



Sunnyside Coal Mine
via Gunnedah
Modification
Traffic and Transport Review

transportation planning, design and delivery

Sunnyside Coal Mine


via Gunnedah, Modification

Traffic and Transport Review

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1. Introduction

This report has been prepared to present the findings of a review of the traffic and transport implications of a proposal to recommence mining operations at the Sunnyside Coal Mine (the Modification).

1.1 Sunnyside Coal Mine

Sunnyside Coal Mine (Sunnyside) is located approximately 15 kilometres (km) west of Gunnedah in central northern New South Wales (NSW).

Sunnyside is currently approved to extract up to 1 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal. The coal mine is a conventional open cut operation, with associated mine-related infrastructure including a ROM coal stockpile, on-site primary crushing facility, conveyor, coal load-out bin, and ancillary surface facilities including offices and a workshop. The product coal is transported from the mine site to Whitehaven's Gunnedah coal handling and preparation plant (CHPP), which is located approximately 8 km to the east-northeast (approximately 16 km by road). The approved haulage route is shown on **Figure 1.1**. Laden trucks follow this route to the Whitehaven CHPP, and empty trucks return along the same route:

- Sunnyside Access Road
- Right onto realigned Coocooboonah Lane (2.7km)
- Left onto Oxley Highway (6.7km)
- Left onto Blackjack Road (3.0km)
- Right onto Quia Road (0.8km)
- Left under rail overpass
- Left onto Torrens Road (0.6km)
- Torrens Road Access Way, a private road on Whitehaven property (1.3km).

In accordance with Condition 5, Schedule 2 of Project Approval 06_0308, mining operations may take place for seven years from the grant of the mining lease for the Sunnyside Coal Project. The Sunnyside mining lease (ML 1624) was granted on 5 November 2008, which means that mining operations are currently approved until 5 November 2015.

Due to unfavourable economic conditions, Whitehaven discontinued mining operations at Sunnyside on 29 November 2012, however, stockpiled ROM coal continued to be transported to Whitehaven's CHPP on a campaign basis until May 2013. Activities at the mine site since then have been limited to the clearing of remaining ROM coal stockpiles, environmental monitoring, ongoing rehabilitation, and care and maintenance of the site (including spontaneous combustion management).

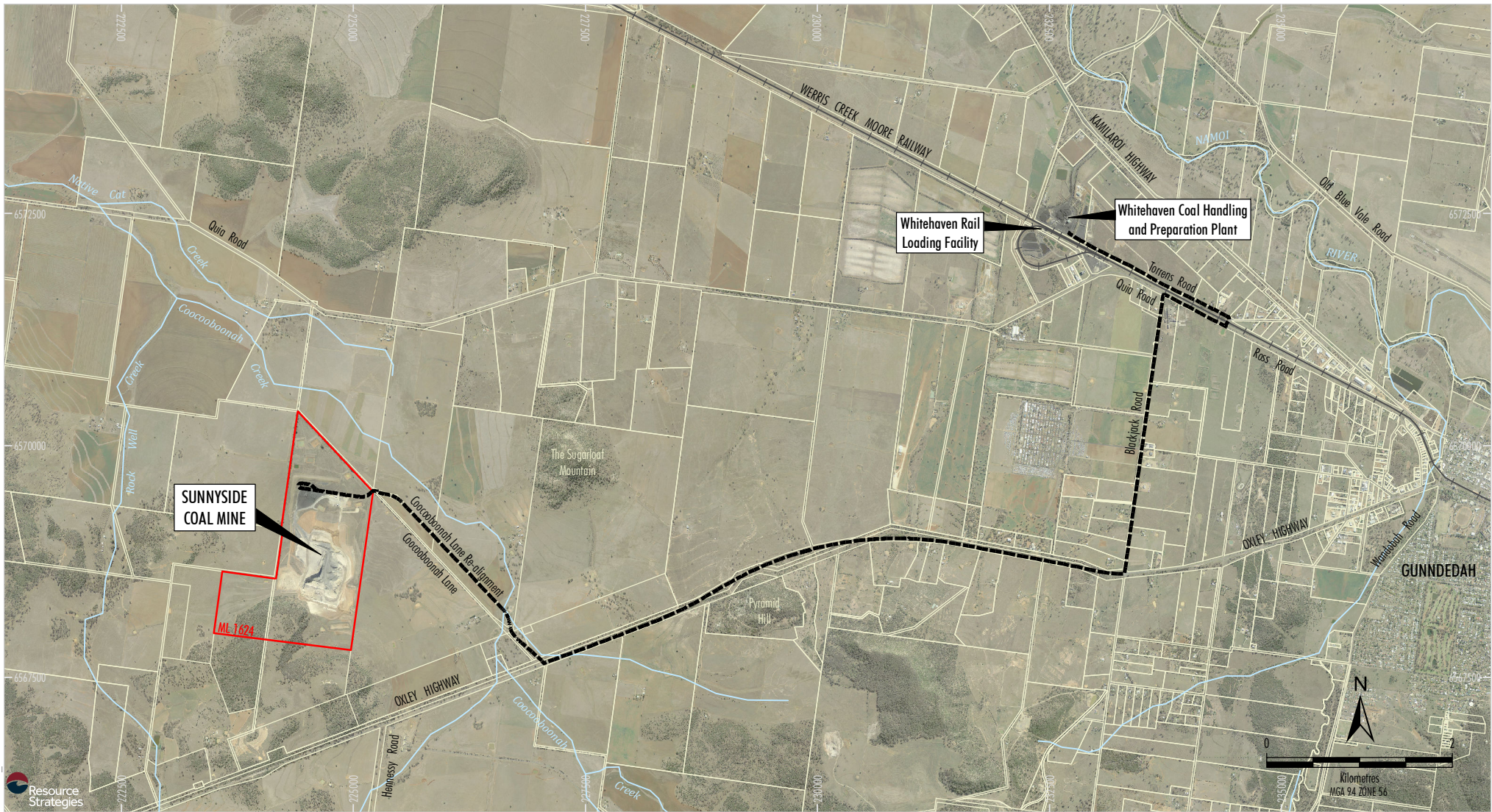
1.2 The Modification

Whitehaven wishes to maintain a current Development Consent at the Sunnyside Mine to enable the extraction of the remaining coal within the approved open cut footprint should current adverse economic conditions change.

The proposal would extend the life of Sunnyside beyond the currently approved 2015 date. Accordingly, Whitehaven requires a modification to Project Approval 06_0308 (the Modification) to authorise the extraction of coal from the approved open pit area after November 2015 for a further period of up to five (5) years.

The Modification would not change the following aspects of the approved operations, which are relevant to transport:

- Coal haulage route to the Whitehaven CHPP
- ROM coal haulage hours (i.e. 7.00am and 6.00pm Monday to Friday, extended during Eastern Summer Time to between 7.00am and 8.00pm, and between 7.00am and 4.00pm on Saturdays)
- Employee numbers
- Deliveries
- Maximum annual ROM coal or waste rock production
- Hours of operation.



WHC-14-19_203E



- LEGEND**
- Mining Lease Boundary
 - Coal Haulage Route

Source: Department of IP&I (2010);
Orthophoto (2011)



WHITEHAVEN COAL

SUNNYSIDE COAL MINE

Coal Haulage Route

Figure 3

2. Previous Assessment and Approved Operations

This section describes the traffic and transport aspects previously investigated as part of the Environmental Assessment for Sunnyside, the Project Approval, and the operating conditions relating to Sunnyside during its operational phase.

2.1 Previous Traffic and Transport Assessment

As part of the Environmental Assessment of the Sunnyside Coal Project, a traffic and transport assessment was undertaken by Constructive Solutions Pty Ltd in October 2007.

The assessment considered the potential impacts associated with the following vehicle movements, on the basis of coal extraction at the maximum approved rate of 1 Mtpa:

- Average transport of 3,500 tonnes (t) ROM coal per day.
- Average of 250 heavy vehicle trips per day on the approved haul route using 28t capacity articulated vehicles (approximately 125 loads per day), or alternatively an average of 176 heavy vehicle trips per day on the approved haul route using 40t capacity B-Doubles (average of 88 loads per day). A trip is a one way movement, so a truck generates one trip when laden from Sunnyside to the CHPP, and generates one trip returning unladen from the CHPP to Sunnyside.
- Workforce of 24 full time employees and 7 part time employees accessing the site per day, the majority of whom would reside in Gunnedah or its immediate vicinity. Less than 25 percent of the workers were expected to reside either to the west or northwest of the site.
- Other traffic generated (deliveries and visits by management and regulatory authorities) of approximately 10 vehicles per day, of which 20 percent would be commercial vehicles.

As a result of these vehicle movements, it was predicted the proportional increase in commercial vehicles as a result of Sunnyside would be significant on all roads (Constructive Solutions Pty Ltd, 2007).

The primary impacts associated with the use of B-Doubles were predicted to be the dimensional capacity of the road infrastructure and traffic interaction. Road works along the haulage route between Sunnyside and the Whitehaven CHPP were recommended by Constructive Solutions Pty Ltd (2007) to mitigate these potential impacts. These recommendations related to road and intersection upgrades to accommodate or improve semitrailer or B-Double manoeuvres and/or to minimise the impact of the trucks on through traffic.

The recommendations ultimately formed conditions of the Sunnyside Project Approval (06_0308) (Section 2.3), and were required to be completed prior to transport of coal off-site, and to the satisfaction of the NSW Road Transport Authority and/or Gunnedah Shire Council. These actions have now been completed and an agreement has been put into place with the Gunnedah Shire Council.

2.2 Approved Road Transport Movements

Table 2.1 summarises the expected weekday daily traffic on the road network generated by Sunnyside, based on the information presented in the traffic and transport assessment, with some additional assumptions regarding the distribution of traffic. The traffic presented in Table 2.1 is based on exclusive use of articulated vehicles with a capacity of 28t to transport coal, and assumes coal is transported at the maximum approved rate of 1 Mtpa.

Table 2.1 indicates Sunnyside is approved to generate some 290 vehicle trips per day, the majority of which would be trucks associated with the transportation of coal to the CHPP.

Table 2.1: Approved Project Average Daily Traffic Generation (vehicle trips per day)

Road and Location	Light Vehicles		Heavy Vehicles		Total Vehicles	
	Employees	Visitors	Coal ^A	Deliveries	Light	Heavy
Coal Haulage Route						
Coocooboonah Lane North of Oxley Highway	20	16	250	4	36	254
Oxley Highway East of Coocooboonah Lane	15	16	250	4	31	254
Blackjack Road North of Oxley Highway	0	6	250	0	6	250
Quia Road East of Blackjack Road	0	6	250	0	6	250
Torrens Road West of Quia Road	0	6	250	0	6	250
Other Routes						
Oxley Highway West of Coocooboonah Lane	5	0	0	0	5	0
Oxley Highway East of Blackjack Road	15	10	0	4	25	4

^A average day using articulated trucks (28 t payload) to transport coal at maximum approved extraction rate of 1 Mtpa
Data derived from Constructive Solutions, 2007

Table 2.2 presents estimates of total traffic volumes with Sunnyside operating, based on the background traffic volumes and Project traffic generation presented in Constructive Solutions (2007) and some additional assumptions regarding their distribution on the road network.

As shown in Table 2.2, it was anticipated Sunnyside would contribute a significant proportion of heavy vehicle traffic along the coal haulage route.

Table 2.2: Daily Traffic Volumes with Sunnyside (vehicles per day)

Road and Location	Background Traffic Sunnyside Not Operating ^A		Sunnyside Project Approval ^B		Total Traffic	
	Light	Heavy	Light	Heavy	Light	Heavy
Coal Haulage Route						
Coochooboonah Lane North of Oxley Highway	12	3	36	254	48	257
Oxley Highway East of Coochooboonah Lane	1,250	475	31	254	1,283	729
Blackjack Road North of Oxley Highway	200	75	6	250	206	325
Quia Road East of Blackjack Road	732	198	6	250	738	448
Torrens Road West of Quia Road	20	5	6	250	26	255
Other Routes						
Oxley Highway West of Coochooboonah Lane	1,250	475	5	0	1,255	475
Oxley Highway East of Blackjack Road	1,250	475	25	4	1,275	479

A based on Constructive Solutions (2007)

B average day using articulated trucks (28 t payload) to transport coal at maximum approved extraction rate of 1 Mtpa

2.3 Sunnyside Coal Project Approval 06_0308

The vehicle movements and associated potential impacts described by Constructive Solutions Pty Ltd (2007) were subsequently approved subject to Sunnyside operating in accordance with the conditions of Project Approval 06_0308.

