Tarrawonga Coal Project

Environmental Assessment

APPENDIX H

ROAD TRANSPORT ASSESSMENT

Resource Strategies

Tarrawonga Coal Pty Ltd

Tarrawonga Coal Project

Road Transport Assessment

24 October 2011

Prepared for

Tarrawonga Coal Pty Ltd

Halcrow

Tarrawonga Coal Project
Road Transport Assessment

Prepared for
Tarrawonga Coal Pty Ltd

This report has been issued and amended as follows:

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1 Introduction

This report has been prepared on behalf of Tarrawonga Coal Pty Ltd (TCPL) to present the results of an assessment of the road transport implications of a proposal to continue and extend operations at the Tarrawonga Coal Mine (TCM) and to increase annual run-of-mine (ROM) coal production from 2.0 million tonnes per annum (Mtpa) up to 3.0Mtpa. The proposed development is known as the Tarrawonga Coal Project (the Project).

This study has been undertaken with reference to the road transport components of the Director General's environmental assessment requirements for this Project, which require:

> ***Traffic and Transport*** *– including:*
> - *accurate predictions of the road and rail (if any) traffic of the project;*
> - *a detailed assessment of the potential impacts of this traffic on the capacity, efficiency and safety of the road (and if necessary rail) network; and*
> - *plans of the proposed road re-alignments;*

The rail components of the Director General's environmental assessment requirements are addressed separately in the Main Report of the Environmental Assessment and in the Noise and Blasting Impact Assessment (Wilkinson Murray, 2011) presented in Appendix C of the Environmental Assessment.

In addition, the issues raised by the New South Wales Roads and Traffic Authority (RTA) in their letter to the Department of Planning (dated 11 April 2011) have been considered and addressed during the preparation of this assessment.

The assessment has been prepared in accordance with the *Guide to Traffic Generating Developments* (RTA, 2002), and where relevant, makes reference to the RTA's (1996) *Road Design Guide* and Austroads standards.

An appreciation of the existing traffic situation around the TCM can be gained by examining the existing road network, traffic volumes on the existing road network, traffic generated by the existing transport activity at the TCM, observed growth in background traffic, and safety aspects of the road system. These aspects are discussed in this report, along with potential impacts from the Project.

The remainder of the report is set out as follows:

- Section 2 describes the existing and proposed operating characteristics of the TCM.
- Section 3 describes the existing road transport conditions on the road system around the TCM.
- Section 4 assesses the potential impacts of the Project including consideration of the Project in the context of cumulative traffic growth.
- Section 5 presents the conclusions of the investigation.

2 Existing and Proposed Coal Mine Operations

2.1 Existing Operations at the Tarrawonga Coal Mine

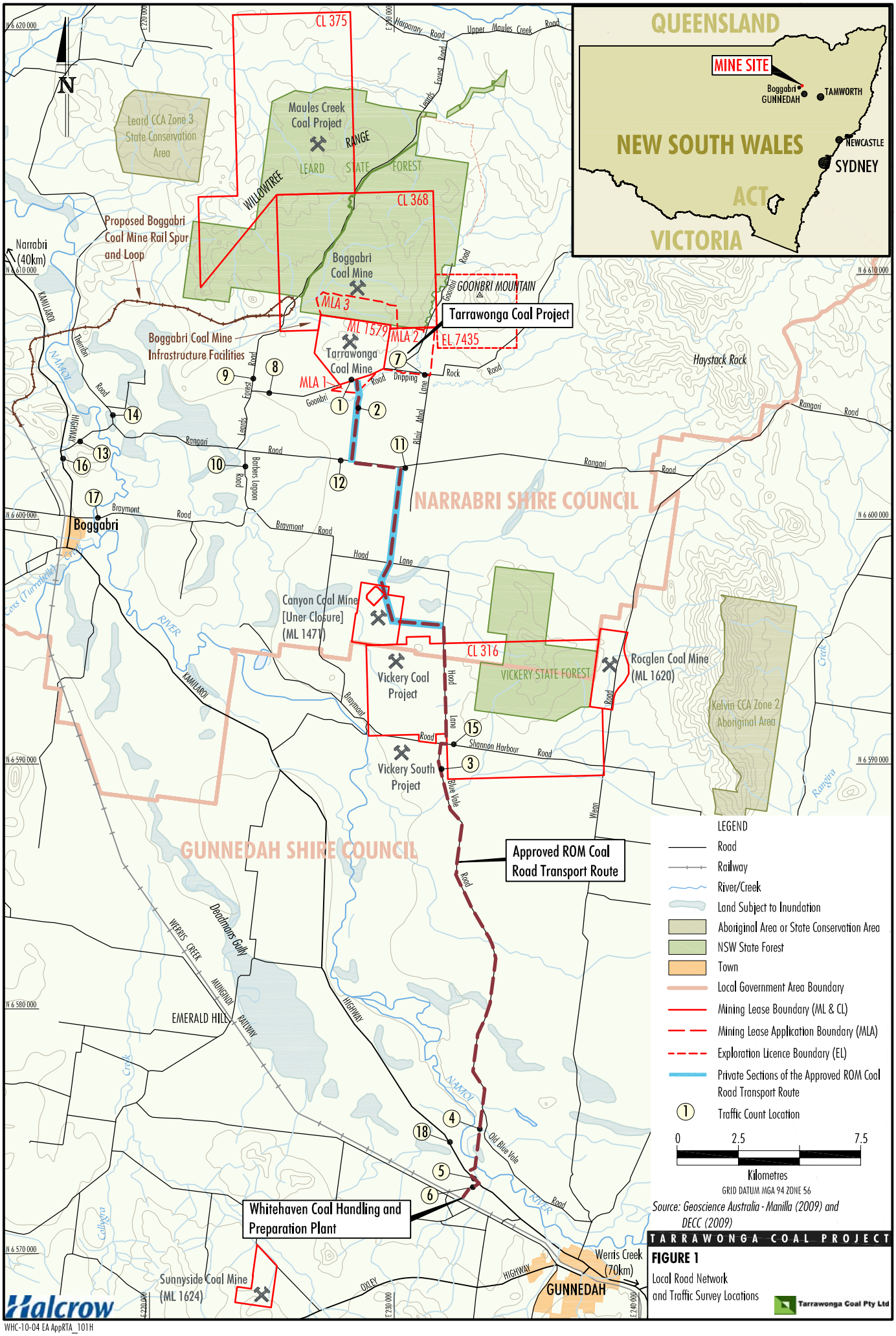
The TCM is owned and operated by TCPL, which is a joint venture between Whitehaven Coal Mining Pty Ltd (Whitehaven) (70% interest) and Boggabri Coal Pty Ltd (a wholly-owned subsidiary of Idemitsu Australia Resources Pty Ltd) (30% interest). It is located approximately 15 kilometres (km) north-east of Boggabri and 42km north-northwest of Gunnedah in New South Wales. The location of the TCM in its regional context is shown on **Figure 1** of this report. Vehicular site access to the TCM is via Goonbri Road as shown in **Figure 1**.

Conventional open cut truck and shovel mining methods are used at the TCM. Open cut mining and material handling at the TCM is currently undertaken during the following approved hours of operation:

- Monday to Friday from 7.00am to 3.30am the following morning (i.e. 20.5 hours per 24 hour period); and
- Saturday from 7.00am to 6.00pm.

ROM coal is crushed and screened on-site and then transported via the approved ROM coal road transport route (haul route) (refer to **Figure 1**) to the Whitehaven Coal Handling and Preparation Plant (CHPP), which is located approximately 35km to the south on the outskirts of Gunnedah. At the CHPP, the sized ROM coal is further crushed, screened and washed or bypassed before being loaded onto trains for despatch and sale.

Sized ROM coal despatch from the TCM occurs between 7.00am and 9.15pm Monday to Friday, and 7.00am and 5.15pm Saturdays, excluding public holidays. The approved haul route between the TCM and the CHPP (refer to **Figure 1**) includes a combination of public and private roads and provides the shortest and least trafficked route between the TCM and the CHPP. The haul route was constructed in 2006 in accordance with the approved *Transport Route Construction Management Plan for the East Boggabri Coal Mine* (TCPL, 2005).



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The TCM is located within Narrabri Shire Council, about 10km north of its boundary with Gunnedah Shire Council. The haul route from the TCM to the CHPP includes sections in the Narrabri Shire Council and Gunnedah Shire Council areas.

TCPL and Whitehaven have entered into road maintenance agreements with the Narrabri Shire Council and Gunnedah Shire Council. The road maintenance agreement with Narrabri Shire Council covers the section of the haul route within the Narrabri Shire, and requires the road and intersections to be maintained in good condition at all times at TCPL's cost. Maintenance requirements are determined through joint inspections carried out every four months.

The road maintenance agreement with Gunnedah Shire Council covers the maintenance of roads used by Whitehaven in association with the TCM as well as other Whitehaven mines and facilities in the region, e.g., the CHPP at Gunnedah, Canyon Coal Mine (under closure), and Rocglen Coal Mine. Under this agreement, Whitehaven is required to pay 95% of road maintenance costs incurred by Gunnedah Shire Council for Hoad Lane and Blue Vale Road. The maintenance requirements are determined through an annual joint inspection.

2.1.1 Workforce

The existing TCM workforce of 86 full time on-site personnel, including on-site contractors, functions on a shift basis, as follows:

- 6.30am to 6.30pm – 24% of total workforce;
- 7.00am to 5.00pm – 38% of total workforce; and
- 4.30pm to 2.30am – 38% of total workforce.

Employees travel to and from the TCM by car, and TCPL has advised a typical occupancy of 1.2 employees per vehicle. The 86 employees arriving and leaving at the start and end of shifts would thus typically generate some 144 light vehicle trips per day (vehicle trips/day). A trip is a one way movement, so an employee's vehicle arriving and departing generates two vehicle trips.

