598 made as part of the Moolarben Coal Project Stage 1 will improve safety on these roads for all road users. However, the following works are recommended:

- Vegetation needs to be cleared to the west of the proposed access point on Ulan- Wollar Road to improve sight distance.
- The speed limit on Ulan-Wollar Road in the vicinity of the proposed access point needs to be reduced to 70km/hour with regulatory and advisory signs as appropriate.



## 7. References

The following documents were referred to in undertaking this study:

- Austroads Guide to Traffic Engineering Practice Part 5 (Intersections at Grade).
- Wilpinjong Coal Project Environmental Impact Statement, May 2005. Appendix K Road Transport Assessment.
- RTA Traffic Volume Data Western Region 2005.