Conditions relevant to road transport include:

Schedule 2

6. *The Proponent shall not extract more than 1 million tonnes of ROM coal a year from the site.*
7. *The Proponent shall use the coal transport route shown in Figure 2 of Appendix 2 to transport all coal from the site to the Whitehaven CHPP. (Refer to Figure 1.1: for the coal transport route.)*
10. *Transport of coal may take place only between 7 am to 6 pm Monday to Friday (or between 7 am to 8 pm during Eastern Summer Time) and between 7 am to 4 pm on Saturdays, and not on Public Holidays.¹*

Schedule 3:

34. *The Proponent shall keep records of the amount of coal transported from the site each year, and include these records in the AEMR [Annual Environmental Management Report].*
35. *Prior to transporting any coal off-site, the Proponent shall:*
 - a) *construct a realignment of Coochooboonah Lane to the satisfaction of the landowner and Council;*
 - b) *upgrade the intersection of Coochooboonah Lane and the Oxley Highway to the satisfaction of the RTA and Council;*

¹ Schedule 3 Condition 39 specifically excludes the transport of coal from the site during AgQuip.

- c) upgrade the intersection of the Oxley Highway and Blackjack Road to the satisfaction of the RTA and Council;
 - d) upgrade the section of Blackjack Road to be used for coal transport to the satisfaction of Council;
 - e) upgrade the intersection of Blackjack Road and Quia Road to the satisfaction of Council;
 - f) upgrade the section of Quia Road to be used for coal transport to the satisfaction of Council;
 - g) upgrade the intersection of Quia Road and Farrar Road to the satisfaction of Council;
 - h) upgrade the intersection of Quia Road and Torrens Road to the satisfaction of Council; and
 - i) upgrade Torrens Road to the satisfaction of Council.
36. Prior to carrying out any development on site, the Proponent shall prepare, and subsequently implement, a Construction Traffic Management Plan for the project to the satisfaction of the RTA and Council.
37. Within 6 months of this approval the Proponent shall enter into an agreement with Council for the maintenance of the section of the Oxley Highway between Coocooboonah Lane and Blackjack Road.
38. Prior to transporting coal from the site the Proponent shall construct 2 bus stops on the Oxley Highway to the satisfaction of Council.

3. Sunnyside Operations – 2008 to 2013

3.1 Route Upgrades and Road Maintenance Agreement

All transport route upgrades were completed, including construction of the two bus stops on Oxley Highway.

The Road Maintenance Agreement with the Gunnedah Shire Council was finalised in August 2009, and full time coal haulage commenced at the end of August 2009².

3.2 Operational Coal Transport

As required by Project Approval 06_0308, Whitehaven kept records of the amount of coal transported from the site each year, which is reported in the AEMRs. The AEMRs provide the following information on the amount of coal transported to the Whitehaven CHPP from Sunnyside, and the average number of truck loads per day from 1 December 2008 to 30 November 2012. At this time, mining works ceased, and remaining coal stockpiled on-site was transported on a campaign basis until May 2013. Coal haulage after 30 November 2012 is therefore not representative of the typical transport conditions during mining operations.

Table 3.1 summarises the coal transportation characteristics of Sunnyside during its operational phase, i.e. from 1 December 2008 to 30 November 2012.

Table 3.1: Historic Coal and Transportation to the Whitehaven CHPP

Reporting Period	Coal Transported to CHPP (tonnes)	Average Loads per Day	Average Traffic Movements per Day
1 December 2008 to 30 November 2009	89,725	62	124
1 December 2009 to 30 November 2010	279,720	19	38
1 December 2010 to 30 November 2011	361,485	32	64
1 December 2011 to 30 November 2012	517,453	81	162
Average		48.5	97

Table 3.1 indicates the average number of truck loads transported per day has been below the 125 loads per day (using only 28t payload articulated trucks) or 88 loads per day (using only 44t payload B-Doubles) assumed in the Traffic and Transport Assessment (Constructive Solutions, 2007). Coal haulage was undertaken by both B-Doubles and articulated trucks.

3.3 Transport Code of Conduct

Drivers operating the coal transportation trucks between Sunnyside and the CHPP are required to undergo induction, and operate in accordance with the relevant health and safety management system.

² The Sunnyside Annual Environmental Management Report (AEMR) for 2009/2010 states approval was received from RTA and Council to commence haulage prior to the upgrade of the intersections of Oxley Highway with Coocooboonah Lane, and with Blackjack Road.

3.4 Environmental Management – Complaints Records

An Environmental Management Strategy for Sunnyside was approved by the Director-General in October 2008, and includes (but is not limited to) procedures to receive, handle, respond to and record complaints. Sunnyside operates a complaints hotline for the receipt of complaints from the public. Complaints received are also reported in the AEMRs, and those which are related to traffic or transportation aspects of the operations are described below with the action taken by Whitehaven.

Between 2009 and 2013 there were four traffic-related complaints, as described below.

The complaint records indicate that the complaints raised generally related to driver behaviour and that Whitehaven acted to mitigate those issues through additional driver training. This response is in accordance with Toll's (the haulage contractor at the time) Risk Assessment standard for hauling coal, which identifies toolbox talks to address specific or identified issues regarding hazards.

- 17 August 2009: Complaint via Gunnedah Shire Council that coal trucks were pushing loose gravel onto Oxley Highway at the intersection with Coocooboonah Lane (this occurred prior to upgrading of the intersection in accordance with the Project Approval). Whitehaven organised for a street sweeper to remove the gravel on the day of the complaint, and arrangements were made to continue regular street sweeping until upgrading of the intersection was completed.
- 9 June 2010: Complaint via Community Consultative Committee that Toll trucks were cornering too quickly at the intersection of Coocooboonah Lane with Oxley Highway, resulting in the trucks not remaining within the dedicated acceleration lane. This was referred to Toll's HSE Compliance Officer, who raised the matter at the next toolbox talk and advised Whitehaven.
- 22 December 2010: Complaint to Sunnyside Project Manager from a resident of Blackjack Road near Oxley Highway regarding truck noise, including from a specific coal haulage truck, whose driver was excessively using exhaust brakes and failing to stop/give way. The Toll Project Manager addressed the matters with all drivers and the specific driver regarding the requirements to obey road rules and limit use of exhaust brakes.
- 15 January 2013: Complaint to Whitehaven CHPP Office regarding a specific coal transport truck using excessive exhaust braking at the intersection of Blackjack Road and Oxley Highway. The truck was confirmed by Toll as a contract operator and the driver instructed not to use exhaust braking.

4. Road Network – 2008 to 2013

4.1 Road Safety

Crash data was obtained from Roads and Maritime Services for the period from 1 January 2009 to 31 December 2013, which covers the operational period of Sunnyside, noting that full time haulage of coal commenced at the end of August 2009.

The data is based on crashes reported to Police, and included the area to the west of Gunnedah including Oxley Highway between Gunnedah and Marys Mount Road, and the area lying between Oxley Highway and the railway. This area covers the roads used to travel to and from Sunnyside. The crash data and map is presented in **Appendix A**.

The data indicates that over the four year period, there were four crashes reported along the coal haulage route.

No crashes involved vehicles associated with Sunnyside, and no crashes occurred at the intersections or locations which were upgraded under Project Approval 06_0308.

The four crashes occurred on Oxley Highway, and are summarised below:

- ID 674717 Wednesday 1 July 2009 at 1.00pm. A four wheel drive travelling westbound on Oxley Highway 8km west of town left the carriageway on a straight section in fine weather on a dry road surface and struck a fence. Fatigue was nominated as a contributing factor to this crash.
- ID 762533 Monday 1 August 2011 at 10.00am. A light truck travelling westbound on Oxley Highway overtook and struck a westbound semitrailer which was turning right into a property (8334 Oxley Hwy). This occurred in fine weather on a dry road surface.
- ID 781845 Tuesday 24 January 2012 at 10.30am. A wagon turning right into the Waterways Wildlife Park struck a wagon travelling eastbound on Oxley Highway. This occurred in fine weather on a dry road surface.
- ID 845980 Tuesday 30 July 2013 at 6.57pm. A car travelling westbound on Oxley Highway 2km west of Blackjack Road struck a kangaroo. This occurred in fine weather on a dry road surface.

The four crashes do not display any particular relationship, nor any particular location with a concentration of crashes which might indicate an inherent issue with the road. One crash involved heavy vehicles (762533) and would appear to be the result of error on the part of one or other of the drivers, as one vehicle attempted to overtake (on the right) a vehicle which was turning right into a property.

In addition to the above, three crashes occurred along Quia Road, although none occurred on the section of Quia Road used for coal haulage, and none occurred during the period that full-time haulage of coal from Sunnyside occurred.

4.2 Level of Service

The Austroads (2013) *Guide to Traffic Management Part 3: Traffic Studies and Analysis* provides guidelines for the capacity and Levels of Service (LOS) of two lane, two way rural roads, which in turn, refers to the *Highway Capacity Manual (HCM)* (Transportation Research Board, 2010).

Level of Service (LOS) is defined as a qualitative measure describing the operational conditions within a traffic stream as perceived by drivers and/or passengers. A LOS definition generally describes these conditions in terms of factors such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort, convenience and safety. LOS A provides the best traffic conditions, with no restriction on desired travel speed or overtaking. LOS B to D describes progressively worse traffic conditions. LOS E occurs when traffic conditions are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre in the traffic stream. The service flow rate for LOS E is taken as the capacity of a lane or roadway. The capacity of a road is defined as the maximum hourly rate at which vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under the prevailing roadway, traffic and control conditions. The capacity of a two-lane highway under base conditions is 1,700 pc/h in one direction, with a limit of 3,200 pc/h for the total of the two directions.

The LOS experienced by drivers on two way rural roads is dependent on the drivers' expectations regarding the road, and three classes of road are defined in HCM (2010). Class I are roads on which motorists expect to travel at relatively high speeds. They most often serve long-distance trips or provide connecting links between facilities that serve long-distance trips. Class II roads are those on which motorists do not necessarily expect to travel at high speeds, and may function as access routes to Class I facilities, serve as scenic or recreational routes or pass through rugged terrain. Class III roads serve moderately developed areas, and may be portions of a Class I or Class II highway that pass through small towns or developed recreational areas, where local traffic mixes with through traffic, and the density of unsignalised roadside access points increases.

The LOS for Class I roads is defined in terms of both percent-time-spent-following (PTSF) and average travel speed. On Class II roads, LOS is defined only in terms of PTSF. The PTSF is a measure of the level of opportunities to overtake, and is estimated from the demand traffic volumes, the directional distribution of that traffic, and the percentage of no-passing zones. The Average Travel Speed (ATS) is calculated as the average travel speed in each direction of travel. It is estimated by taking into consideration the demand traffic volumes, the percentage of no-passing zones, the geometry of the road, e.g., lane and shoulder widths, number of access points along the road, and grades. The LOS for Class III roads is defined in terms of the percent of free-flow speed (PFFS) which represents the ability of vehicles to travel at or near the posted speed limit.

As an arterial road performing a regional function, Oxley Highway would be considered a Class I road, while the remaining roads serving Sunnyside would generally be considered Class II roads. The LOS criteria for Class I, Class II and Class III two-lane roads are as shown in Table 4.1.

Table 4.1: Level of Service Criteria for Two Lane Roads

Level of Service	Class I Roads		Class II Roads	Class III Roads
	Percent-Time-Spent-Following	Average Travel Speed (km/h)	Percent-Time-Spent-Following	Percent of Free Flow Speed
A	≤ 35	> 90	≤ 40	>91.7
B	> 35-50	> 80-90	> 40-55	>83.3-91.7
C	> 50-65	> 70-80	> 55-70	>75.0-83.3
D	> 65-80	> 60-70	> 70-85	>66.7-75.0
E	>80	≤ 60	≥ 85	≤ 66.7

HCM (2010) presents detailed methodologies for determining PTSF, ATS and PFFS, however also presents basic relationships between flow rate, ATS and directional traffic volumes, and also between PTSF and directional traffic volumes.

These relationships present ranges of traffic flows for the values of PTSF defining the thresholds for Levels of Service A and B on Class I and Class II two way two lane roads as shown in Table 4.2. A range is presented because the Level of Service is impacted by the volume of traffic travelling in the opposite direction, which inhibits a driver's ability to overtake.

Table 4.2: One Directional Flow Rates (pc/h) for Level of Service A or B

LOS and Class	PTSF	High Opposing Flow 1,600 pc/h	Low Opposing Flow 200 pc/h
LOS A			
Class I	35	180	350
Class II	40	220	420
LOS B			
Class I	50	320	580
Class II	55	360	660

The relationships also indicate that when traffic volumes are low, ATS remains high. For a "free flow speed" of 65 miles per hour (mi/h) (equivalent to 104 km/h), ATS of 60 mi/h (96 km/h) will be maintained for a directional flow (one way) of over 800 pc/h.

Table 4.3 presents estimated two way peak hourly volumes at each location based on the typical relationship that peak hour traffic is in the range of 8 to 12 percent of daily traffic volumes, and adjusted to passenger car equivalent units to take account of the contribution of heavy vehicles to traffic conditions. The table compares these peak hour volumes with the volumes ranges for which the Level of Service would be A.