The workforce is primarily drawn from the local area around Gunnedah, Boggabri, Manilla and Narrabri. TCPL has provided the following information on the distribution of the source of the existing employees at the TCM, based on a survey conducted in December 2010:

- Gunnedah 54%;
- Boggabri 21%;
- Narrabri 13%;
- Manilla 9%; and
- Other 3%.

The survey identified the approach and departure routes used by employees travelling to and from the TCM, which are summarised in Table 2.1.

Table 2.1 – Distribution of Employee Trips to and from TCM (percent)

Source and Route	Approach to TCM	Depart from TCM
Gunnedah		
Haul Route	54%	54%
Boggabri		
Kamilaroi Hwy-Rangari Rd-Leards Forest Rd-Goonbri Rd	5%	5%
Kamilaroi Hwy-Rangari Rd-Haul Route	10%	7%
Braymont Rd-Barbers Lagoon Rd-Rangari Rd-Haul Route	6%	6%
Braymont Rd-Barbers Lagoon Rd-Rangari Rd-Leards Forest Rd-Goonbri Rd	0%	3%
Manilla		
Rangari Rd-Haul Route	9%	9%
Narrabri		
Kamilaroi Hwy-Rangari Rd-Haul Route	6%	6%
Kamilaroi Hwy-Rangari Rd-Leards Forest Rd-Goonbri Rd	7%	7%
Other		
Goonbri Rd	1%	1%
Dripping Rock Rd	1%	1%
Rangari Rd-Haul Route	1%	1%
Total	100%	100%

2.1.2 Deliveries and Visitors

A review of the site log book for a typical week in late 2010 indicates that there were 233 deliveries and visitors during the week, of which 15% (35 deliveries) were made by heavy vehicles. Over the week, deliveries and visitors therefore generated some 396 light vehicle trips and 70 heavy vehicle trips. The heavy vehicles include rigid trucks, semi-trailers and B-doubles.

Deliveries and visitor trips are spread evenly throughout the day, generally between 6.00am and 6.00pm, and generally approach and depart the TCM from and to the following locations:

- Gunnedah 80%;
- Boggabri 10%; and
- Narrabri 10%.

Delivery and visitor vehicles to and from Gunnedah would use the haul route, while those travelling to and from Boggabri and Narrabri are assumed to use Kamilaroi Highway, Rangari Road and the haul route to access the TCM.

It is conservatively estimated that 20% of delivery and visitor trips may occur on the average weekday. In reality, these would be spread throughout the week, including Saturdays, with day-to-day random variations.

2.1.3 Sized ROM Coal Haulage

The TCM produces sized ROM coal that is transported by a haulage contractor utilising a fleet of on-highway haulage trucks (e.g. B-Doubles) from the TCM to the CHPP for export. In addition, domestic specification coal is collected from the TCM by domestic customers. The maximum transport rate for sized ROM coal is 2Mtpa, and for domestic specification coal is 450,000 tonnes per annum [tpa]. The maximum amount of ROM coal produced from the TCM is 2Mtpa however, so the combined maximum ROM coal transport rate is 2Mtpa.

As noted in Section 2.1, sized ROM coal is transported by road from the TCM to the CHPP, making use of an approved haul route (refer to **Figure 1**), which is a combination of public and private roads.

During the 2009-2010 Annual Environmental Management Report reporting period, i.e., April 2009 to May 2010, sized ROM coal production at the TCM was 1.69 million tonnes (Mt), and sized ROM coal haulage generated an average of 132 trucks per coal haulage day, or 264 truck trips per coal haulage day (TCPL, 2010).

On a pro-rata basis, the existing maximum production of 2Mtpa would be expected to generate 156 trucks per coal haulage day, or 312 truck trips per coal haulage day. This is verified by data collected at the TCM over one week from 30 November to 6 December 2010, which shows that 940 trucks were despatched from the TCM over that week. This is equivalent to an average of 157 trucks per coal haulage day during that week.

Sized ROM coal despatch occurs between 7.00am and 9.15pm Monday to Friday, and 7.00am and 5.15pm Saturdays (excluding public holidays), and is spread evenly over these periods. It is noted that the last load is despatched from the TCM at 9.15pm Monday to Friday and at 5.15pm on Saturdays. These trucks arrive at the CHPP by 10.00pm Monday to Friday and by 6.00pm Saturdays.

2.1.4 Domestic Specification Coal Haulage

Domestic specification coal is sold direct from the TCM to customers, who arrange collection from the site. At the maximum transport rate for domestic specification coal, i.e., 450,000tpa, 36 trucks collect coal from the TCM per coal haulage day. This generates some 72 truck trips on the road network.

During 2010, domestic specification coal despatch was much lower than 450,000tpa and it is estimated that an average of seven trucks per coal haulage day collected coal from the TCM, generating 14 truck trips per coal haulage day on the road network. These trucks depart evenly between 7.00am and 9.15pm Monday to Friday, and between 7.00am and 5.15pm on Saturdays (excluding public holidays). The key destinations for this coal are typically:

- Sydney 36%;
- Tamworth 35%;
- Gunnedah 16%; and
- Narrabri 13%.

Trucks collecting domestic specification coal use the approved haul route when arriving at and departing from the TCM.

It is noted that although the vehicle movements associated with the collection of domestic specification coal are related to the TCM, they are not operated by TCPL or TCPL contractors. Therefore, these trucks do not form part of the TCPL's operations.

2.1.5 Total TCM Traffic Generation and Distribution

Based upon the typical weekly and daily traffic characteristics described above, the typical average daily traffic generation of the TCM and its distribution on the surrounding road network is summarised in Table 2.2.

Table 2.2 demonstrates that the traffic generated by the TCM is generally concentrated along the haul route between the TCM and the CHPP, with TCM daily volumes on other roads in the surrounding region being very low, at up to about 60 vehicles per day. Heavy vehicles associated with the TCM are concentrated on the haul route.

Table 2.2 – Average Weekday Traffic Generated by TCM in 2010 (vehicles/day)

Site[A]	Road and Location	Employees	Delivery and Visitor	Sized ROM Coal	Domestic Specification Coal[B]	Total	Percent Heavy Vehicle
	Haul Route						
1	TCM Access Rd	144	94	312	14	564	60.3%
2	Haul Route south of Goonbri Rd	121	94	312	14	541	62.9%
3	Blue Vale Rd south of Shannon Harbour Rd	78	76	312	14	480	70.3%
4	Blue Vale Rd northeast of Kamilaroi Hwy	78	76	312	14	480	70.3%
5	Kamilaroi Hwy btwn Blue Vale Rd and CHPP	78	76	312	12	478	70.2%
6	CHPP Access Rd	0	0	312	0	312	100.0%
	Other Locations						
7	Dripping Rock Rd east of Goonbri Rd	2	0	0	0	2	0.0%
8	Goonbri Rd east of Leards Forest Rd	20	0	0	0	20	0.0%
9	Leards Forest Rd north of Goonbri Rd	0	0	0	0	0	0.0%
10	Barbers Lagoon Rd south of Rangari Rd	10	0	0	0	10	0.0%
11	Rangari Rd east of Haul Route	12	0	0	0	12	0.0%
12	Rangari Rd west of Haul Route	30	18	0	0	48	5.6%
13	Rangari Rd east of Kamilaroi Hwy	38	18	0	0	56	4.8%
14	Therribri Rd north of Rangari Rd	0	0	0	0	0	0.0%
15	Shannon Harbour Rd east of Blue Vale Rd	0	0	0	0	0	0.0%
16	Kamilaroi Hwy south of Rangari Rd	20	10	0	2	32	10.9%
17	Braymont Rd at Namoi River Bridge	10	0	0	0	10	0.0%
18	Kamilaroi Hwy north of Blue Vale Rd	0	0	0	2	2	100.0%