Table 4.3: Comparison of Volumes with PTSF Volume Ranges with Sunnyside Operational 2008-2013

Road and Location	Two Way Daily Volume (veh/h) ^A	Two Way Peak Hour Volume (pc/h)	Class	One Way Peak Hour Volume Range for LOS A (pc/h)
Coal Haulage Route				
Coocooboonah Lane North of Oxley Highway	305	25 to 40	II	220 to 420
Oxley Highway East of Coocooboonah Lane	2,012	170 to 250	I	180 to 350
Blackjack Road North of Oxley Highway	531	45 to 70	II	220 to 420
Quia Road East of Blackjack Road	1,186	100 to 150	II	220 to 420
Torrens Road West of Quia Road	281	25 to 40	II	220 to 420
Other Routes				
Oxley Highway West of Coocooboonah Lane	1,730	140 to 215	I	180 to 350
Oxley Highway East of Blackjack Road	1,754	145 to 215	I	180 to 350

^A average day using articulated trucks (28 t payload) to transport coal at maximum approved extraction rate of 1 Mtpa

While detailed information is not available regarding the directional split of traffic on the routes during peak hours, it is clear that the two way peak hour volumes are well below the peak hour volume thresholds in Table 4.2 for Level of Service A with regard to PTSF. Similarly, directional flows are well below 800 pc/h on Oxley Highway, thus ATS would remain high, and well within the range for LOS A.

The Levels of Service on these roads with Sunnyside operating would therefore be expected to be A (best) during the peak hours, with drivers having little or no restriction on their desired travel speed or overtaking.

5. Road Network – 2014

5.1 Traffic Volumes

Gunnedah Shire Council collects traffic volume data from roads within the shire. The most recently available data on roads of relevance to Sunnyside has been provided to GTA by Council's Survey and Design Officer, and is presented in Table 5.3. The reported surveyed average daily traffic volumes, percent heavy vehicles and AADT are presented in Table 5.1.

Table 5.1: Surveyed Daily Traffic August-September 2014 (vehicles per day)

Road and Location	Number of Days	Average Daily Traffic	Percent Heavy Vehicles	AADT
Blackjack Road North of Oxley Highway	21	460	26.5	538
Blackjack Road North of AgQuip	21	435	29.7	514
Quia Road East of Blackjack Road	13	1,181	11.7	1,366
Quia Road East of Torrens Road	18.1	709	14.1	853

It should be noted that the percent heavy vehicle data provided in Table 5.1 is not comparable to the percent heavy vehicle data presented by Constructive Solutions (2007), due to different allocations of vehicle classifications to the light and heavy components of the total traffic.

During the time of these surveys, Whitehaven was operating trucks along Blackjack Road, hauling rejects from Whitehaven's other operations (e.g. Tarrawonga Coal Mine) from the CHPP to old works at Melville, in accordance with the CHPP consent. This haulage is conducted only periodically, and so the surveyed volumes are likely to be higher than would typically be expected on Blackjack Road and Quia Road. Data supplied by Whitehaven indicates that over 12 haulage days in August 2014, a total of 673 trips were made from the CHPP, carrying 18,176 t of reject material. Over those 12 haulage days, this represents an average of 112 heavy vehicle movements per day on Blackjack Road and Quia Road, being the laden trucks outbound from the CHPP and the returning empty trucks inbound to the CHPP. The amount of reject material transported per day over the 12 haulage days varied significantly however, and generated between 36 and 182 heavy vehicle movement per day.

The data supplied by Council shows a distinct peak in the number of Class 9 and 10 vehicles, which are six axle articulated vehicles, rigid vehicle and trailer combinations and B-Doubles. These are the vehicle types used by Whitehaven for the rejects haulage. This is demonstrated in Table 5.2 and **Appendix B**.

Table 5.2: Surveyed Average Daily Traffic by Classification August-September 2014 (vehicles per day)

Road and Location	Light Classes 1-3	Heavy Classes 9-10	All Other Heavy	Total
Blackjack Road North of Oxley Highway	338	100	22	460
Blackjack Road North of AgQuip	306	98	31	435
Quia Road East of Blackjack Road	1,039	77	61	1,177
Quia Road East of Torrens Road	610	60	40	710

Note minor differences in Total between Table 5.1 and Table 5.2 due to data rounding

The Class 9 and 10 vehicles make up a significant proportion of the total heavy vehicles surveyed. However, it is considered that the surveyed volumes (and hence AADT volumes) provided by Council overestimate typical conditions on those roads due to the campaign nature of the reject haulage captured by the surveys.

The Roads and Maritime Services (RMS) publishes traffic volume data for its permanent and temporary count locations across NSW. The latest published data for the Oxley Highway near Sunnyside is from 2004, at a station located approximately 9km west of Sunnyside. AADT is the Annual Average Daily Traffic assessed as the total volume of traffic recorded at a specific location taken over a calendar year and is divided by the number of days in that year. The RMS data is measured in axle pairs, where a typical car is represented by one axle pair, a three axle truck by one and a half axle pairs and a six axle semitrailer as three axle pairs.

The Annual Average Daily Traffic (AADT) volume on Oxley Highway west of Sunnyside was 1,448 axle pairs per day in 2004. This represents a decrease from 1,654 axle pairs per day recorded in 2001, and only slightly above the 1,412 axle pairs per day recorded in 1998. This suggests that general background traffic growth along Oxley Highway is not expected to be a significant factor influencing traffic conditions on the road network. For the purpose of this assessment, it has however been assumed that background growth above the surveyed volumes presented in Constructive Solutions (2007) has occurred on Oxley Highway at an average of 1 percent per annum.

Table 5.3 presents estimates of existing daily traffic volumes with Sunnyside not operating, based on the recent data from Council, assumed growth on Oxley Highway and negligible growth on the other local roads. As noted these are generally considered to be conservatively high, as they include transportation of rejects haulage by Whitehaven on Blackjack Road and Quia Road, and growth on Oxley Highway above that suggested by historical data. The table compares the background daily traffic volumes with those presented in Constructive Solutions (2007).

Table 5.3: Daily Traffic Volumes Sunnyside Not Operating (vehicles per day)

Road and Location	2007			2014		
	Light	Heavy	Total	Light	Heavy	Total
Coal Haulage Route						
Coocooboonah Lane North of Oxley Highway	12	3	15	12	3	15
Oxley Highway East of Coocooboonah Lane	1,250	475	1,725	1,338	508	1,846
Blackjack Road North of Oxley Highway	200	75	275	396	142	538
Quia Road East of Blackjack Road	732	198	930	1,206	160	1,366
Torrens Road West of Quia Road	20	5	25	20	5	25
Other Routes						
Oxley Highway West of Coocooboonah Lane	1,250	475	1,725	1,338	508	1,846
Oxley Highway East of Blackjack Road	1,250	475	1,725	1,338	508	1,846

5.2 Haulage Route Inspection

An inspection of the road system serving Sunnyside was undertaken by GTA Consultants in July 2014. As noted, a number of upgrades to the road system were required as part of the Project Approval, and the conditions at these locations are described below.

The review focussed on the roadway conditions during daylight hours, as the coal haulage hours are generally limited to daylight hours. Photographs of the locations are presented in **Appendix C**. Where relevant, specific signs are referenced by their index code in AS1742, and these are illustrated in **Appendix D**.

5.3 Haulage Route Inspection Findings

5.3.1 Coocooboona Lane

From just north of Oxley Highway to the Sunnyside access, Coocooboona Lane has been realigned to lie parallel to and northeast of its former alignment. Between Oxley Highway and Sunnyside, it has a sealed surface with a single 3.5m wide travel lane in each direction and sealed shoulders approximately 1.0m wide. It is linemarked with edge lines and double centre lines. Beyond the mine entry, Coocooboona Lane is unsealed, and provides a dry weather only through connection to Quia Road.

Due to its recent construction, Coocooboona Lane is generally in good condition between Oxley Highway and Sunnyside.

The intersection of Coocooboona Lane with the Sunnyside access is linemarked to give priority to the vehicles turning left into the mine and left and right out of the mine. The northern approach (the unsealed section of Coocooboona Lane) to the intersection is the minor road at the intersection, so southbound vehicles must give way to vehicles exiting the mine, and vehicles continuing northbound along Coocooboona Lane must give way to vehicles exiting the mine (see Photograph 1 in Appendix C). The priority is not clear due to deterioration of the linemarkings over time, the use of non-standard lines, and the non-standard layout of the lines and signs.

The lines marked on the sealed pavement of Coocooboona Lane do not appear to meet the requirements of AS1742.2 (Clause 5.4.2) for give-way lines nor for continuity lines. They extend in a curved path between the northern edge of the Sunnyside Access Road and the northeastern edge of Coocooboona Lane (see Photograph 3 in Appendix C). Parts of this line have deteriorated and are not visible, and the line lies at an acute angle to the approaching southbound vehicles on the unsealed portion of Coocooboona Lane, which inhibits its visibility (see Photograph 2 in Appendix C). Furthermore, the "give way" sign for the approaching traffic on the unsealed part of Coocooboona Lane is set well in advance of the intersection itself, and is approximately 30m north of the "give way" line.

Sight distances at the intersection are good, however the priority is not well defined.

5.3.2 Coocooboona Lane and Oxley Highway Intersection

The intersection of Coocooboona Lane with Oxley Highway and Barlow Road comprises:

- single through lane in each direction on Oxley Highway;
- right turn lane for vehicles turning into Coocooboona Lane;
- right turn lane for vehicles turning right into Barlow Road;
- left turn acceleration lane for vehicles turning from Coocooboona Lane to Oxley Highway;
- single travel lane in each direction in Coocooboona Lane and Barlow Road; and
- "give way" signposting and linemarking for vehicles approaching from both Coocooboona Lane and Barlow Road.

Sight distances at the intersection are good, and all turn lanes are clearly marked with arrows as required. Advance signposting on Oxley Highway includes warnings of the approaching four way intersection (W2-1) and warning sign, "Trucks Turning" and "200m". This latter sign (W5-205) is no longer in use in NSW and has been superseded by a graphic trucks sign (W5-22), used to warn of the frequent movement of trucks to or from an adjoining property.

Signposting on Coocooboonah Lane on approach to the Oxley Highway intersection includes a "Reduce Speed" (G9-9) guide sign, and an advance warning sign of an approaching tee intersection (W2-3) (see Photograph 4 in Appendix C). In this regard it is noted that the intersection is not a tee intersection but a four way intersection, and that this sign should not be used on any approach controlled by stop or give way signs (AS1742.2 Clause 2.9.2.2(a)). This sign is intended for use on the through road of a four way intersection. In this case, it is not appropriate for installation on Coocooboonah Lane approaching Oxley Highway. This sign may be a remnant of the former layout of the intersection, as Coocooboonah Lane and Barlow Road intersected with Oxley Highway as a staggered pair of tee intersections rather than a cross intersection.

5.3.3 Oxley Highway

There was no specific upgrading of Oxley Highway required for Project Approval. Along the haulage route, Oxley Highway has a sealed carriageway with a single 3.6m wide travel lane in each direction and approximately 1.0m wide sealed shoulders on each side of the road. Oxley Highway was observed to generally be of a good standard (see Photograph 5 in Appendix C).

5.3.4 Oxley Highway and Blackjack Road Intersection

The intersection of Oxley Highway with Blackjack Road was upgraded and provides:

- Single through lane in each direction on Oxley Highway;
- Right turn lanes for vehicles turning into Blackjack Road both north and south;
- Left turn deceleration lanes for vehicles turning into Blackjack Road both north and south;
- Left turn acceleration lanes in Oxley Highway for vehicles turning from Blackjack Road both north and south to Oxley Highway; and
- Blackjack Road widens to two lanes southbound on the approach to the Oxley Highway.

Sight distances at the intersection are good, and all turn lanes are clearly marked with arrows as required.

At its approach to Oxley Highway, signage on Blackjack Road (southbound) includes (in approach order) advance warning of a four way intersection (W2-1), warning sign "Trucks Turning 300m", "reduce speed" (G9-9), a second advance warning of a four way intersection (W2-1) and stop sign ahead (W3-1) (see Photograph 6 in Appendix C). The second W2-1 sign is partly obscured by the "reduce speed" sign (see Photograph 7 in Appendix C). As noted, warning sign W2-1 is not intended to be used on an intersection approach controlled by stop or give way signs (AS1742.2 Clause 2.9.2.2(a)). This sign is intended for use on the through road of a four way intersection. In this case, it is not appropriate for installation on Blackjack Road approaching Oxley Highway.

5.3.5 Blackjack Road

Blackjack Road has a single travel lane in each direction, each approximately 3.5m wide with sealed shoulders which vary between approximately 0.3m and 1.0m on each side. It is linemarked with a single dashed centreline and solid edge lines. The speed limit on Blackjack Road is 100 km/h at the southern end, reducing to 80 km/h for about 1 km at the northern end.

Blackjack Road follows a straight and level alignment, and has a small number of accesses to individual properties, as well as several access gates for AgQuip traffic.

Blackjack Road was observed to generally be of a good standard.

5.3.6 Blackjack Road and Quia Road Intersection

The intersection of Blackjack Road with Quia Road was upgraded and now comprises a roundabout with a single circulating lane, a centre island with a mountable collar, and splitter islands on each approach. Advance warning signs for the roundabout (W2-7) are located on all approaches, the splitter islands are each signposted with roundabout give way signs and “keep left” signs. The centre island is signposted with unidirectional hazard markers (D4-1-3) facing each approach leg. All immediate approaches are constructed with kerbs and gutters.

The approach to Quia Road on Blackjack Road is appropriately signposted with “reduce speed” (G9-9) and advance warning of the roundabout ahead (W2-7). The approach to Blackjack Road on Quia Road from the CHPP is similarly signposted.

5.3.7 Quia Road

The section of Quia Road which was used for coal transport is a sealed road with a carriageway width of approximately 8.6m. It is linemarked with a single dashed centre line but no edge lines. The speed limit on Quia Road is 80 km/h.

Quia Road passes under the railway line with a right angle turn on the southern side of the railway. The railway underpass has a posted height clearance of 4.6m, with a sign on the southern approach indicating it is subject to flooding (G9-21-9), with flood height gauges on both approaches. The underpass is signposted with two obstruction markers (D4-5) on the southern approach and one on the northern approach, located over the northbound carriageway. It appears a second obstruction marker over the southbound carriageway has been removed (see Photograph 8 in Appendix C). Obstruction markers are not required by AS1742.2 where the clear height is 4.6m or greater (Clause 4.6.3.2(b)).

5.3.8 Quia Road and Farrar Road Intersection

The tee intersection of Quia Road and Farrar Road (signposted as Ross Road) lies on the southern side of the railway underpass and includes:

- separate left turn lane for vehicles turning from Quia Road to the railway underpass;
- single through lane in each direction on Quia Road-Farrar Road; and
- single travel lane in each direction on the railway underpass.

The left turn only lane is not marked with left turn arrows as would be expected, noting that only one lane continues through the intersection to Ross Road (see Photograph 9 in Appendix C). Traffic exiting the underpass is controlled by a “give way” sign, in combination with a narrow “stop” line marking on the road (see Photograph 10 in Appendix C). Sight distance at the intersection is good, noting that southbound vehicles approach the intersection on an upward

grade. Guide posts on either side of Quia Road near the railway underpass have been damaged or removed by passing vehicles.

An advance warning sign for the approaching tee intersection (W2-3) is appropriately posted on the northern side of the railway underpass near Torrens Road, which is visible to drivers approaching along both Quia Road and Torrens Road. A sight board (D4-4) is appropriately located opposite the terminating leg of the tee intersection.

5.3.9 Quia Road and Torrens Road Intersection

The intersection comprises a tee intersection with priority for vehicles travelling between the railway underpass (Quia Road) and Quia Road. Vehicles approaching on Torrens Road must give way to Quia Road traffic. The intersection includes:

- single travel lane in each direction in Quia Road with double centre line marking;
- single travel lane in each direction in Torrens Road, which is flared at its approach to Quia Road;
- “give way” signage and road markings for vehicles in Torrens Road;
- a raised concrete median island between the two travel lanes in Torrens Road at the intersection, signposted with “keep left” signs at either end; and
- double centre line marking in Torrens Road on its immediate approach to the intersection.

Sight distances at all approaches of the intersection are satisfactory.

It is noted that there are culvert heads on the western corner of the intersection (between the railway underpass and Torrens Road) which extend above the surrounding ground level, and are not significantly protected from the edge of the carriageway (see Photograph 11 in Appendix C). This presents a potential hazard for a vehicle which leaves the carriageway, particularly vehicles turning left from the railway underpass into Torrens Road. A safety barrier is provided on the eastern corner of the intersection to prevent vehicles leaving the carriageway when turning left from Torrens Road into Quia Road.

The railway underpass has a posted height clearance of 4.6m, with signs indicating it is subject to flooding, with flood height gauges. An advance warning sign for the curve in Quia Road and the presence of Torrens Road (W2-9) is appropriately located on the southern side of the railway underpass, due to the limited sight distance.

On its approach to Quia Road, Torrens Road is appropriately signposted with an advance warning sign for the approaching tee intersection (W2-3) and a “reduce speed” (G9-9) guide sign. A sight board (D4-4) is appropriately located opposite the terminating leg of the tee intersection.

5.3.10 Torrens Road

Torrens Road has a sealed carriageway approximately 7.0m wide, with painted edge lines and a single broken centre line, although this has faded and is not clearly visible along much of the length of Torrens Road. It has sealed shoulders approximately 1.0m wide on either side (see Photograph 12 in Appendix C)

5.4 Road Network Recommendations

The inspection of the road network found that generally the coal haulage route is in a satisfactory condition. Notwithstanding, a number of improvements are recommended to address existing non-conformances along the coal haulage route:

- 1) At the intersection of Coocooboona Lane and the Sunnyside Access Road:
 - a) replace the non-standard "give way" linemarking with standard "give way" linemarking;
 - b) relocate the "give way" sign for southbound traffic to be adjacent to the "give way" line;
 - c) install a W2-16(L) warning sign for northbound traffic in Coocooboona Lane;
 - d) paint an unbroken edge line across the closed "stub" of the former alignment of Coocooboona Lane;
 - e) repaint the double centre lines in Coocooboona Lane along the alignment of the priority movements on Coocooboona Lane-Sunnyside Access Road; and
 - f) remove remnants of previous double centre lines along the non-priority movements along Coocooboona Lane.
- 2) Remove sign (W2-3) shown in Photograph 4 on the Coocooboona Lane approach to the Oxley Highway intersection.
- 3) Replace the superseded "trucks turning" (W5-205) sign with the standard graphic W5-22 sign on the Oxley Highway approach to Coocooboona Lane.
- 4) Remove the two W2-1 signs shown in Photograph 6 and Photograph 7 on the Blackjack Road approach to the Oxley Highway intersection.
- 5) Provide standard "left turn only" arrows in the left turn lane in Quia Road for the turn to the railway underpass.
- 6) Replace the substandard "stop" road marking for southbound traffic exiting the railway underpass to Quia Road with standard "give way" linemarking.
- 7) Replace the missing D4-5 obstruction marker on the railway over Quia Road southbound.
- 8) Install a standard road safety barrier on the western corner of the intersection of Quia Road and Torrens Road between the railway underpass and Torrens Road.
- 9) Reinstate damaged roadside guide posts along the haulage route.

With the Sunnyside Coal Mine non-operational, the need for the improvements at the intersection of Coocooboona Lane and the Sunnyside Access Road (item 1 above) would be diminished, as the number of vehicles using the Sunnyside Access Road would be negligible, and the number of vehicles along Coocooboona Lane would be very low.

Whitehaven has reviewed the recommended road safety improvements at the intersection of Coocooboona Lane and the Sunnyside Access Road (item 1 above) and commits to addressing these recommendations prior to the recommencement of any coal mining and haulage at the Sunnyside Coal Mine.

The measures for items 2 to 9 are recommended regardless of the status of coal haulage from Sunnyside (i.e. these are unrelated to the Sunnyside Coal Mine or the Modification). Accordingly, in September 2014, Whitehaven notified the Gunnedah Shire Council and RMS of the road safety recommendations relating to items 2 to 9 above.

6. Impacts of the Modification

The Modification would involve the potential recommencement of mining operations at Sunnyside, and the extension of the mine life by a further period of up to five years.

Consistent with the currently approved operations, up to 1 Mtpa of coal would be transported to the Whitehaven CHPP via the currently approved haulage route. Coal haulage would be undertaken principally using B-Doubles, with a capacity of 40t per truck.

6.1 Coal Transport Trip Generation

Transportation of 1,000,000 tonnes of coal per year using B-Doubles with a capacity of 40t per truck would require 25,000 truck loads of coal to be transported from the mine to the CHPP per year. The number of loads able to be transported each per day would vary as the permitted hours for coal transportation vary between weekdays and Saturdays, and between summer weekdays and winter weekdays (Table 6.1). An average of 7 loads per operating hour would be required to transport 1 Mtpa over the available operating hours per year.

Table 6.1: Modification Coal Haulage per Year

	Summer Weekdays	Winter Weekdays	Saturdays	All Days
Haulage Days per Year	130	127	52	309
Haulage Hours per Day	13	11	9	11.5
Annual Haulage Hours	1,690	1,397	468	3,555
Average Loads per Day	91.4	77.4	63.3	80.9
Average Trips per Day	182.8	154.8	126.6	161.8

Winter weekdays excludes three days for AgQuip

Average day using B-Doubles (40 t payload) to transport coal at maximum extraction rate of 1 Mtpa

With transportation of 1 Mtpa of coal, the Modification would generate an average of 162 truck trips per operating day transporting coal from the mine to the CHPP and returning unladen. This would vary between an average of 183 trips per day on a summer weekday, 155 trips per day on a winter weekday and 127 trips per day on a Saturday.

The Constructive Solutions (2007) assessment assumed an average of 250 trips per day using 28t payload articulated vehicles or 176 trips per day using 40t capacity B-Doubles (Section 2.1). Nevertheless, the Modification would not alter the maximum permitted amount of coal to be transported from Sunnyside from that already approved. The number of truck trips per day is however expected to be lower than that assessed for the approved operations, as with the Modification, coal transportation is expected to be principally undertaken by B-Doubles.

6.2 Employee Trip Generation

The shift times and arrangements would remain unchanged with the Modification. For the purpose of this review, it is assumed that the number of employees with the Modification would be similar to that assumed for the traffic and transport assessment of the Sunnyside Project. Employees would therefore generate approximately 20 vehicle trips per day with the Modification.

As assumed in the traffic and transport assessment, it would be expected that the majority of employees would reside in Gunnedah or its immediate vicinity. On this basis, employees would contribute 15 vehicle trips per day between Sunnyside and Gunnedah, and 5 vehicle trips per day to and from the west and northwest of the site, using either Oxley Highway or Quia Road.

6.3 Other Trip Generation

When operational, Sunnyside would generate vehicles trips associated with deliveries such as fuel, and other visitors such as maintenance, management, regulatory inspectors and the like. The number of these trips would be expected to be low, and for the purpose of this review is estimated to be as assumed for the Sunnyside Project traffic and transport assessment, at 20 vehicle trips per day, of which 20 percent would be heavy vehicles.

6.4 Total Modification Traffic

Table 6.2 summarises the expected traffic volumes generated by the Modification during an average operating day.

Table 6.2: Modification Average Daily Traffic (vehicle trips per day)

Road and Location	Light Vehicles		Heavy Vehicles		Total	
	Employees	Visitors	Coal	Deliveries	Light	Heavy
Coal Haulage Route						
Coocooboonah Lane North of Oxley Highway	20	16	162	4	36	166
Oxley Highway East of Coocooboonah Lane	15	16	162	4	31	166
Blackjack Road North of Oxley Highway	0	6	162	0	6	162
Quia Road East of Blackjack Road	0	6	162	0	6	162
Torrens Road West of Quia Road	0	6	162	0	6	162
Other Routes						
Oxley Highway West of Coocooboonah Lane	5	0	0	0	5	0
Oxley Highway East of Blackjack Road	15	10	0	4	25	4

The Modification would therefore generate an average of 202 vehicle trips per day when 1 Mtpa of coal is transported to the CHPP. More than 80 percent of the generated traffic would be heavy vehicles associated with the transportation of coal to the CHPP.

Table 6.3 compares the average daily traffic volumes generated by Sunnyside as approved, with coal transport at the level during its busiest operating period (2011-12 reporting period) and with the Modification transporting 1 Mtpa of coal.

Table 6.3: Sunnyside Project and Modification Traffic Generation (vehicle trips per day)

Road and Location	Sunnyside Project Approval ^A		Sunnyside Project Operating 2011-2012 ^B		Sunnyside Modification ^C	
	Light	Heavy	Light	Heavy	Light	Heavy
Coal Haulage Route						
Coocooboonah Lane North of Oxley Highway	36	254	36	166	36	166
Oxley Highway East of Coocooboonah Lane	31	254	31	166	31	166
Blackjack Road North of Oxley Highway	6	250	6	162	6	162
Quia Road East of Blackjack Road	6	250	6	162	6	162
Torrens Road West of Quia Road	6	250	6	162	6	162
Other Routes						
Oxley Highway West of Coocooboonah Lane	5	0	5	0	5	0
Oxley Highway East of Blackjack Road	25	4	25	4	25	4

A Average weekday with semitrailers transporting 1 Mtpa ROM coal (Constructive Solutions, 2007)

B Average day 81 truck loads of coal per day 1 December 2011 to 30 November 2012

C Average operating day transporting 1 Mtpa ROM coal

Table 6.3 demonstrates that the forecast average daily traffic generated by Modification would remain well below those anticipated for the Project when approved, and the same as that experienced during the busiest period when Sunnyside was operational.

6.5 Traffic Volumes with Modification

Table 6.4 summarises the impact that the Modification traffic would be expected to have on the daily traffic volumes on the road network.