[A] Refer to Figure 1; [B] Not operated by TCPL or TCPL contractors

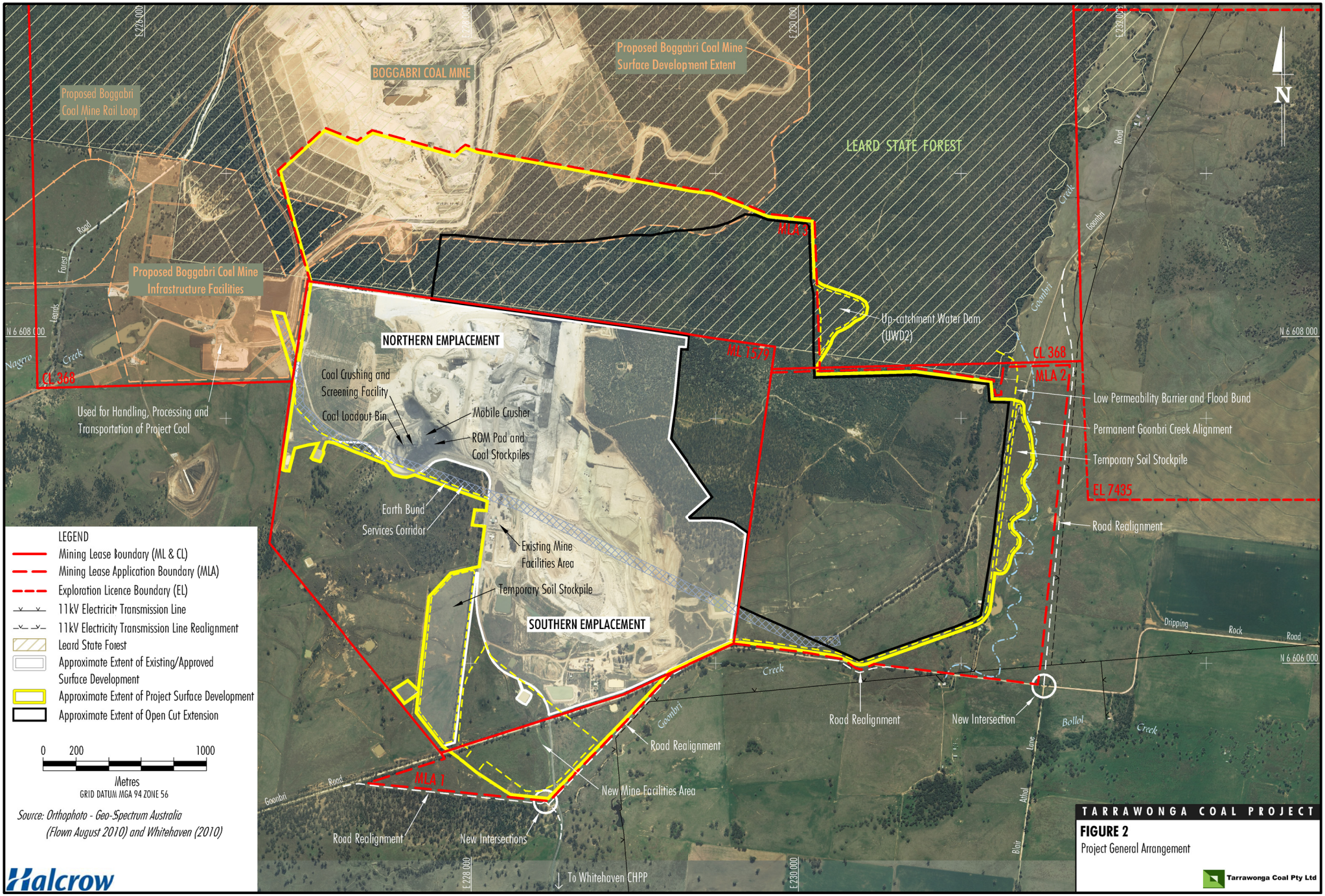
2.2 The Proposed Project

2.2.1 Project Description

The main activities associated with the development of the Project would include (refer to **Figure 2**):

- continued development of mining operations in the Maules Creek Formation to facilitate a Project ROM coal production rate of up to 3Mtpa, including open cut extensions:
  - to the east within Mining Lease (ML) 1579 and Mining Lease Application (MLA) 2; and
  - to the north within Coal Lease (CL) 368 (MLA 3) which adjoins ML 1579;
- ongoing exploration activities;
- construction and use of a services corridor (including haul road link) directly from the Project open cut mining operation to the upgraded Boggabri Coal Mine Infrastructure Facilities[1];
- use of upgraded Boggabri Coal Mine Infrastructure Facilities for the handling and processing of Project coal and the loading of Project product coal to trains for transport on the Boggabri Coal Mine private rail spur to the Werris Creek Mungindi Railway[1];
- construction and use of a new mine facilities area including relocation of existing mine facilities infrastructure and service facilities;
- use of an existing on-site mobile crusher for coal crushing and screening of up to 150,000 tonnes (t) of domestic specification coal per annum for direct collection by customers at the mine site;
- use an existing on-site mobile crusher to produce up to approximately 90,000 cubic metres (m^3) of gravel materials per annum for direct collection by customers at the mine site;
- progressive backfilling of the mine void behind the advancing open cut mining operation with waste rock and minor quantities of coarse reject material;
- continued and expanded placement of waste rock in the Northern Emplacement (including integration with the Boggabri Coal Mine emplacement) and Southern Emplacement, as mining develops;

[1] Subject to approvals and upgrades being in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities.



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- progressive development of new haul roads and internal roads, as mining develops;
- realignment of sections of Goonbri Road and construction of new intersections;
- construction of an engineered low permeability barrier to the east and south-east of the open cut to reduce the potential for local drainage of alluvial groundwater into the open cut;
- removal of a section of Goonbri Creek within the Project open cut and the establishment of a permanent Goonbri Creek alignment and associated flood bund to the east and south-east of the open cut;
- progressive development of sediment basins and storage dams, pumps, pipelines and other water management equipment and structures;
- continued development of soil stockpiles, laydown areas and gravel/borrow areas;
- ongoing monitoring and rehabilitation; and
- other associated minor infrastructure, plant, equipment and activities.

An indicative layout of the new mine facilities area, including the internal road network and parking facilities, is shown on **Figure 3**.

The proposed life of the Project is 17 years, commencing 1 January 2013.

2.2.2 Road Transport Aspects of the Project

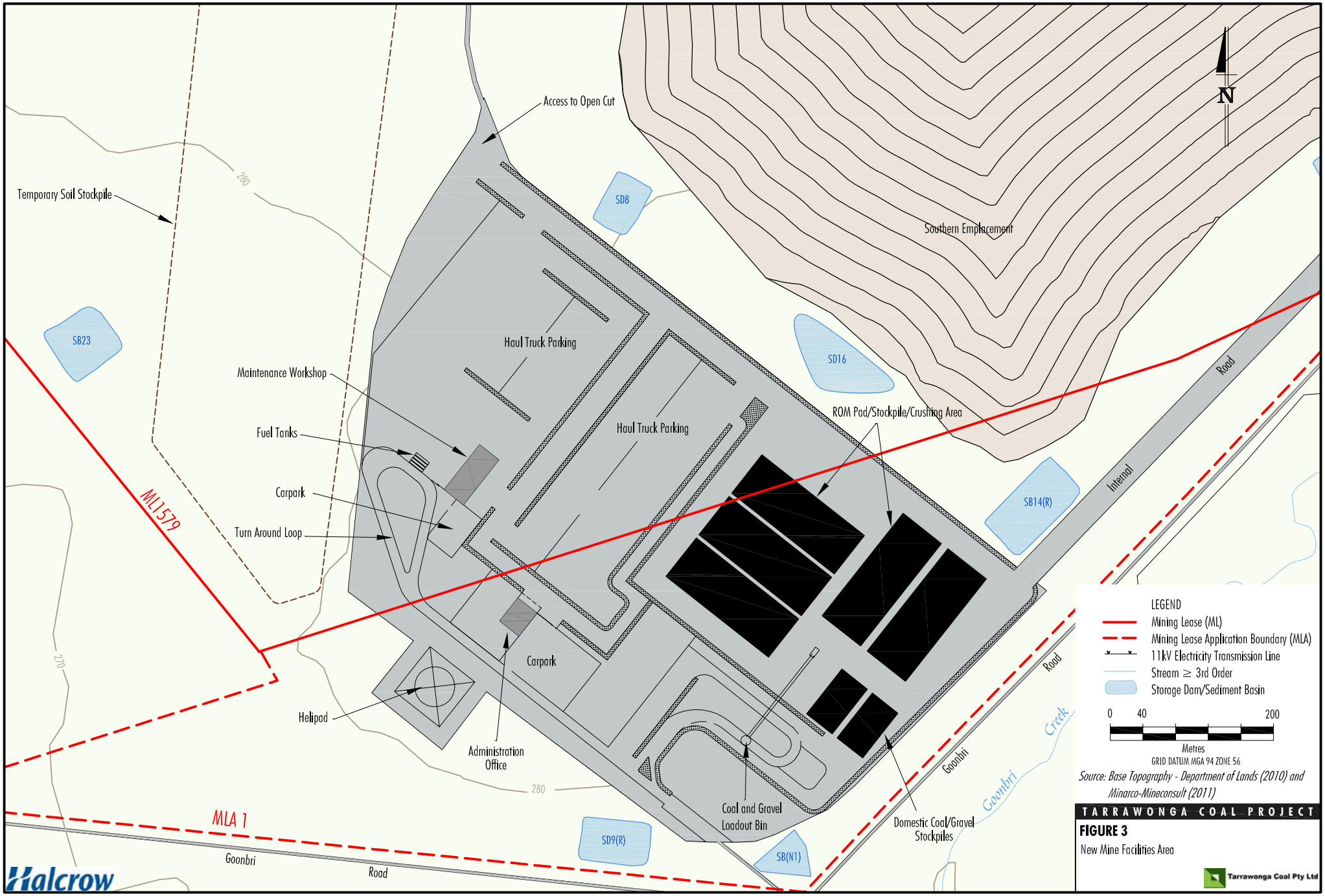
Key aspects of the Project which relate directly to potential impacts on the road transport network are summarised below.

Life of Mine

- The overall life of the mine would be extended to approximately 2029.

Materials Haulage

- Transport of up to 2Mtpa of sized ROM coal from the TCM to the CHPP for export, utilising the approved haul route prior to suitable approvals and upgrades being in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities (expected to occur during Project Year 1).



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- Reduction in the maximum amount of domestic specification coal collected from the TCM by domestic customers from 450,000tpa to 150,000tpa, utilising the haul route from Gunnedah or via Kamilaroi Highway, Rangari Road and the haul route from Boggabri and surrounding areas.
- No change to sized ROM or domestic specification coal haulage despatch hours, i.e., between 7.00am and 9.15pm Monday to Friday and between 7.00am and 5.15pm on Saturdays, excluding public holidays.
- Transport of sized ROM coal from the TCM to the Boggabri Coal Mine via an internal haul road link after suitable approvals and upgrades are in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities (expected to occur during Project Year 1).
- Collection of 90,000m^3 of crushed gravel per annum from the TCM by customers, utilising the haul route from Gunnedah or via Kamilaroi Highway, Rangari Road and the haul route from Boggabri and surrounding areas.
- Gravel collection would occur between 7.00am and 9.15pm Monday to Friday and between 7.00am and 5.15pm on Saturdays, excluding public holidays.
- The maximum combined transport rate for sized ROM coal, domestic specification coal and gravel would not exceed 2Mtpa.
- Short-term transport of fill material (bentonite) would be required for the construction of the low permeability barrier for three months during Project Year 12.
- Fill material (bentonite) deliveries would occur between 6.00am and 6.00pm Monday to Friday and between 7.00am and 5.15pm on Saturdays, excluding public holidays.