Table 6.4: Average Daily Traffic Volumes with Sunnyside Modification (vehicles per day)

Road and Location	Background 2014		Modification		Total	
	Light	Heavy	Light	Heavy	Light	Heavy
Coal Haulage Route						
Coocooboonah Lane North of Oxley Highway	12	3	36	166	48	169
Oxley Highway East of Coocooboonah Lane	1,338	508	31	166	1,369	674
Blackjack Road North of Oxley Highway	396	142	6	162	402	304
Quia Road East of Blackjack Road	1,206	160	6	162	1,212	322
Torrens Road West of Quia Road	20	5	6	162	26	167
Other Routes						
Oxley Highway West of Coocooboonah Lane	1,338	508	5	0	1,343	508
Oxley Highway East of Blackjack Road	1,338	508	25	4	1,363	512

6.6 Levels of Service Implications

The implications of the Modification on Levels of Service experienced on the key routes has been reviewed with respect to the HCM (2010) criteria described in Section 4.2. Table 6.5 presents the estimated two way peak hourly volumes based on the typical relationship that peak hour traffic is in the range of 8 to 12 percent of daily traffic volumes, and adjusted to passenger car equivalent units to take account of the contribution of heavy vehicles to traffic conditions. The table compares these peak hour volumes on an average day with the volumes ranges for which the Level of Service would be A. In this regard, it is noted that the traffic data supplied by Council suggests that the peak hourly volumes surveyed on Quia Road and Blackjack Road were between 7.5 and 8.4 percent of the daily total, and thus would lie at the lower end of the ranges presented below. Similarly, the data shows that during the peak hours, the distribution of traffic by direction does not show significant imbalances between peak and contra-peak flows, with peak direction volumes ranging between 51 and 57 percent of two way traffic.

Table 6.5: Comparison of Volumes with PTSF Volume Ranges with Modification

Road and Location	Two Way Daily Volume (veh/h) ^A	Two Way Peak Hour Volume (pc/h)	Class	One Way Peak Hour Volume Range for LOS A (pc/h)
Coal Haulage Route				
Coocooboonah Lane North of Oxley Highway	217	20 to 30	II	220 to 420
Oxley Highway East of Coocooboonah Lane	2,043	170 to 255	I	180 to 350
Blackjack Road North of Oxley Highway	706	60 to 90	II	220 to 420
Quia Road East of Blackjack Road	1,534	125 to 190	II	220 to 420
Torrens Road West of Quia Road	193	20 to 25	II	220 to 420
Other Routes				
Oxley Highway West of Coocooboonah Lane	1,851	150 to 230	I	180 to 350
Oxley Highway East of Blackjack Road	1,875	150 to 230	I	180 to 350

The results suggest that the Levels of Service experienced on the surrounding roads would continue to be good with the Modification, with two way volumes below the threshold one way volumes for Level of Service A based on PTSF.

6.7 Extension of Life of Mine

The Modification would extend the life of the mine from November 2015 until five years from the time of approval of the Modification. The Modification would therefore allow coal transportation to continue from late 2015 until approximately late 2020.

As noted, the RMS traffic data indicates that between 2001 and 2004, traffic volumes on Oxley Highway decreased from 1,654 axle pairs per day to 1,448 axle pairs per day. The 2004 volume was only slightly above the 1,412 axle pairs per day recorded in 1998. Background traffic growth is not expected to be a significant factor influencing traffic conditions on the road network, noting that the capacity of the roads are well in excess of the expected demand with the Modification. Any changes in background traffic (i.e. traffic not associated with Sunnyside) would have to be sizable to result in any perceptible decline in the level of service experienced by drivers.

6.8 Road Network Implications

The inspection of the road network suggests that there are a number of issues along the haulage route which are recommended to be rectified. With the exception of the improvements at the intersection of Coocooboonah Lane and Sunnyside Access Road, the improvements are recommended regardless of the status of coal haulage from Sunnyside (Section 5.4). With those measures completed, no additional improvements to the road network would be warranted by the Modification.

As described in Section 5.4, Whitehaven commits to addressing those issues identified as being associated with the resumption of coal haulage prior to the recommencement of coal mining and haulage. Whitehaven has also notified the relevant regulatory authorities of the other road safety recommendations that are unrelated to the Sunnyside Coal Mine.

7. Conclusion

The proposed Modification of the approved Sunnyside is expected to involve the generation of lower traffic average daily volumes along the haulage route than were originally anticipated for the Project Approval, and similar traffic volumes to those which occurred during the busiest operating period of Sunnyside.

The approved traffic generation of the Sunnyside Coal Mine represents a significant proportion of total vehicle movements along the coal haulage route, however, levels of service are good along the coal haulage route inclusive of the approved traffic from Sunnyside.

Road crash data and incident reports for Sunnyside suggest that while the Project was operating, there were no incidents involve coal haulage trucks, and no significant road safety issues generally.

For the Modification, it is expected drivers on the haulage route would continue to experience good levels of service, as the traffic volumes with the Modification would remain well below the available capacity and therefore, drivers would continue to have freedom to move at their desired speed.

A number of upgrades are recommended to address existing issues along the haulage route:

- 1) At the intersection of Coocooboonah Lane and the Sunnyside Access Road:
 - a) replace the non-standard "give way" linemarking with standard "give way" linemarking;
 - b) relocate the "give way" sign for southbound traffic to be adjacent to the "give way" line;
 - c) install a W2-16(L) warning sign for northbound traffic in Coocooboonah Lane;
 - d) paint an unbroken edge line across the closed "stub" of the former alignment of Coocooboonah Lane;
 - e) repaint the double centre lines in Coocooboonah Lane along the alignment of the priority movements on Coocooboonah Lane-Sunnyside Access Road; and
 - f) remove remnants of previous double centre lines along the non-priority movements along Coocooboonah Lane.
- 2) Remove sign W2-3 on the Coocooboonah Lane approach to the Oxley Highway intersection.
- 3) Replace the superseded "trucks turning" (W5-205) sign with the standard graphic W5-22 sign on the Oxley Highway approach to Coocooboonah Lane.
- 4) Remove the two W2-1 signs on the Blackjack Road approach to the Oxley Highway intersection.
- 5) Provide standard "left turn only" arrows in the left turn lane in Quia Road for the turn to the railway underpass.
- 6) Replace the substandard "stop" road marking for southbound traffic exiting the railway underpass to Quia Road with standard "give way" linemarking.
- 7) Replace the missing D4-5 obstruction marker on the railway over Quia Road southbound.
- 8) Install a standard road safety barrier on the western corner of the intersection of Quia Road and Torrens Road between the railway underpass and Torrens Road.
- 9) Reinstate damaged roadside guide posts along the haulage route.

Whitehaven has reviewed the recommended road safety improvements at the intersection of Coocooboonah Lane and the Sunnyside Access Road (item 1 above) and commits to addressing these recommendations prior to the recommencement of any coal mining and haulage at the Sunnyside Coal Mine.

The recommended measures for items 2 to 9 are recommended regardless of the status of coal haulage from Sunnyside (i.e. these are unrelated to the Sunnyside Coal Mine or the Modification). Accordingly, in September 2014, Whitehaven notified the Gunnedah Shire Council and RMS of the road safety recommendations relating to items 2 to 9 above.

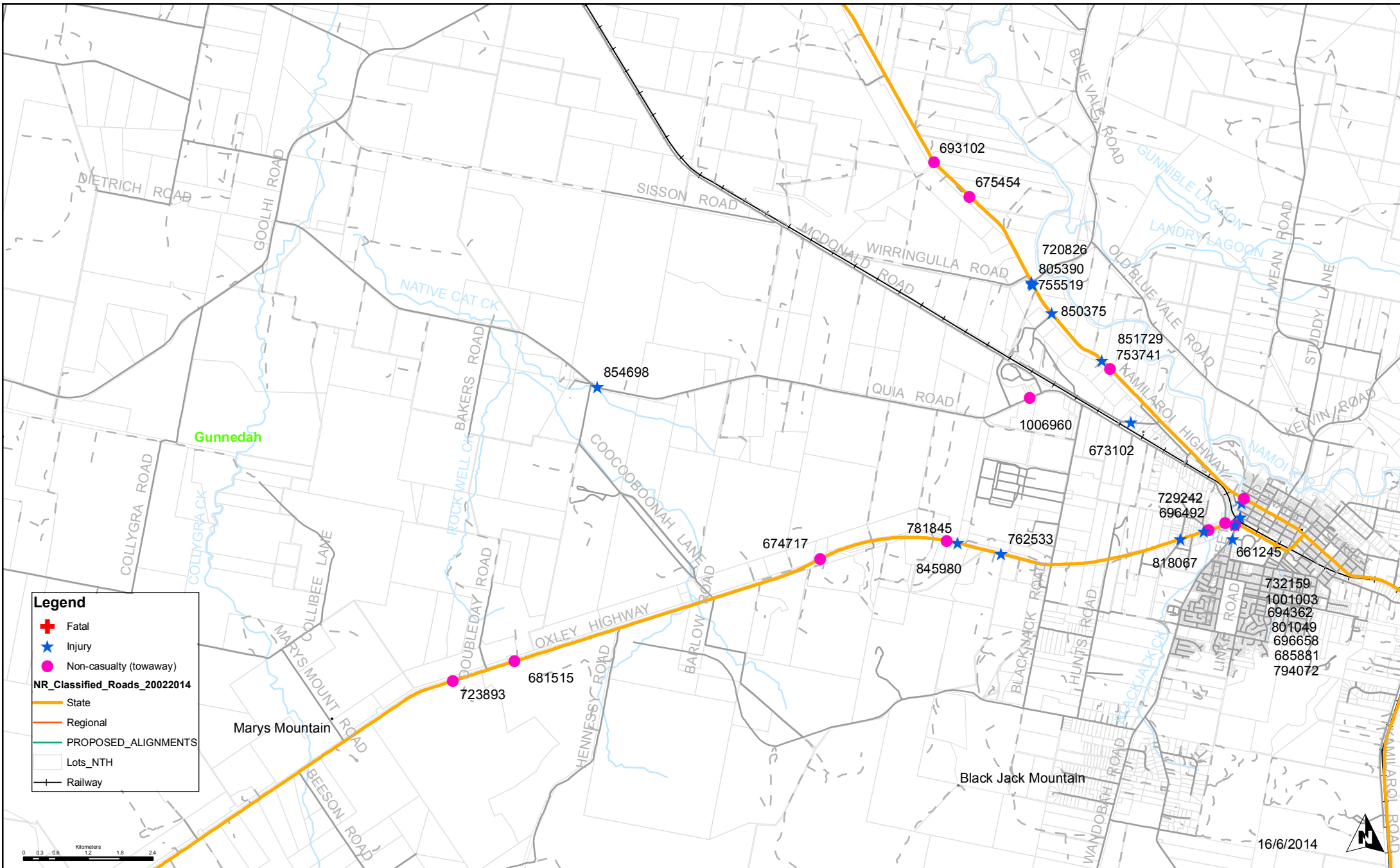
With the above measures completed, no additional improvements to the road network would be warranted by the Modification.

Therefore, the Modification would result in no significant impacts on the performance, efficiency and safety of the road network.

Appendix A

Appendix A

Road Crash Data



Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
Northern Region																				
Gunnedah LGA																				
Emerald Hill																				
Quia Rd																				
854698	01/10/2013	Tue	06:30	6.93 km	E GOOLHI RD	2WY	CRV	Fine	Dry	100	1	TRK	M19	E in QUIA RD	90	Proceeding in lane	I	0	1	S
E52599475						RUM:	87	Off lft/lft bnd=>obj				Tree/bush								
Gunnedah																				
Farrar Rd																				
685881	15/10/2009	Thu	02:00	55 m	N OXLEY HWY	2WY	CRV	Fine	Dry	50	1	CAR	M62	N in FARRAR RD	35	Proceeding in lane	N	0	0	
E38863405						RUM:	83	Off rt/rt bnd=>obj				Utility pole								
Kamilaroi Hwy																				
675454	16/07/2009	Thu	18:45	2 km	N BLUE VALE RD	2WY	STR	Fine	Dry	100	1	CAR	F41	E in KAMILAROI HWY	95	Proceeding in lane	N	0	0	
E38130438						RUM:	71	Off rd left => obj				Tree/bush								
755519	20/05/2011	Fri	13:00	2 m	S BLUE VALE RD	TJN	STR	Fine	Dry	100	2	SEM	M33	N in KAMILAROI HWY	100	Proceeding in lane	I	0	1	
E44812062						RUM:	91	Object struck veh				BDBL U U	S in KAMILAROI HWY	Unk	Proceeding in lane					
												Falling object								
805390	16/07/2012	Mon	07:40	30 m	S BLUE VALE RD	2WY	CRV	Fog or mist	Wet	100	1	SEM	M23	S in KAMILAROI HWY	55	Proceeding in lane	I	0	1	S
E48214344						RUM:	88	Out of cont on bend												
720826	09/08/2010	Mon	18:25	50 m	S BLUE VALE RD	2WY	STR	Fine	Dry	60	2	CAR	M79	S in KAMILAROI HWY	60	Proceeding in lane	I	0	1	
E41377137						RUM:	65	Temp roadworks				LOR M55	N in KAMILAROI HWY	45	Proceeding in lane					
												Roadwork equipment								
851729	25/08/2013	Sun	06:30	2 km	S BLUE VALE RD	2WY	STR	Fine	Dry	100	1	TRK	M19	S in KAMILAROI HWY	100	Proceeding in lane	I	0	1	F
E52825028						RUM:	71	Off rd left => obj				Tree/bush								
1001003	07/11/2013	Thu	14:45		at CONADILLY ST	XJN	STR	Fine	Dry	50	2	CAR	M51	N in CONADILLY ST	50	Proceeding in lane	N	0	0	
E52838623						RUM:	10	Cross traffic				UTE M27	W in KAMILAROI HWY	50	Proceeding in lane					
693102	14/12/2009	Mon	14:40	10 km	N GUNNEDAH TN	2WY	CRV	Fine	Dry	100	1	SEM	M61	N in KAMILAROI HWY	80	Proceeding in lane	N	0	0	
E39436305						RUM:	83	Off rt/rt bnd=>obj				Fence (prior to 2014)								
753741	24/05/2011	Tue	15:00		at PORTLAND GTE	2WY	STR	Fine	Dry	100	1	CAR	M72	E in KAMILAROI HWY	70	Proceeding in lane	N	0	0	F
E206117493						RUM:	73	Off rd right => obj				Drain/culvert								

Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
850375 E52185444	04/09/2013	Wed	08:30	5 km N	WARRABUNGLE ST	2WY RUM:	STR 91	Fine Object struck veh	Dry	100	2	LOR OMV	M33 U U	N in KAMILAROI HWY N in KAMILAROI HWY	Unk Proceeding in lane Unk Proceeding in lane		I	0	1	
Falling object																				
Oxley Hwy																				
845980 E52283057	30/07/2013	Tue	18:57	2 km W	BLACKJACK RD	2WY RUM:	CRV 67	Fine Struck animal	Dry	100	1	CAR Kangaroo	F28	W in OXLEY HWY	100 Proceeding in lane		N	0	0	
729242 E42562826	22/10/2010	Fri	15:30		at BORTHISTLE RD	TJN RUM:	STR 32	Raining Right rear	Wet	50	2	4WD 4WD	M38 F54	W in OXLEY HWY W in OXLEY HWY	40 Proceeding in lane 0 Wait turn right		N	0	0	
696492 E39812138	12/01/2010	Tue	15:15	100 m W	BORTHISTLE RD	2WY RUM:	STR 30	Fine Rear end	Dry	50	2	M/C TRK	M54 M46	E in OXLEY HWY E in OXLEY HWY	42 Proceeding in lane 15 Proceeding in lane		I	0	1	
674717 E37468809	01/07/2009	Wed	13:00	8 km W	GUNNEDAH TN	2WY RUM:	STR 71	Fine Off rd left => obj	Dry	100	1	4WD Fence (prior to 2014)	M54	W in OXLEY HWY	90 Proceeding in lane		N	0	0	F
818067 E426398091	15/11/2012	Thu	08:45		at MARTIN RD	XJN RUM:	STR 53	Fine Overtake turning	Dry	80	3	CAR WAG TRK	F21 M50 M51	W in OXLEY HWY W in OXLEY HWY W in OXLEY HWY	70 Pull out opposite 25 Turning right 25 Turning right		I	0	1	
762533 E187450494	01/08/2011	Mon	10:00		at NUMBER 8334 HN	2WY RUM:	STR 53	Fine Overtake turning	Dry	100	2	TRK SEM	M56 M48	W in OXLEY HWY W in OXLEY HWY	60 Pull out opposite 40 Turning right		I	0	1	
694362 E39393606	17/12/2009	Thu	10:00		at VIEW ST	RDB RUM:	CRV 10	Fine Cross traffic	Dry	50	2	TRK P/C	M55 M64	E in OXLEY HWY N in VIEW ST	25 Proceeding in lane Proceeding in lane		I	0	1	
794072 E46910420	13/04/2012	Fri	06:55		at VIEW ST	RDB RUM:	STR 10	Fine Cross traffic	Dry	50	2	TRK UTE	M39 M50	N in VIEW ST W in OXLEY HWY	15 Proceeding in lane 30 Proceeding in lane		I	0	1	
801049 E49054641	24/06/2012	Sun	08:40		at VIEW ST	RDB RUM:	STR 10	Fine Cross traffic	Dry	50	2	CAR CAR	M79 M41	N in VIEW ST W in OXLEY HWY	40 Proceeding in lane 50 Proceeding in lane		N	0	0	
781845 E46768105	24/01/2012	Tue	10:30		at WATERWAY WILDL ENT	2WY RUM:	STR 21	Fine Right through	Dry	100	2	WAG WAG	F56 F56	W in OXLEY HWY E in OXLEY HWY	15 Turning right 100 Proceeding in lane		I	0	4	
Quia Rd																				
673102 E37437505	14/05/2009	Thu	06:45	550 m W	KAMILAROI HWY	2WY RUM:	STR 69	Fine Other on path	Dry	80	1	LOR Other fixed object	M35	W in QUIA RD	15 Proceeding in lane		I	0	1	
1006960 E52755015	03/12/2013	Tue	13:50		at NUMBER 268 HN	2WY RUM:	STR 53	Fine Overtake turning	Dry	80	2	4WD LOR	M48 M26	W in QUIA RD W in QUIA RD	40 Pull out opposite 5 Turning right		N	0	0	
Railway Ave																				

Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
696658 E39338709	21/01/2010	Thu	09:10	50 m	E NEW ST	2WY	STR	Fine	Dry	50	1	M/C	M27	N in RAILWAY AVE	10	Forward from drive	I	0	1	S
View St RUM: 80 Off left/right bend																				
661245 E71321801	27/03/2009	Fri	19:00		at WANDOBAH RD	TJN	STR	Fine	Dry	50	1	P/C	M29	N in VIEW ST		Proceeding in lane	I	0	1	
Warrabungle St RUM: 74 On road-out of cont.																				
732159 E43002469	08/11/2010	Mon	18:45	20 m	N LITTLE BARBER ST	2WY	STR	Fine	Dry	50	1	M/C	M22	S in WARRABUNGLE ST	100	Proceeding in lane	I	0	1	S
Marys Mount Oxley Hwy RUM: 73 Off rd right => obj Utility pole																				
681515 E38502466	30/08/2009	Sun	12:30	500 m	E DOUBLEDAY RD	2WY	STR	Fine	Dry	100	1	TRK	F61	W in OXLEY HWY	80	Proceeding in lane	N	0	0	
RUM: 74 On road-out of cont.																				
723893 E42075666	28/08/2010	Sat	18:45	700 m	W DOUBLEDAY RD	2WY	STR	Fine	Dry	100	1	TRK	M58	E in OXLEY HWY	100	Proceeding in lane	N	0	0	
RUM: 67 Struck animal Kangaroo																				

Report Totals: Total Crashes: 28 Fatal Crashes: 0 Injury Crashes: 16 Killed: 0 Injured: 19

Crashid dataset Gunnedah, Marys Mount, Emerald Hill Crash Data 1/1/2009 to 31/12/2013p

Note: Data for the 9 month period prior to the generated date of this report are incomplete and are subject to change.

Summary Crash Report

# Crash Type		
Car Crash	13	46.4%
Light Truck Crash	9	32.1%
Rigid Truck Crash	4	14.3%
Articulated Truck Crash	4	14.3%
'Heavy Truck Crash	(8)	(28.6%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(8)	(28.6%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	3	10.7%
Pedal Cycle Crash	2	7.1%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	8	28.6%
Non intersection	20	71.4%

* Up to 10 metres from an intersection
~ 07:30-09:30 or 14:30-17:00 on school days

Collision Type		
Single Vehicle	15	53.6%
Multi Vehicle	13	46.4%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	21	75.0%
Other Classified Road	0	0.0%
Unclassified Road	7	25.0%

Contributing Factors		
Speeding	4	14.3%
Fatigue	3	10.7%
Alcohol	1	3.6%

Weather		
Fine	26	92.9%
Rain	1	3.6%
Overcast	0	0.0%
Fog or mist	1	3.6%
Other	0	0.0%

Road Surface Condition		
Wet	2	7.1%
Dry	26	92.9%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	0	0.0%
Daylight	22	78.6%
Dusk	2	7.1%
Darkness	4	14.3%

Speed Limit			~ 40km/h or less		
40 km/h or less	0	0.0%	80 km/h zone	3	10.7%
50 km/h zone	10	35.7%	90 km/h zone	0	0.0%
60 km/h zone	1	3.6%	100 km/h zone	14	50.0%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

Crash Movement		
Intersection, adjacent approaches	4	14.3%
Head-on (not overtaking)	0	0.0%
Opposing vehicles; turning	1	3.6%
U-turn	0	0.0%
Rear-end	2	7.1%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	3	10.7%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	2	7.1%
Off road, on straight	0	0.0%
Off road on straight, hit object	5	17.9%
Out of control on straight	2	7.1%
Off road, on curve	1	3.6%
Off road on curve, hit object	3	10.7%
Out of control on curve	1	3.6%
Other crash type	4	14.3%

CRASHES			28
Fatal crash	0	0.0%	
Injury crash	16	57.1%	
Non-casualty crash	12	42.9%	

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Time Group		% of Day	
00:01 - 02:59	1	3.6%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	4	14.3%	4.2%
07:00 - 07:59	1	3.6%	4.2%
08:00 - 08:59	3	10.7%	4.2%
09:00 - 09:59	1	3.6%	4.2%
10:00 - 10:59	3	10.7%	4.2%
11:00 - 11:59	0	0.0%	4.2%
12:00 - 12:59	1	3.6%	4.2%
13:00 - 13:59	3	10.7%	4.2%
14:00 - 14:59	2	7.1%	4.2%
15:00 - 15:59	3	10.7%	4.2%
16:00 - 16:59	0	0.0%	4.2%
17:00 - 17:59	0	0.0%	4.2%
18:00 - 18:59	5	17.9%	4.2%
19:00 - 19:59	1	3.6%	4.2%
20:00 - 21:59	0	0.0%	8.3%
22:00 - 24:00	0	0.0%	8.3%

Street Lighting Off/Nil		% of Dark	
4	of	4 in Dark	100.0%

CASUALTIES			19
Killed	0	0.0%	
Injured	19	100.0%	
^ Unrestrained	1	5.3%	

Crashes		Casualties
6	2013	3
5	2012	7
3	2011	2
6	2010	4
8	2009	3

~ School Travel Time		
Involvement	7	25.0%

McLean Periods		% Week	
A	6	21.4%	17.9%
B	2	7.1%	7.1%
C	9	32.1%	17.9%
D	0	0.0%	3.5%
E	1	3.6%	3.6%
F	5	17.9%	10.7%
G	3	10.7%	7.1%
H	1	3.6%	7.1%
I	1	3.6%	12.5%
J	0	0.0%	10.7%

Day of the Week			# Holiday Periods														
Monday	5	17.9%	Thursday	7	25.0%	Sunday	3	10.7%	New Year	0	0.0%	Queen's BD	0	0.0%	Easter SH	1	3.6%
Tuesday	6	21.4%	Friday	4	14.3%	WEEKDAY	24	85.7%	Aust. Day	0	0.0%	Labour Day	0	0.0%	June/July SH	1	3.6%
Wednesday	2	7.1%	Saturday	1	3.6%	WEEKEND	4	14.3%	Easter	0	0.0%	Christmas	0	0.0%	Sept./Oct. SH	2	7.1%
									Anzac Day	0	0.0%	January SH	3	10.7%	December SH	0	0.0%

Crashid dataset Gunnedah, Marys Mount, Emerald Hill Crash Data 1/1/2009 to 31/12/2013p

Note: Data for the 9 month period prior to the generated date of this report are incomplete and are subject to change.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Appendix B

Shire of Gunnedah Traffic Data



Traffic Count Report



Location: Blackjack Rd (North of Oxley Highway)

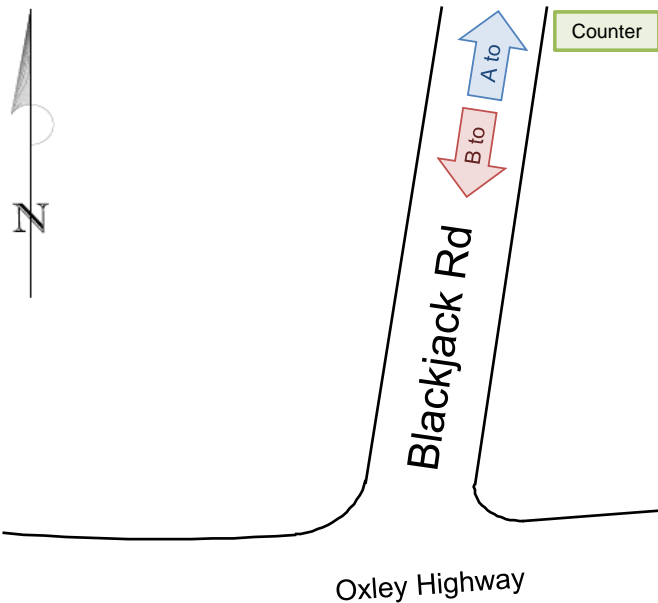
Period: Thu 28-Aug-2014 10:00am to Thu 18-Sep-2014 09:00am