Workforce

- Increase in light vehicle traffic generation as a direct result of the increase in employees from 86 to 120 full time on-site personnel.
- Modifications to shift arrangements to accommodate 24 hour operations. Nominal shift start and finish times at full development would be as follows:
    - Administration personnel – 7.00am to 5.00pm weekdays;
    - Mining Operations Day Personnel – 6.30am to 7.00pm; and
    - Mining Operations Night Personnel – 6.30pm to 7.00am.

- Increase in light vehicle traffic generation associated with the construction workforce, which would comprise 20 additional personnel, for the construction and development activities required during the life of the Project.

Deliveries and Visitors

- Increase in deliveries of materials and consumables and visitors associated with the construction and development activities required during the life of the Project.
- Increase in deliveries of consumables and visitors directly resulting from increased ROM coal production and on-site activity.
- No change to deliveries and visitor hours, i.e., generally between 6.00am and 6.00pm daily.

Road System

- Realignment of sections of Goonbri Road and construction of new intersections.

3 Background Road Transport Conditions

An appreciation of the existing road transport conditions can be gained by examining the road network, existing traffic volumes, past growth in traffic volumes, and the safety history of the locality. These aspects are discussed below.

3.1 Road Hierarchy

It is usual to classify roads according to a road hierarchy, in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry given their classification. There are various classification systems used by local authorities and the RTA. The Traffic Authority of NSW (1978) has set down the following guidelines for the functional classification of roads:

- Arterial Road – typically a main road carrying over 15,000 vehicles per day (vehicles/day) and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour [vehicles/hour]).
- Sub-arterial Road – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles/day (500 to 2,000 vehicles/hour).
- Collector Road – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles/day (250 to 1,000 vehicles/hour). At volumes greater than 5,000 vehicles/day, residential amenity begins to decline noticeably.
- Local Road – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles/day (250 vehicles/hour).

In recent years the RTA has adopted a classification system relating to funding purposes. It defines roads as:

- State Roads – performing an important state function for which the RTA funds 100% of the maintenance cost. State roads are essentially arterial roads, and include Freeways, State Highways, and many Main Roads.
- Regional Roads – roads performing a significant regional function and for which the RTA and Council contribute 50% each towards maintenance. Regional roads are essentially sub-arterial roads, and include some lesser Main Roads.
- Local Roads – roads performing a local or collector function and for which the Council funds 100% of the maintenance cost.

3.2 Existing Road Network

The existing road network in the vicinity of the TCM is shown in **Figure 1** and is described below.

Kamilaroi Highway (State Highway 29) is a State Road which runs generally north-south to the west of the TCM, and provides a link between the upper Hunter region and the north-west of NSW, providing access to regional centres such as Gunnedah, Boggabri, Narrabri and Bourke. In the vicinity of the TCM, Kamilaroi Highway has a single travel lane in each direction, with auxiliary turn lanes at some intersections, and a posted speed limit of 100 kilometres per hour (km/hr). At the Kamilaroi Highway intersection with Rangari Road, Kamilaroi Highway is widened to provide a separate right turn lane and a left turn deceleration lane. The Kamilaroi Highway intersection with Blue Vale Road, Kamilaroi Highway has separate deceleration and acceleration lanes to accommodate the slower moving coal trucks on the haul route with minimum disruption to the through traffic.

Rangari Road (Main Road 357) is a Regional Road which runs approximately east-west to the south of the TCM, and links between Kamilaroi Highway to the west and Manilla to the east. Rangari Road typically has a single travel lane in each direction, and a posted speed limit of 80km/hr. Rangari Road crosses the Namoi River about 1.6km to the east of its intersection with Kamilaroi Highway. At this bridge, Rangari Road is narrowed to a single lane with a 10km/hr speed limit, and eastbound traffic is required to give way to westbound traffic. Traffic associated with the existing Boggabri Coal Mine uses Rangari Road to access Leards Forest Road. Rangari Road is also known as Boggabri-Manilla Road and Manilla Road.

Goonbri Road is a local road that provides access to the TCM, and has a single travel lane in each direction. Aside from a short section near its intersection with Leards Forest Road, Goonbri Road is unsealed.

Hoad Lane provides a local road connection northwards from Blue Vale Road at Braymont Road/Shannon Harbour Road to north of the Canyon Coal Mine (under closure), then an east-west connection to Braymont Road. A private road access to the Canyon Coal Mine intersects with Hoad Lane at a tee intersection. South of the Canyon Coal Mine access road, Hoad Lane has a sealed surface, with a single travel lane in each direction, and centre road markings along most of its length. A right turn deceleration lane is provided in Hoad Lane/Blue Vale Road for northbound vehicles turning right into Shannon Harbour Road. An acceleration lane is provided in Hoad Lane/Blue Vale Road for vehicles which have turned left into Hoad Lane/Blue Vale Road from Shannon Harbour Road. To the north of the Canyon Coal Mine access road, and to the east of Braymont Road, Hoad Lane has an unsealed surface.

It is noted that the road traffic noise criteria for Hoad Lane in TCM Development Consent (DA 88-4-2005 MOD 1) are based on the collector road classification.

Blue Vale Road is a local road that provides a north-south connection from Kamilaroi Highway to the north-west of Gunnedah to the intersection of Hoad Lane, Shannon Harbour Road and Braymont Road. At this intersection, Hoad Lane and Blue Vale Road form the main road, with Shannon Harbour Road and Braymont Road being staggered tee intersections. Blue Vale Road has a sealed surface with a single travel lane in each direction and centre line marking along much of its length.

It is noted that the road traffic noise criteria for Blue Vale Road in the TCM Development Consent (DA 88-4-2005 MOD 1) are based on the collector road classification.

Leards Forest Road is a local rural road with a single travel lane in each direction. It extends northwards from Rangari Road and connects to Harparary Road to the north. The Boggabri Coal Mine has its vehicular access off Leards Forest Road. Its intersection with Rangari Road is a give way controlled tee intersection with no additional turn lanes or deceleration lanes. It typically does not have road markings, and the northern section of Leards Forest Road between the Boggabri Coal Mine access road and Harparary Road has an unsealed gravel surface.

Braymont Road provides a local road link from the township of Boggabri east and south-east to meet with Blue Vale Road some 20km north of the Gunnedah township. Braymont Road crosses the Namoi River via a bridge to the east of Boggabri. To the west of the river, Braymont Road has a sealed surface with a single travel lane in each direction, and to the east of the river, it has an unsealed surface, and follows a straight east-west alignment for about 6km, before a 90 degree bend where it intersects with Barbers Lagoon Road at a three way intersection. Between there and Blue Vale Road, it has an unsealed surface, with the exception of a short distance of sealed road on its approach to Blue Vale Road.

Barbers Lagoon Road is a local road and extends in a north-south direction between Braymont Road in the south and Rangari Road in the north. The northernmost 700 metres (m) of Barbers Lagoon Road has a sealed surface, with a single travel lane in each direction and a marked centre line on its approach to Rangari Road. The remaining length of Barbers Lagoon Road has an unsealed surface and follows a reasonably straight north-south alignment, with the exception of a dog-leg about 1.2km north of Braymont Road.

3.3 Existing Traffic Volumes and Composition

3.3.1 Traffic Surveys

Traffic survey data has been collated on roads around the TCM from surveys conducted by the Gunnedah Shire Council and TCPL. At each location, hourly traffic volumes were recorded by direction. At some locations, the classification of vehicles was also undertaken using the Austroads (2004) Vehicle Classification System, which is included in **Attachment A**.

The majority of the surveys were conducted over one week from 30 November to 6 December 2010, with some exceptions. The locations of the traffic data collection are shown on **Figure 1.**

3.3.2 Surveyed Traffic Volumes

The results of the traffic surveys are summarised in Table 3.1 and full results are presented in **Attachment A**.

The surveys indicate that generally, weekday traffic volumes are the most significant, with Saturdays typically being busier than Sundays. The volume of traffic generated by the TCM is significantly higher on weekdays than on Saturdays or Sundays.

Table 3.2 presents the average weekday peak hourly volume measured at each of the survey locations. The average weekday peak hourly volume is the maximum volume recorded in any one hour period throughout the day. The time of each peak volume is therefore not necessarily the same at each location, and at some locations, the peak volume occurred during more than one hour. The peak hour volumes are typically in the range of 8 to 12 percent of the daily volumes.

Table 3.1 – Surveyed Daily Two Way Traffic Volumes (vehicles/day)

Site[A]	Road and Location	Average Weekday	Saturday	Sunday
	Haul Route			
1	TCM Access Rd	564	287	51
2	Haul Route south of Goonbri Rd	540	278	70
3	Blue Vale Rd south of Shannon Harbour Rd[B]	480	230	80
4	Blue Vale Rd northeast of Kamilaroi Hwy[C]	1,515	997	145
5	Kamilaroi Hwy between Blue Vale Rd and CHPP	3,188	2,226	1,702
6	CHPP Access Rd	673	193	10
	Other Locations			
7	Dripping Rock Rd east of Goonbri Rd	21	4	3
8	Goonbri Rd east of Leards Forest Rd	57	27	24
9	Leards Forest Rd north of Goonbri Rd	311	99	112
10	Barbers Lagoon Rd south of Rangari Rd	51	37	40
11	Rangari Rd east of Haul Route	67	50	37
12	Rangari Rd west of Haul Route	637	344	132
13	Rangari Rd east of Kamilaroi Hwy	369	105	117
14	Therribri Rd north of Rangari Rd	62	49	59
15	Shannon Harbour Rd east of Blue Vale Rd[B]	217	74	31
16	Kamilaroi Hwy south of Rangari Rd	2,028	1,391	1,325
17	Braymont Rd at Namoi River Bridge[D]	122	-	-
18	Kamilaroi Hwy north of Blue Vale Rd	2,488	1,946	1,762

[A] Refer to Figure 1; [B] Survey 8-14 February 2011; [C] Survey 4-10 November 2010; [D] Data available for Tuesday to Friday only

Table 3.2 – Surveyed Average Weekday Peak Hour Two Way Traffic (vehicles/hour)

Site[A]	Road and Location	Peak Hourly Volume	Percent of Daily Volume	Time of Peak Hour
	Haul Route			
1	TCM Access Rd	65	11.5%	4pm-5pm
2	Haul Route south of Goonbri Rd	52	9.6%	4pm-5pm
3	Blue Vale Rd south of Shannon Harbour Rd[B]	43	9.0%	6am-7am, 4pm-5pm
4	Blue Vale Rd northeast of Kamilaroi Hwy[C]	114	7.5%	3pm-4pm
5	Kamilaroi Hwy between Blue Vale Rd and CHPP	244	7.7%	3pm-4pm
6	CHPP Access Rd	55	8.2%	12pm-1pm, 5pm-6pm
	Other Locations			
7	Dripping Rock Rd east of Goonbri Rd	3	14.3%	5pm-6pm
8	Goonbri Rd east of Leards Forest Rd	8	14.0%	4pm-5pm
9	Leards Forest Rd north of Goonbri Rd	48	15.4%	5am-6am
10	Barbers Lagoon Rd south of Rangari Rd	5	9.8%	3pm-4pm, 5pm-6pm
11	Rangari Rd east of Haul Route	8	11.9%	6am-7am
12	Rangari Rd west of Haul Route	60	9.4%	4pm-5pm
13	Rangari Rd east of Kamilaroi Hwy	43	11.7%	5am-6am
14	Therribri Rd north of Rangari Rd	6	9.7%	1pm-2pm, 3pm-4pm
15	Shannon Harbour Rd east of Blue Vale Rd[B]	18	8.3%	9am-10am
16	Kamilaroi Hwy south of Rangari Rd	154	7.6%	4pm-5pm
17	Braymont Rd at Namoi River Bridge[D]	15	12.3%	4pm-5pm, 5pm-6pm
18	Kamilaroi Hwy north of Blue Vale Rd	202	8.1%	4pm-5pm

[A] Refer to Figure 1; [B] Survey 8-14 February 2011; [C] Survey 4-10 November 2010; [D] Data available for Tuesday to Friday only

3.3.3 Traffic Composition

The surveys described in Section 3.3.1 also provided data on the composition of traffic on the key roads. Light vehicles include motorcycles, cars, vans, 4WDs, and utes (including those towing a trailer or caravan). Heavy vehicles include single unit trucks and buses with two to four axles and articulated vehicles such as semi-trailers, rigid trucks with trailers and B Doubles.

Table 3.3 summarises the composition of the traffic on the average weekday over the survey period.

Table 3.3 – Average Weekday Traffic Composition

Site[A]	Road and Location	Percent	
		Light	Heavy
	Haul Route		
1	TCM Access Rd	37.2	62.8
2	Haul Route south of Goonbri Rd	30.9	69.1
3	Blue Vale Rd south of Shannon Harbour Rd[B]	43.3	56.7
4	Blue Vale Rd northeast of Kamilaroi Hwy[C]	61.2	38.8
5	Kamilaroi Hwy between Blue Vale Rd and CHPP	68.1	31.9
6	CHPP Access Rd	19.9	80.1
	Other Locations		
7	Dripping Rock Rd east of Goonbri Rd	66.7	33.3
8	Goonbri Rd east of Leards Forest Rd	88.3	11.7
9	Leards Forest Rd north of Goonbri Rd	93.0	7.0
10	Barbers Lagoon Rd south of Rangari Rd	90.2	9.8
11	Rangari Rd east of Haul Route	94.0	6.0
12	Rangari Rd west of Haul Route	47.7	52.3
13	Rangari Rd east of Kamilaroi Hwy	89.9	10.1
14	Therribri Rd north of Rangari Rd	94.8	5.2
15	Shannon Harbour Rd east of Blue Vale Rd[B]	38.5	61.5
16	Kamilaroi Hwy south of Rangari Rd	81.2	18.8
17	Braymont Rd at Namoi River Bridge[D]	93.6	6.4
18	Kamilaroi Hwy north of Blue Vale Rd	45.1	54.9

[A] Refer to Figure 1, [B] Survey 8-14 February 2011; [C] Survey 4-10 November 2010; [D] Data available for Tuesday to Friday only

The proportional contribution to total daily traffic varies significantly on the roads in the local region.

3.3.4 Roadway Capacity

The Austroads (2009) *Guide to Traffic Management Part 3: Traffic Studies and Analysis* provides guidelines for the capacity of two lane, two way rural roads, which in turn, refers to the *Highway Capacity Manual* (Transportation Research Board, 2000), known as HCM 2000.

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 single traffic lane will be affected by factors such as the pavement width and restricted lateral clearances, the presence of heavy vehicles and grades.

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.

HCM 2000 distinguishes between different categories of two lane two way roads, with Class I being 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.

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. It is noted that the unsealed roads providing access for the TCM would have lower capacities than the typical Class II sealed roads addressed by the HCM assessment methods, however these are considered below as a guide to the current Levels of Service on these roads.

Most arterial roads such as Kamilaroi Highway are considered to be Class I, however the primary determinant of a road's classification for operational analysis is the drivers' expectations, which may not necessarily agree with the functional classification. The PTSF is a measure of the level of opportunities to overtake. The LOS criteria for Class I and Class II two-lane highways are as shown in Table 3.4.

Table 3.4 – Level of Service Criteria for Two Lane Highways

Level of Service	Class I Highways		Class II Highways
	Percent-Time-Spent-Following	Average Travel Speed (km/h)	Percent-Time-Spent-Following
A	≤ 35	> 90	≤ 40
B	> 35-50	> 80-90	> 40-55
C	> 50-65	> 70-80	> 55-70
D	> 65-80	> 60-70	> 70-85
E	>80	≤ 60	〈 85

Source: Exhibit 20-2 and Exhibit 20-4, HCM 2000

HCM 2000 presents detailed methods for calculating the PTSF, however it also presents a basic relationship between traffic flow rate and PTSF for base conditions on a two way road. This indicates that below a two way peak hourly two way volume of around 650 vehicles per hour, the PTSF would typically be below 40 percent, and LOS would be A for Class II roads (refer to Table 3.4). Below a two way peak hourly volumes of around 550 vehicles per hour, the PTSF would typically be below 35 percent, and LOS would be A for Class I roads. Comparing this against the peak hourly volumes presented in Table 3.2, it is clear that the existing peak hourly volumes are well below 550 vehicles per hour on Kamilaroi Highway and below 650 vehicles per hour at all other surveyed sites. The LOS at each of the surveyed sites is therefore considered to be A. More detailed analysis is not considered warranted in this case, as the peak hourly volumes are so far below the volume threshold where poorer service levels would result, and the terrain and road geometry is unlikely to result in significant impacts on the free flow speeds on the routes.

3.3.5 TCM Traffic Generation

The results of the traffic survey conducted on the TCM access road indicate that over the surveyed week, the TCM generated an average of 564 vehicles trips per weekday. This correlates with the expected average of 564 vehicles per weekday determined in Table 2.2 by considering the typical daily generation by different types of vehicles.

Table 3.5 compares the surveyed average weekday traffic volumes on the surrounding road system with the calculated volume of traffic generated by the TCM at the same locations. From this, the volume of traffic with no association with the TCM is calculated.

Table 3.5 – Average Weekday TCM and Non-TCM Traffic (vehicles/day)

Site[A]	Road and Location	Surveyed Total Traffic	Calculated TCM Traffic[B]	Calculated Non-TCM Traffic[C]
	Haul Route			
1	TCM Access Rd	564	564	0
2	Haul Route south of Dripping Rock Rd	540	541	-1
3	Blue Vale Rd south of Shannon Harbour Rd	480	480	0
4	Blue Vale Rd northeast of Kamilaroi Hwy	1,515	480	1,035
5	Kamilaroi Hwy btwn Blue Vale Rd and CHPP	3,188	478	2,710
6	CHPP Access Rd	673	312	361
	Other Locations			
7	Dripping Rock Rd east of Goonbri Rd	21	2	19
8	Goonbri Rd east of Leards Forest Rd	57	20	37
9	Leards Forest Rd north of Goonbri Rd	311	0	311
10	Barbers Lagoon Rd south of Rangari Rd	51	10	41
11	Rangari Rd east of Haul Route	67	12	55
12	Rangari Rd west of Haul Route	637	48	589
13	Rangari Rd east of Kamilaroi Hwy	369	56	313
14	Therribri Rd north of Rangari Rd	62	0	62
15	Shannon Harbour Rd east of Blue Vale Rd	217	0	217
16	Kamilaroi Hwy south of Rangari Rd	2,028	32	1,996
17	Braymont Rd at Namoi River Bridge	122	10	112
18	Kamilaroi Hwy north of Blue Vale Rd	2,488	2	2,486

[A] Refer to Figure 1; [B] Refer to Table 2.2; [C] The negative value calculated is of no practical significance, and is considered to be zero in the analysis which follows.

Table 3.5 indicates that with the exception of on the haul route itself, the TCM-generated traffic volume is low on surrounding roads, and generally makes only a minor contribution to total traffic volumes. Background non-TCM traffic on the haul route is typically very low, with the exception of the southern end of the haul route, on Kamilaroi Highway and Blue Vale Road close to Gunnedah township, i.e. Sites 4 and 5 on **Figure 1**.