Created: 18-Sep-2014 02:13pm

Counter Days: 21

Class Summary

Class	1	2	3	4	5	6	7	8	9	10	11	12	Totals
Direction A to B	2733	166	440	122	25	10	17	23	896	133	1	0	4566
Direction B to A	3022	178	566	144	44	15	22	32	912	162	5	0	5102
All Directions	5755	344	1006	266	69	25	39	55	1808	295	6	0	9668



Vehicle Summary

Type	A to B	B to A	Total
Light	3339	3766	7105
Heavy	1227	1336	2563
Hvy %	26.9%	26.2%	26.5%

Peak Hour		85% Speed
Time	8:00	86.0
Volume	63	

AADT	ADT
538.1	460.4

Hour Summary

Direction	Light Vehicles				Heavy Vehicles				All Vehicles					
	A to B		B to A		A to B		B to A		A to B		B to A		Both Directions	
	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
0000-0100	23	1.10	11	0.52	9	0.43	2	0.10	32	1.52	13	0.62	45	2.14
0100-0200	4	0.19	9	0.43	6	0.29	3	0.14	10	0.48	12	0.57	22	1.05
0200-0300	5	0.24	8	0.38	2	0.10	0	0.00	7	0.33	8	0.38	15	0.71
0300-0400	8	0.38	19	0.90	1	0.05	1	0.05	9	0.43	20	0.95	29	1.38
0400-0500	61	2.90	16	0.76	0	0.00	19	0.90	61	2.90	35	1.67	96	4.57
0500-0600	213	10.14	35	1.67	8	0.38	22	1.05	221	10.52	57	2.71	278	13.24
0600-0700	191	9.10	140	6.67	14	0.67	53	2.52	205	9.76	193	9.19	398	18.95
0700-0800	213	10.14	199	9.48	90	4.29	131	6.24	303	14.43	330	15.71	633	30.14
0800-0900	234	11.14	258	12.29	130	6.19	134	6.38	364	17.33	392	18.67	756	36.00
0900-1000	224	10.67	264	12.57	140	6.67	144	6.86	364	17.33	408	19.43	772	36.76
1000-1100	235	11.19	302	14.38	122	5.81	149	7.10	357	17.00	451	21.48	808	38.48
1100-1200	237	11.29	293	13.95	124	5.90	124	5.90	361	17.19	417	19.86	778	37.05
1200-1300	180	8.57	252	12.00	97	4.62	119	5.67	277	13.19	371	17.67	648	30.86
1300-1400	210	10.00	221	10.52	107	5.10	114	5.43	317	15.10	335	15.95	652	31.05
1400-1500	226	10.76	312	14.86	112	5.33	115	5.48	338	16.10	427	20.33	765	36.43
1500-1600	245	11.67	301	14.33	107	5.10	106	5.05	352	16.76	407	19.38	759	36.14
1600-1700	259	12.33	295	14.05	65	3.10	51	2.43	324	15.43	346	16.48	670	31.90
1700-1800	214	10.19	348	16.57	24	1.14	12	0.57	238	11.33	360	17.14	598	28.48
1800-1900	123	5.86	209	9.95	23	1.10	11	0.52	146	6.95	220	10.48	366	17.43
1900-2000	76	3.62	113	5.38	11	0.52	8	0.38	87	4.14	121	5.76	208	9.90
2000-2100	72	3.43	67	3.19	14	0.67	8	0.38	86	4.10	75	3.57	161	7.67
2100-2200	47	2.24	44	2.10	11	0.52	7	0.33	58	2.76	51	2.43	109	5.19
2200-2300	21	1.00	36	1.71	7	0.33	1	0.05	28	1.33	37	1.76	65	3.10
2300-2400	18	0.86	14	0.67	3	0.14	2	0.10	21	1.00	16	0.76	37	1.76
Totals	3339	159.00	3766	179.33	1227	58.43	1336	63.62	4566	217.43	5102	242.95	9668	460.38

Traffic Count Report



Location: Blackjack Rd (North of AgQuip)

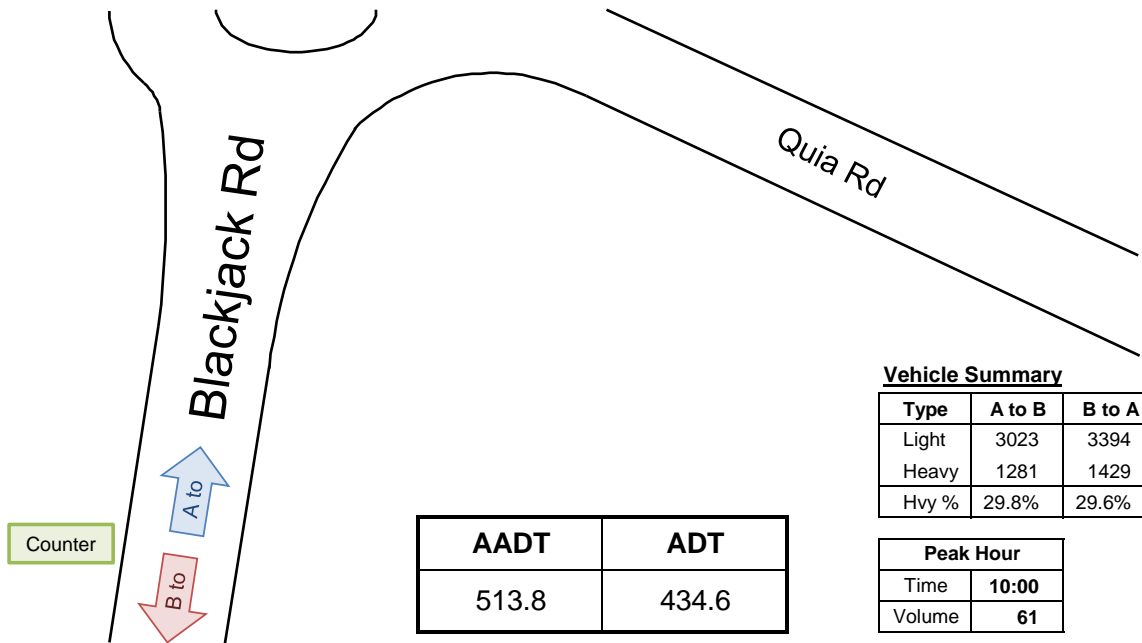
Period: Thu 28-Aug-2014 10:00am to Thu 18-Sep-2014 09:00am

Created: 18-Sep-2014 02:13pm

Counter Days: 21

Class Summary

Class	1	2	3	4	5	6	7	8	9	10	11	12	Totals
Direction A to B	2435	143	445	149	23	8	23	92	857	127	2	0	4304
Direction B to A	2698	157	539	238	40	9	27	33	923	154	5	0	4823
All Directions	5133	300	984	387	63	17	50	125	1780	281	7	0	9127



Vehicle Summary

Type	A to B	B to A	Total
Light	3023	3394	6417
Heavy	1281	1429	2710
Hvy %	29.8%	29.6%	29.7%

Peak Hour	
Time	10:00
Volume	61

85% Speed
84.6

Hour Summary

Direction	Light Vehicles				Heavy Vehicles				All Vehicles				Both Directions	
	A to B		B to A		A to B		B to A		A to B		B to A			
	Hours	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total
0000-0100	20	0.95	9	0.43	8	0.38	1	0.05	28	1.33	10	0.48	38	1.81
0100-0200	3	0.14	10	0.48	5	0.24	3	0.14	8	0.38	13	0.62	21	1.00
0200-0300	3	0.14	6	0.29	2	0.10	0	0.00	5	0.24	6	0.29	11	0.52
0300-0400	6	0.29	17	0.81	1	0.05	1	0.05	7	0.33	18	0.86	25	1.19
0400-0500	57	2.71	10	0.48	0	0.00	20	0.95	57	2.71	30	1.43	87	4.14
0500-0600	200	9.52	40	1.90	24	1.14	15	0.71	224	10.67	55	2.62	279	13.29
0600-0700	176	8.38	186	8.86	54	2.57	24	1.14	230	10.95	210	10.00	440	20.95
0700-0800	198	9.43	185	8.81	92	4.38	133	6.33	290	13.81	318	15.14	608	28.95
0800-0900	228	10.86	221	10.52	135	6.43	139	6.62	363	17.29	360	17.14	723	34.43
0900-1000	204	9.71	236	11.24	149	7.10	156	7.43	353	16.81	392	18.67	745	35.48
1000-1100	219	10.43	262	12.48	123	5.86	156	7.43	342	16.29	418	19.90	760	36.19
1100-1200	190	9.05	244	11.62	123	5.86	137	6.52	313	14.90	381	18.14	694	33.05
1200-1300	198	9.43	236	11.24	103	4.90	123	5.86	301	14.33	359	17.10	660	31.43
1300-1400	183	8.71	208	9.90	108	5.14	124	5.90	291	13.86	332	15.81	623	29.67
1400-1500	193	9.19	258	12.29	107	5.10	124	5.90	300	14.29	382	18.19	682	32.48
1500-1600	236	11.24	263	12.52	103	4.90	126	6.00	339	16.14	389	18.52	728	34.67
1600-1700	249	11.86	264	12.57	59	2.81	67	3.19	308	14.67	331	15.76	639	30.43
1700-1800	193	9.19	308	14.67	23	1.10	17	0.81	216	10.29	325	15.48	541	25.76
1800-1900	115	5.48	186	8.86	20	0.95	22	1.05	135	6.43	208	9.90	343	16.33
1900-2000	49	2.33	96	4.57	8	0.38	21	1.00	57	2.71	117	5.57	174	8.29
2000-2100	41	1.95	57	2.71	14	0.67	6	0.29	55	2.62	63	3.00	118	5.62
2100-2200	33	1.57	38	1.81	11	0.52	8	0.38	44	2.10	46	2.19	90	4.29
2200-2300	17	0.81	39	1.86	7	0.33	1	0.05	24	1.14	40	1.90	64	3.05
2300-2400	12	0.57	15	0.71	2	0.10	5	0.24	14	0.67	20	0.95	34	1.62
	3023	143.95	3394	161.62	1281	61.00	1429	68.05	4304	204.95	4823	229.67	9127	434.62



Traffic Count Report



Location: Quia Rd (East of Blackjack Rd)

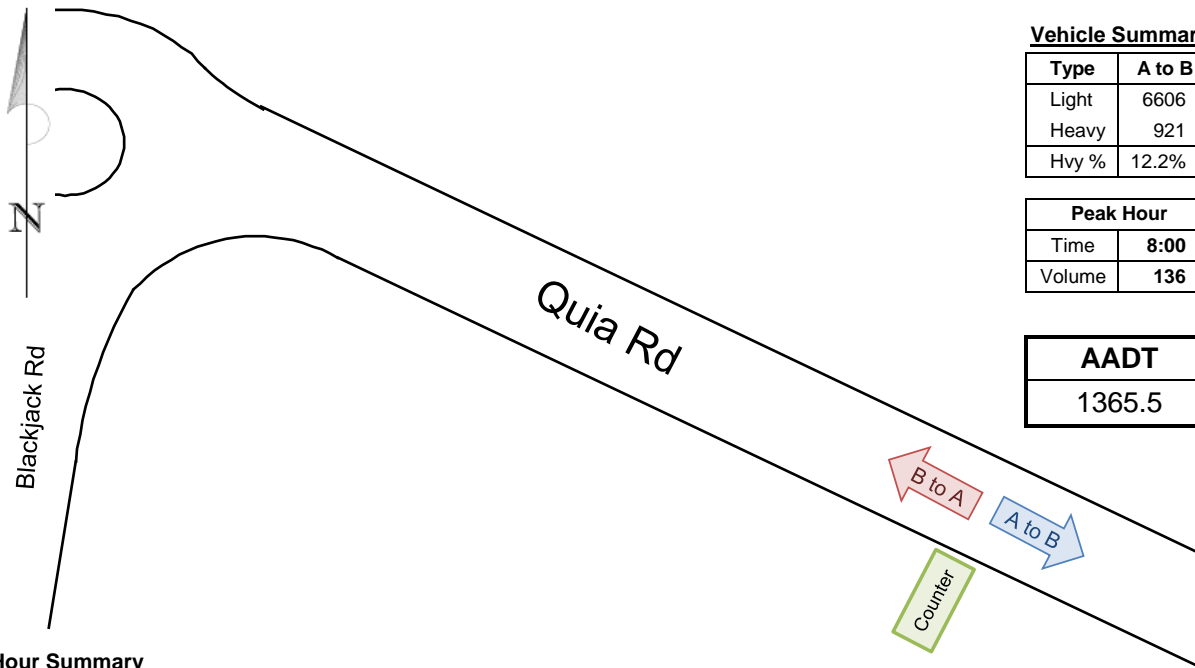
Period: Fri 05-Sep-2014 12:00pm to Thu 18-Sep-2014 10:00am