3.4 Historic Annual Average Daily Traffic on RTA Roads

The RTA publishes traffic volume data at selected locations on its roads. Available data on roads in the vicinity of the TCM was collated. Table 3.6 presents historic annual average daily traffic (AADT) data for the RTA's surveyed locations in the local area, and shows how changes in daily traffic volumes have occurred on these roads over that period. It should be noted that the AADT represents the average number of axle pairs (rather than vehicles) passing in both directions during a 24 hour period, estimated over a period of one year.

Table 3.6 – Historic Annual Average Daily Traffic Data (1992 to 2005)

Location	1992	1996	1999	2002	2005	Average Change per Year
Kamilaroi Highway SH29						
92.227 11km West of SH17 Newell Hwy	1,636	1,623	-	-	-	-3
92.289 5km South of SH17 Newell Hwy	1,750	1,903	2,309	2,240	-	49
92.293 South of MR357 Rangari Road	1,867	-	2,163	2,232	1,832	-3
Rangari Road MR357						
92.168 East of MR72 Narrabri Rd	153	-	138	162	175	2

The historic AADT data indicates that while there have been some fluctuations recorded in the AADT, these have not resulted in significant increases or decreases in volumes over the relevant period. Table 3.6 demonstrates that the greatest average change over the period was recorded on Kamilaroi Highway south of Newell Highway, with an increase of around 50 axle pairs per year from 1992 to 2002.

3.5 Road Safety Review

Validated crash data was obtained from the RTA for the most recent five year period available, being from 1 October 2005 to 30 September 2010. The data is presented in **Attachment B**.

The data is based on crashes reported to the Police, and included the area approximately bounded by the Werris Creek – Mungindi Railway to the west, north to Baan Baa, east to Wean Road and south to the boundary of Gunnedah township (refer to **Attachment B** for a map of the data area). There were 63 reported crashes in the study area, which included one fatal crash, 29 injury crashes, and 33 non-injury tow-away crashes. The RTA data nominates speed as a factor in 18 of the crashes, fatigue as a factor in ten of the crashes, and alcohol as a factor in four of the crashes. No factors were nominated for the remaining 31 crashes.

The data was reviewed with regard to crashes which occurred on roads of direct interest to the TCM, notably along the haul route and on roads used by employees and visitors to access the TCM. It is noted that some of the descriptions of the location of crashes are fairly broad, e.g. "5km north of Gunnedah township" thus the exact location of the crash cannot be clearly identified from the data provided. The following summary of crashes in Table 3.7 includes those which occurred on the haul route, or nearby to the haul route, and on the roads used by employees and delivery vehicles to access the TCM, with the exception of those parts of Kamilaroi Highway not on the haul route.

TCPL also provided data on incidents involving their vehicles, with the following incidents noted:

- 2004 – coal truck overturned at the intersection of Blue Vale Road and Kamilaroi Highway;
- 2006 – coal truck trailer released from truck and collided with tree on Blue Vale Road;
- 2007 – coal truck overturned on the haul route south of Dripping Rock Road;
- 23/09/2008 – coal truck rollover near Canyon corner;
- 10/12/2008 – light vehicle collision with a coal truck;
- 5/05/2009 – a tyre blowout caused two coal trucks to side swipe each other near the Blue Vale speedway;
- 25/09/2009 – coal truck rollover on the corner of Rangari Road, turntable came apart (included in Table 3.7); and
- 18/02/2011 – a light vehicle rollover near Canyon corner injuring driver.

Table 3.7 – Crashes on TCM Related Roads (1 Oct 2005 - 30 Sep 2010)

Date	Location	Description	Factors
6.30am Thu 3/4/2006	Kamilaroi Hwy 5km north of Gunnedah township	618584 southbound car struck an animal on the road	Fine weather Dry road
3.30pm Sat 29/4/2006	Rangari Rd 2km west of Wean Racecourse	518820 westbound car left the carriageway to the left on a straight section	Fine weather Dry road
11.00am Sat 8/7/2006	Wean St 5.39km east of Boggabri township	528464 eastbound four wheel drive left the carriageway to the right on a left hand bend and struck an object	Speed Fine weather Dry road
7.30am Sun 9/7/2006	Rangari Rd 5km east of Blue Vale Rd	528532 eastbound car left the carriageway on a straight section to the left	Fatigue Dry road
1.00pm Mon 2/11/2006	Blue Vale Rd 640m south of Vickery Rd	554911 southbound semitrailer left the carriageway to the left on a left hand bend and struck an object	Fine weather Dry road
5.05pm Wed 10/12/2008	Blue Vale Rd 8km north of Gunnedah township	649912 northbound B-double pulled out to the right overtaking a light truck which was also turning right	Fine weather Dry road
2.20pm Tue 5/5/2009	Blue Vale Rd 9.725km north of Kamilaroi Hwy	660016 northbound large rigid truck on the incorrect side of the road collided head on with a southbound B-double which was in its lane	Fine weather Dry road
1.10pm Fri 25/9/2009	Rangari Rd 16km east of Kamilaroi Hwy	686531 southbound B-double moving forward in a driveway left the carriageway to the left on a left hand bend	Speed Fine weather Dry road
12.30pm Sun 10/1/2010	Braymont Rd 80m east of Hull Rd	696487 westbound light truck left the carriageway to the right on a right hand bend and struck an object	Speed Fine weather Dry road
4.45pm Wed 19/5/2010	Rangari Rd 5.44km east of Kamilaroi Hwy	710481 westbound large rigid truck lost control and left the carriageway on a curve	Speed Fine weather Dry road
6.50pm Thu 18/2/2010	Rangari Rd 110m west of the iron bridge	699410 northbound motorcycle moving forward in a driveway collided with a westbound light truck	Fine weather Dry road
6.25pm Mon 9/8/2010	Kamilaroi Hwy 50m south of Blue Vale Rd	720826 southbound car collided with northbound large rigid truck at temporary roadworks, one injury	Fine weather Dry road

Review of the RTA crash data and TCPL incident data has identified no particular causation factors on the local roads used by the TCM coal trucks and employees. The majority of the RTA reported crashes involved loss of control of the vehicle, causing the vehicle to leave the carriageway. The RTA reported crashes occurred in fine weather on dry road surfaces, thus it is considered that local weather and road surface conditions do not adversely contribute to the crash history of the area.

3.6 Car Parking

Significant areas of on-site car parking are available at the TCM for staff, visitors and on-site contractors.

3.7 School Buses

School buses operate in the local area, providing access for students to the local schools, including primary schools in Gunnedah and Boggabri, and a high school in Gunnedah. The school buses are run by numerous operators, and the majority do not operate close to the haul route. A school bus route, Blue Vale to Gunnedah, operates along and across the haul route. This route operates between 7.50am and 8.40am, and between 3.20pm and 3.58pm on school days.

This school bus route starts and ends on Hoad Lane west of the haul route, and crosses the haul route in an east-west direction on Hoad Lane, where the haul route operates north-south on the Canyon Coal Mine road. At this location, the buses on Hoad Lane have right of way. The buses continue along Hoad Lane, and operate along the haul route between Hoad Lane at the eastern Canyon Coal Mine access road, and Blue Vale Road at the Old Blue Vale Road intersection.

Currently this route stops at five properties near the haul route, four of which are on the length of Hoad Lane which is not the approved haul route. The bus stops at these properties between 7.50am and 7.56am on the way to St Xavier's School, St Mary's School and Gunnedah South School, and between 3.52pm and 3.58pm on the return journey in the afternoon. The fifth property is on Old Blue Vale Road near Gunnedah, which is also not on the haul route, and the bus stops here at 8.20am and 3.30pm. It is understood from the operator that until recently, this route also stopped at a property on Blue Vale Road, however those residents have since moved. There may soon be another stop at another property on Hoad Lane, also not on the haul route.

In accordance with Condition 38(b) of Development Consent (DA 88-4-2005 MOD 1) for the TCM, coal trucks must reduce speed to 40km/hr in the vicinity of the school bus when it is operating on Hoad Lane. As noted above, the school bus does not currently stop on that part of Hoad Lane which is used by coal haulage trucks.

3.8 Other Developments

3.8.1 Boggabri Coal Mine

The Boggabri Coal Mine is located to the immediate north of the Project. In October 2009, Boggabri Coal Pty Limited submitted a Project Application to the NSW Department of Planning and Infrastructure for the continuation of its mining operations for a further 21 years.

Parsons Brinckerhoff (2010) prepared a traffic impact assessment for inclusion in the Continuation of the Boggabri Coal Mine Environmental Assessment and estimated that the Boggabri Coal Mine would result in the following additional vehicle movements:

- additional 353 operational employees would generate approximately 527 vehicle trips per day during peak production (2016); and
- 150 construction employees would generate approximately 224 vehicle trips per day during peak construction (2016).

Given the above, it has been assumed that the Continuation of the Boggabri Coal Mine would generate an additional 751 trips per day during peak construction (Year 4 of the Project) and approximately 527 trips per day thereafter. The full increase in construction and operational employees would not occur immediately however, and for the purpose of this assessment, it has been assumed that during Year 1 of the Project (2013), 50% of the peak additional construction and operational workforce would be on the Boggabri Coal Mine site, i.e., 378 vehicle trips per day.

The Continuation of the Boggabri Coal Mine construction workforce described above would upgrade the Boggabri Coal Mine Infrastructure Facilities to receive ROM coal from the Project during 2013 (Year 1 of the Project). The morning and afternoon peak hours for the Continuation of the Boggabri Coal Mine are expected to be 5.45am to 6.45am and 5.00pm to 6.00pm, respectively (Parsons Brinckerhoff, 2010).

The Boggabri Coal Mine has its vehicular access off Leards Forest Road, and a section of Leards Forest Road would be closed to through traffic in the future. It is anticipated that traffic that previously used Leards Forest Road would use Therribri Road or Kamilaroi Highway once Leards Forest Road has been closed (Parsons Brinckerhoff, 2010). The potential cumulative effects of the proposed Continuation of the Boggabri Coal Mine have been considered in the context of the Project traffic flows in Section 4.5.

3.8.2 Maules Creek Project

Aston Coal 2 Pty Ltd lodged a Project Application to the NSW Department of Planning and Infrastructure for the Maules Creek Project in August 2010. The Maules Creek Project would include the development of surface infrastructure and open cut mining activities for a period of 21 years (Hansen Bailey, 2010) and is located approximately 5km to the north-northeast of the Project.

Hyder Consulting (2010) prepared a traffic and transport impact assessment as part of the Maules Creek Project Environmental Assessment. That assessment estimated that the Maules Creek Project would result in the following additional vehicle movements, noting that shuttle buses would be used to transport the majority of employees (Hyder Consulting, 2010):

- 470 operational employees would generate approximately 78 vehicle trips per day during peak production (2020);
- 340 construction employees would generate approximately 128 vehicle trips per day during peak construction (2012); and
- heavy vehicle deliveries would generate approximately 66 vehicle trips per day during peak construction (2012).

Leards Forest Road would be used initially to access the Maules Creek Project and then Therribri Road would be utilised once the site access road has been completed. Light vehicles (including employee shuttle buses) would obtain access to the site via Kamilaroi Highway, Rangari Road, Therribri Road/Leard Forest Road. Heavy vehicles would access the site via Blue Vale Road, Braymont Road, Barbers Lagoon, Rangari Road and Therribri Road/Leards Forest Road (Hyder Consulting, 2010).

It has conservatively been assumed that the peak Maules Creek Project construction activity (nominally 2012) would coincide with Year 1 activity of the Project (nominally 2013). Further, it is assumed that up to half of the operational traffic may also be present during the peak construction period. This assessment wherefore assumes that the Maules Creek Project would generate approximately 233 vehicle trips per day during Year 1, and approximately 78 vehicle trips per day thereafter. The potential cumulative effects of the Maules Creek Project have been considered in the context of the Project traffic flows in Section 4.5.

The morning and afternoon peak hours for the Maules Creek Project are expected to be 5.00am to 6.00am and 6.00pm to 7.00pm, respectively (Hyder Consulting, 2010).

4 Future Road Transport Conditions

The remainder of this report assesses the likely implications of the Project on the road network surrounding the TCM. The future stages of particular interest to the Project with regard to road transport conditions are:

- Year 1 (2013), during which Project construction activity would peak, and increases in operational traffic and background growth in non-Project traffic would be expected. This scenario would also include construction and operational traffic from the Continuation of the Boggabri Coal Mine (refer to Section 3.8.1) and construction and some operational traffic from the Maules Creek Project[2] (refer to Section 3.8.2);
- Year 4 (2016), during which maximum Project operational activity would occur at the same time as increases in background growth in non-Project traffic. This scenario would also include peak construction and operational traffic from the Continuation of the Boggabri Coal Mine and peak operational traffic from the Maules Creek Project; and
- Year 17 (2029), during which maximum Project operational activity would occur at the same time as maximum background growth in non-Project traffic. This scenario would also include peak operational traffic from the Continuation of the Boggabri Coal Mine and the Maules Creek Project. For the "No Project" scenario, the TCM would have ceased operation, thus there would be no TCM operational traffic.

Traffic movements during the decommissioning stage of the Project would be significantly lower than the construction and operational stages of the Project identified above. The potential road transport impacts associated with the decommissioning stages of the Project would therefore be less than the construction and operational stages of the Project (assessed in this section) and therefore do not warrant further consideration in this study.

[2] Although peak construction for the Maules Creek Project is expected to occur in 2012 (Hyder Consulting, 2010), this assessment conservatively assumes that it would occur during Year 1 (2013) of the Project, i.e., during peak Project construction.

4.1 *Background Traffic Growth*

The historic AADT data for Kamilaroi Highway (refer to Section 3.4) indicate that daily traffic volumes have tended to fluctuate without resulting in significant increases or decreases over time. Notwithstanding, and for the purpose of this assessment, a background growth in daily traffic of 1.0% per annum has been assumed.

This background growth is assumed to occur on all roads in the vicinity of the Project, which is considered to result in conservatively high estimates of future traffic volumes.

In addition to this background growth, the traffic estimated to be generated by the Continuation of the Boggabri Coal Mine and the Maules Creek Project has been distributed on the road system using information in Parsons Brinckerhoff (2010) and Hyder Consulting (2010) (refer to Section 3.8).

Table 4.1 summarises how the traffic not associated with the existing TCM or the Project, including traffic to and from the Continuation of the Boggabri Coal Mine and Maules Creek Project, can be expected to increase over time.

Table 4.1 – Average Weekday Non-TCM Daily Traffic (vehicles/day)

Site[A]	Road and Location	2010[B]	2013	2016	2029
	Haul Route				
1	TCM Access Rd	0	0	0	0
2	Haul Route south of Goonbri Rd	0	0	0	0
3	Blue Vale Rd south of Shannon Harbour Rd	0	70	4	4
4	Blue Vale Rd northeast of Kamilaroi Hwy	1,035	1,136	1,101	1,235
5	Kamilaroi Hwy btwn Blue Vale Rd and CHPP	2,710	2,861	2,876	3,228
6	CHPP Access Rd	361	372	383	430
	Other Locations				
7	Dripping Rock Rd east of Goonbri Rd	19	66	95	76
8	Goonbri Rd east of Leards Forest Rd	37	84	114	96
9	Leards Forest Rd north of Goonbri Rd	311	928	1,080	897
10	Barbers Lagoon Rd south of Rangari Rd	41	113	47	53
11	Rangari Rd east of Haul Route	55	132	209	171
12	Rangari Rd west of Haul Route	589	681	774	806
13	Rangari Rd east of Kamilaroi Hwy	313	747	931	815
14	Therribri Rd north of Rangari Rd	62	64	144	152
15	Shannon Harbour Rd east of Blue Vale Rd	217	224	230	258
16	Kamilaroi Hwy south of Rangari Rd	1,996	2,380	2,554	2,702
17	Braymont Rd at Namoi River Bridge	112	116	119	134
18	Kamilaroi Hwy north of Blue Vale Rd	2,488	2,749	3,011	3,223

[A] Refer to Figure 1; [B] Refer to Table 3.5.

Table 4.1 demonstrates that significant changes to traffic that is not associated with the TCM can be expected in the region in the future.

4.2 Traffic Generated by the Project – Construction

The peak construction phase of the Project would occur during Year 1 (2013) and would include the following:

- relocation of the mine facilities area;
- construction of a services corridor to the Boggabri Coal Mine; and
- re-alignment of sections of Goonbri Road and construction of new intersections.

Other construction and development activities would be required during the life of the Project for short periods. These would be related to construction of the permanent Goonbri Creek alignment, low permeability barrier, the later stages of the realignment of sections of Goonbri Road and construction of new intersections.

These later construction stages would occur for short periods after the cessation of the transport of sized ROM coal on the haul route, i.e., after a significant reduction in the Project-related traffic movements. The potential road transport impacts associated with these later construction stages would therefore be less than the construction and operational stages of the Project (assessed in this section) and therefore have not been considered further in this study.

All construction activities would generally be undertaken during daytime hours up to seven days a week.

4.2.1 Workforce

The Project is expected to attract some 20 additional employees during the peak construction phase during Year 1 (2013). It is assumed that the travel routes of the additional employees would be similar to those of the existing workforce (refer to Section 2.1.1). Car pooling for construction employees would be very limited, and thus for this assessment, it has been assumed that each construction employee would drive a vehicle to and from the site each day. Construction would occur between 7.00am and 6.00pm. On this basis, the additional 20 construction employees would generate an additional 40 light vehicle trips per day.

4.2.2 *Deliveries and Visitors*

The Project is expected to result in an increase of an average of 55 deliveries and visitors each day associated with construction activity. It is expected that deliveries and visitors would generate a mix of light vehicle trips (85%) and heavy vehicle trips (15%), and would be spread evenly across the day between 6.00am and 6.00pm, with vehicles from similar sources and using similar routes to the existing deliveries and visitor traffic (refer to Section 2.1.2).

The Project construction activity would thus result in an increase of 110 vehicle trips per day, of which 18 trips would be expected to be made by heavy vehicles.

Deliveries during the construction period would generally be unloaded within the mine facilities area (refer to **Figures 2** and **3**).

4.2.3 *Total Traffic*

The total traffic generated by the Project construction activity, and its distribution on the surrounding road network is summarised in Table 4.2 below.

Table 4.2 – Average Daily Project Construction Traffic Year 1 (2013) (vehicles/day)

Site[A]	Road and Location	Employee	Delivery and Visitor	Total
	Haul Route			
1	TCM Access Rd	40	110	150
2	Haul Route south of Goonbri Rd	34	110	144
3	Blue Vale Rd south of Shannon Harbour Rd	22	88	110
4	Blue Vale Rd northeast of Kamilaroi Hwy	22	88	110
5	Kamilaroi Hwy between Blue Vale Rd and CHPP	22	88	110
6	CHPP Access Rd	0	0	0
	Other Locations			
7	Dripping Rock Rd east of Goonbri Rd	0	0	0
8	Goonbri Rd east of Leards Forest Rd	5	0	5
9	Leards Forest Rd north of Goonbri Rd	0	0	0
10	Barbers Lagoon Rd south of Rangari Rd	3	0	3
11	Rangari Rd east of Haul Route	4	0	4
12	Rangari Rd west of Haul Route	8	22	30
13	Rangari Rd east of Kamilaroi Hwy	11	22	33
14	Therribri Rd north of Rangari Rd	0	0	0
15	Shannon Harbour Rd east of Blue Vale Rd	0	0	0
16	Kamilaroi Hwy south of Rangari Rd	5	11	16
17	Braymont Rd at Namoi River Bridge	3	0	3
18	Kamilaroi Hwy north of Blue Vale Rd	0	0	0

[A] Refer to Figure 1

Table 4.2 demonstrates that the traffic generated by the construction phase of the Project would tend to be concentrated along the haul route, with lesser volumes on Rangari Road between the haul route and Kamilaroi Highway.