Created: 18-Sep-2014 02:17pm

Counter Days: 13

Class Summary

Class	1	2	3	4	5	6	7	8	9	10	11	12	Totals
Direction A to B	5544	426	636	274	59	14	23	29	375	147	0	0	7527
Direction B to A	5948	445	510	284	64	6	18	20	335	140	0	1	7771
All Directions	11492	871	1146	558	123	20	41	49	710	287	0	1	15298



Vehicle Summary

Type	A to B	B to A	Total
Light	6606	6903	13509
Heavy	921	868	1789
Hvy %	12.2%	11.2%	11.7%

Peak Hour		85% Speed
Time	8:00	87.0
Volume	136	

AADT	ADT
1365.5	1180.6

Hour Summary

Direction	Light Vehicles				Heavy Vehicles				All Vehicles				Both Directions	
	A to B		B to A		A to B		B to A		A to B		B to A			
	Hours	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total
0000-0100	11	0.85	10	0.77	2	0.15	6	0.46	13	1.00	16	1.23	29	2.23
0100-0200	9	0.69	14	1.08	7	0.54	2	0.15	16	1.23	16	1.23	32	2.46
0200-0300	3	0.23	10	0.77	4	0.31	2	0.15	7	0.54	12	0.92	19	1.46
0300-0400	18	1.38	32	2.46	3	0.23	0	0.00	21	1.62	32	2.46	53	4.08
0400-0500	48	3.69	30	2.31	0	0.00	13	1.00	48	3.69	43	3.31	91	7.00
0500-0600	182	14.00	346	26.62	13	1.00	13	1.00	195	15.00	359	27.62	554	42.62
0600-0700	277	21.31	340	26.15	46	3.54	68	5.23	323	24.85	408	31.38	731	56.23
0700-0800	358	27.54	432	33.23	54	4.15	53	4.08	412	31.69	485	37.31	897	69.00
0800-0900	665	51.15	483	37.15	73	5.62	69	5.31	738	56.77	552	42.46	1290	99.23
0900-1000	503	38.69	490	37.69	91	7.00	74	5.69	594	45.69	564	43.38	1158	89.08
1000-1100	485	37.31	460	35.38	63	4.85	72	5.54	548	42.15	532	40.92	1080	83.08
1100-1200	470	39.17	447	37.25	48	4.00	60	5.00	518	43.17	507	42.25	1025	85.42
1200-1300	435	33.46	463	35.62	63	4.85	61	4.69	498	38.31	524	40.31	1022	78.62
1300-1400	529	40.69	465	35.77	66	5.08	82	6.31	595	45.77	547	42.08	1142	87.85
1400-1500	534	41.08	457	35.15	86	6.62	81	6.23	620	47.69	538	41.38	1158	89.08
1500-1600	531	40.85	503	38.69	82	6.31	65	5.00	613	47.15	568	43.69	1181	90.85
1600-1700	515	39.62	490	37.69	96	7.38	42	3.23	611	47.00	532	40.92	1143	87.92
1700-1800	491	37.77	553	42.54	49	3.77	25	1.92	540	41.54	578	44.46	1118	86.00
1800-1900	291	22.38	355	27.31	18	1.38	20	1.54	309	23.77	375	28.85	684	52.62
1900-2000	97	7.46	213	16.38	14	1.08	28	2.15	111	8.54	241	18.54	352	27.08
2000-2100	49	3.77	126	9.69	19	1.46	9	0.69	68	5.23	135	10.38	203	15.62
2100-2200	57	4.38	86	6.62	14	1.08	13	1.00	71	5.46	99	7.62	170	13.08
2200-2300	27	2.08	64	4.92	7	0.54	4	0.31	34	2.62	68	5.23	102	7.85
2300-2400	21	1.62	34	2.62	3	0.23	6	0.46	24	1.85	40	3.08	64	4.92
	6606	511.17	6903	533.87	921	71.15	868	67.15	7527	582.32	7771	601.02	15298	1183.34



Traffic Count Report



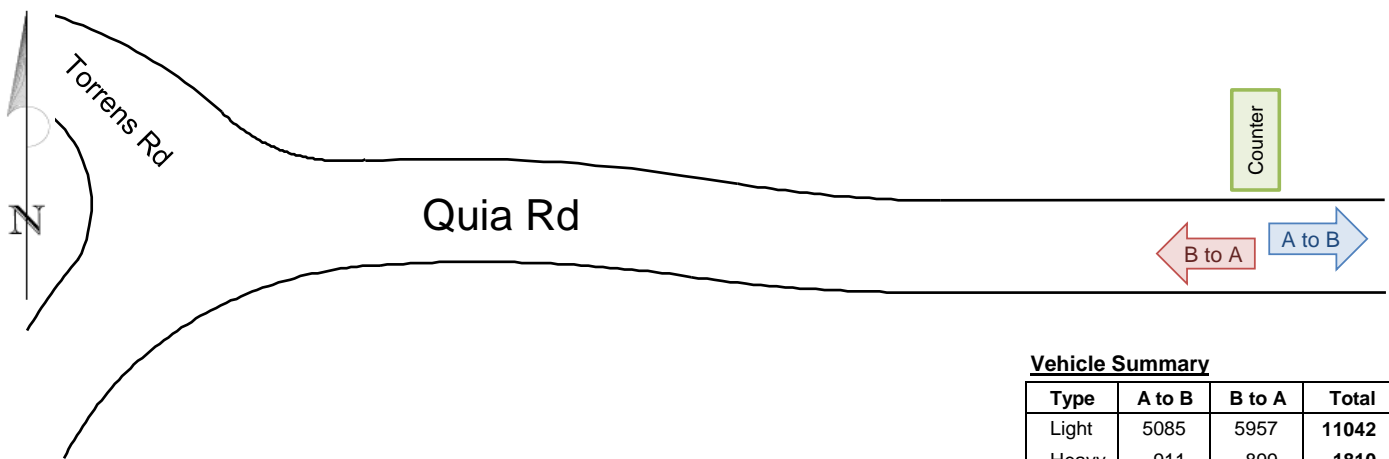
Location: Quia Rd (East of Torrens Rd)

Period: Thu 28-Aug-2014 10:00am to Mon 15-Sep-2014 12:00pm

Created: 19-Sep-2014 08:50am **Counter Days:** 18.1

Class Summary

Class	1	2	3	4	5	6	7	8	9	10	11	12	Totals
Direction A to B	4209	226	650	221	49	14	43	34	396	154	0	0	5996
Direction B to A	5293	223	441	228	70	6	22	33	349	188	3	0	6856
All Directions	9502	449	1091	449	119	20	65	67	745	342	3	0	12852



Vehicle Summary

Type	A to B	B to A	Total
Light	5085	5957	11042
Heavy	911	899	1810
Hvy %	15.2%	13.1%	14.1%

AADT	ADT
853.1	709.1

Peak Hour		85% Speed 74.0
Time	14:00	
Volume	86	

Hour Summary

Direction Hours	Light Vehicles				Heavy Vehicles				All Vehicles					
	A to B		B to A		A to B		B to A		A to B		B to A		Both Directions	
	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
0000-0100	7	0.39	13	0.72	5	0.28	9	0.50	12	0.67	22	1.22	34	1.89
0100-0200	8	0.44	10	0.56	9	0.50	3	0.17	17	0.94	13	0.72	30	1.67
0200-0300	2	0.11	4	0.22	5	0.28	2	0.11	7	0.39	6	0.33	13	0.72
0300-0400	6	0.33	27	1.50	3	0.17	1	0.06	9	0.50	28	1.56	37	2.06
0400-0500	62	3.44	27	1.50	14	0.78	18	1.00	76	4.22	45	2.50	121	6.72
0500-0600	212	11.78	283	15.72	43	2.39	34	1.89	255	14.17	317	17.61	572	31.78
0600-0700	265	14.72	302	16.78	100	5.56	23	1.28	365	20.28	325	18.06	690	38.33
0700-0800	303	16.83	359	19.94	55	3.06	53	2.94	358	19.89	412	22.89	770	42.78
0800-0900	387	21.50	436	24.22	59	3.28	66	3.67	446	24.78	502	27.89	948	52.67
0900-1000	387	21.50	416	23.11	83	4.61	67	3.72	470	26.11	483	26.83	953	52.94
1000-1100	399	21.00	420	22.11	72	3.79	75	3.95	471	24.79	495	26.05	966	50.84
1100-1200	389	20.47	433	22.79	56	2.95	76	4.00	445	23.42	509	26.79	954	50.21
1200-1300	340	17.89	410	21.58	61	3.21	63	3.32	401	21.11	473	24.89	874	46.00
1300-1400	375	20.83	386	21.44	58	3.22	82	4.56	433	24.06	468	26.00	901	50.06
1400-1500	387	21.50	385	21.39	52	2.89	72	4.00	439	24.39	457	25.39	896	49.78
1500-1600	387	21.50	407	22.61	67	3.72	64	3.56	454	25.22	471	26.17	925	51.39
1600-1700	358	19.89	440	24.44	47	2.61	50	2.78	405	22.50	490	27.22	895	49.72
1700-1800	381	21.17	477	26.50	29	1.61	52	2.89	410	22.78	529	29.39	939	52.17
1800-1900	240	13.33	312	17.33	29	1.61	31	1.72	269	14.94	343	19.06	612	34.00
1900-2000	92	5.11	174	9.67	19	1.06	23	1.28	111	6.17	197	10.94	308	17.11
2000-2100	40	2.22	108	6.00	17	0.94	11	0.61	57	3.17	119	6.61	176	9.78
2100-2200	35	1.94	55	3.06	17	0.94	16	0.89	52	2.89	71	3.94	123	6.83
2200-2300	15	0.83	53	2.94	9	0.50	3	0.17	24	1.33	56	3.11	80	4.44
2300-2400	8	0.44	20	1.11	2	0.11	5	0.28	10	0.56	25	1.39	35	1.94
	5085	279.20	5957	327.25	911	50.06	899	49.32	5996	329.26	6856	376.57	12852	705.83

Appendix C

Road Network Observations

Observations of the road conditions were undertaken on 12 and 13 July 2014.

Photograph 1: Approaching Sunnyside Access Intersection from Coccooboonah Lane Southbound



Give way sign approximately 25-30m in advance of intersection and no visible give way line for traffic approaching from Coccooboonah Lane southbound.

Photograph 2: Exiting from Sunnyside onto Coccooboonah Lane



Poor road surface and non-standard line marking in poor condition.

Photograph 3: Intersection of Coccooboonah Lane and Sunnyside Access Looking East



Poor road surface and non-standard line marking. Double centre lines on Coccooboonah Lane through the intersection have been removed but remain visible.

Photograph 4: Approaching Oxley Highway Intersection on Coocooboonah Lane



Incorrect use of warning sign for approaching tee intersection at a four way intersection.

Photograph 5: Approaching Coochoonah Lane on Oxley Highway from Gunnedah



Note use of superseded "TRUCKS TURNING" sign.

Photograph 6: Approaching Oxley Highway on Blackjack Road



Incorrect use of sign warning of four way intersection on the minor road, and one additional sign obscured by the "Reduce Speed" guide sign.

Photograph 7: Approaching Oxley Highway on Blackjack Road



Incorrect use of sign warning of approaching four way intersection on the minor road, and sign obscured on approach.

Photograph 8: West Along Quia Road to Railway Underpass



Obstruction marker missing over westbound travel lane – not required by Standard, but one provided over eastbound travel lane.

Photograph 9: West Along Quia Road from Farrar Road (Ross Road) Intersection



Non-standard "stop" line and no left turn arrows on left only lane.

Photograph 10: West Along Quia Road from East of Farrar Road (Ross Road) Intersection



Conflicting non-standard "stop" line and "give way" sign on Quia Road.

Photograph 11: Intersection of Quia Road and Torrens Road



Note two unprotected culvert headwalls close to the edge of the carriageway.

Photograph 12: West Along Torrens Road to CHPP Gates



Appendix D

Signage Information



Warning sign W2-1



Warning sign W2-3



Warning sign W2-7



Warning sign W3-1



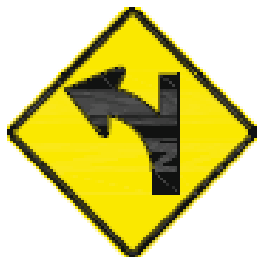
Warning sign W3-2



Warning sign W5-22



Warning sign W2-9(R)



Warning sign W2-16(L)



Guide sign G9-9



Unidirectional hazard marker D4-1-3



Sight board D4-4



Guide sign G9-21-9



Obstruction marker D4-5

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