4.3 Traffic Generated by the Project – Operational

As discussed in Section 2.2, the Project would generate additional operational traffic as a result of:

- an increase in the workforce from 86 people to 120 people;
- an increase in Project deliveries and visitors; and
- the addition of transport of gravel from the TCM.

Changes to local traffic conditions would also result from the proposed realignment of sections of Goonbri Road and construction of new intersections.

The various components of the proposed changes to operational traffic conditions are discussed in this section.

4.3.1 Workforce

The Project would result in an increase in on-site employees from the existing 86 full time personnel to 120 full time personnel. It is assumed that the travel characteristics of the additional employees would be similar to those of the existing workforce (refer to Section 2.1.1). On this basis, the additional 34 full time employees would generate an additional 56 light vehicle trips per day.

Nominal start and finish times for the Project would be as follows:

- Administration personnel – 7.00am to 5.00pm weekdays;
- Mining Operations Day Personnel – 6.30am to 7.00pm; and
- Mining Operations Night Personnel – 6.30pm to 7.00am.

The full increase in employees would not occur immediately however, and it is anticipated that in Year 1 (2013), there would be 103 full time employees, who would generate an additional 28 light vehicle trips per day above those generated by the existing 86 employees.

4.3.2 Deliveries and Visitors

The Project is assumed to result in additional deliveries and visitors to the TCM as a direct result of the increase in mining activity. It is estimated that the Project would result in an additional 20 deliveries/visitors per week above the existing 233 weekly deliveries/visitors (refer to Section 2.1.2).

Deliveries and visitors would continue to generate a mix of light vehicle trips (85%) and heavy vehicle trips (15%), and would be spread evenly across the day between 6.00am and 6.00pm, with similar sources to the existing deliveries and visitors.

The Project would thus result in an increase of 40 vehicle trips per week, of which, six trips would be expected to be made by heavy vehicles.

The full increase in delivery and visitor activity would not occur immediately, and it is anticipated that in Year 1 (2013), the Project would result in an additional ten deliveries/visitors per week, i.e., 20 vehicle trips per week, above the existing level.

Deliveries during the operational period would generally be unloaded at the mine facilities area (refer to **Figures 2** and **3**).

4.3.3 Sized ROM Coal Haulage

The Project would include the continuation of the transport of up to 2Mtpa of sized ROM coal to the CHPP via the haulage route during Year 1 (or prior to suitable approvals and upgrades being in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities). The sized ROM coal would be collected from the coal load out bin in the mine facilities area (refer to **Figures 2** and **3**) for transport to the CHPP.

As discussed in Section 2.1.3, 156 trucks per coal haulage day would be required to transport at the maximum coal production rate of 2Mtpa. This represents no change from the 2010 operational levels, i.e., no additional truck movements would be generated.

After suitable approvals and upgrades are in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities (expected to occur during Year 1), all of the sized ROM coal would be transported to the Boggabri Coal Mine using internal haul road links and therefore transport of sized ROM coal on the haul route would cease.

4.3.4 Domestic Specification Coal

Domestic specification coal would be collected from the mobile crushing and screening plant in the mine facilities area (refer to **Figures 2** and **3**) at a maximum rate of 150,000tpa. At this maximum transport rate, 12 trucks per coal haulage day would collect domestic specification coal from the Project. This would generate 24 truck trips per day on the road network. This represents an increase from the 2010 operational domestic specification coal levels (refer to Section 2.1.4) of five trucks per coal haulage day, generating ten truck trips per coal haulage day.

In addition to the existing haul route from Gunnedah, domestic specification coal would be transported via Kamilaroi Highway (north of Rangari Road), Rangari Road and the haul route after the commencement of Project.

The hours for the collection of domestic specification coal for the proposed Project are assumed to remain the same as the existing collection hours discussed in Section 2.1.4.

It is noted that although the movements associated with the collection of domestic specification coal are related to the TCM, these trucks are not operated by TCPL or TCPL contractors. They therefore do not form part of TCPL's operations with regard to the Project. Notwithstanding this, they have been included in this assessment as part of the future operational traffic conditions.

4.3.5 Gravel Sales

The Project would result in the collection of up to 90,000m^3 crushed gravel per annum from the mobile crushing and screening plant in the mine facilities area (refer to **Figures 2** and **3**), utilising the haul route from Gunnedah or via public roads from Boggabri, i.e., Kamilaroi Highway, Rangari Road and the haul route.

Once the collection of gravel has commenced, gravel sales are expected to generate 22 trucks per day (44 heavy vehicle trips per day), with 90 percent being to/from Narrabri, and 10 percent to/from Gunnedah.

The trucks travelling to and from Gunnedah would use the haul route, while those to and from Narrabri would use the Kamilaroi Highway, Rangari Road and the haul route to access the TCM. The truck trips would be spread evenly throughout the day, with despatch being between 7.00am and 9.15pm Monday to Friday, and between 7.00am and 5.15pm on Saturdays (excluding public holidays).

It is noted that although the movements associated with the collection of crushed gravel are related to the TCM, these trucks are not operated by TCPL or TCPL contractors. They therefore do not form part of TCPL's operations with regard to the Project. Notwithstanding this, they have been included in this assessment as part of the future operational traffic conditions.

4.3.6 Low Permeability Barrier Fill Material

Fill material (bentonite) for the construction of the low permeability barrier would be transported to the Project over a three month period in Year 12 of the Project. Fill material transport is expected to generate two trucks per day (four heavy vehicle trips per day) during this period. The trucks would use the haul route to access the Project. The truck trips would be spread evenly throughout the day, between 6.00am and 6.00pm Monday to Friday, and between 7.00am and 5.15pm on Saturdays (excluding public holidays).

Given the short-term nature (three months) and the small number of movements (four heavy vehicle trips per day), it is considered that the transport of fill material would be within the range of daily traffic variation and would have a negligible impact on the surrounding road system.

4.4 Traffic Generated by the Project – Total

Table 4.3 summarises the expected additional traffic on the roads around the TCM which would result from the Project for Year 1 (2013), and Table 4.4 summarises the expected additional traffic on the roads around the TCM which would result from the Project during Year 4 (2016) and Year 17 (2029).

Table 4.3 and Table 4.4 demonstrate that after Year 1 (2013) (or after suitable approvals and upgrades are in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities), the Project would result in a decrease in sized ROM coal haulage trips on the surrounding road system, due to the proposed movement of ROM coal internally to the Boggabri Coal Mine. Additional employees, deliveries and the sale of gravel and domestic specification coal would generate small volumes of traffic which would be more than offset by the reduction in sized ROM coal truck trips. Only small increases of up to 44 vehicles per day in Year 1 (2013), and 58 vehicles per day in Year 4 (2016) and Year 17 (2029) are predicted on all other roads.

Table 4.3 – Average Daily Project Additional Traffic Generation Year 1 (2013) (vehicles/day)

		Construction		Operational					
Site[A]	Road and Location	Workforce	Delivery and Visitor	Workforce	Delivery and Visitor	Sized ROM Coal Haulage	Domestic Specification Coal Haulage[B]	Gravel Haulage[B]	Total
	Haul Route								
1	TCM Access Rd	40	110	28	4	0	0	0	182
2	Haul Route south of Goonbri Rd	34	110	24	4	0	0	0	172
3	Blue Vale Rd south of Shannon Harbour Rd	22	88	16	3	0	-2	0	127
4	Blue Vale Rd northeast of Kamilaroi Hwy	22	88	16	3	0	-2	0	127
5	Kamilaroi Hwy btwn Blue Vale Rd and CHPP	22	88	16	3	0	0	0	129
6	CHPP Access Rd	0	0	0	0	0	0	0	0
	Other Locations								
7	Dripping Rock Rd east of Goonbri Rd	0	0	0	0	0	0	0	0
8	Goonbri Rd east of Leards Forest Rd	5	0	4	0	0	0	0	9
9	Leards Forest Rd north of Goonbri Rd	0	0	0	0	0	0	0	0
10	Barbers Lagoon Rd south of Rangari Rd	3	0	2	0	0	0	0	5
11	Rangari Rd east of Haul Route	4	0	2	0	0	0	0	6
12	Rangari Rd west of Haul Route	8	22	6	1	0	2	0	39
13	Rangari Rd east of Kamilaroi Hwy	11	22	8	1	0	2	0	44
14	Therribri Rd north of Rangari Rd	0	0	0	0	0	0	0	0
15	Shannon Harbour Rd east of Blue Vale Rd	0	0	0	0	0	0	0	0
16	Kamilaroi Hwy south of Rangari Rd	5	11	4	0	0	-2	0	18
17	Braymont Rd at Namoi River Bridge	3	0	2	0	0	0	0	5
18	Kamilaroi Hwy north of Blue Vale Rd	0	0	0	0	0	-2	0	-2

[A] Refer to Figure 1; [B] Not operated by TCPL or TCPL contractors.

Table 4.4 – Average Daily Project Additional Traffic Generation Year 4 (2016) and Year 17 (2029) (vehicles/day)

Site[A]	Road and Location	Employees	Delivery and Visitor	Sized ROM Coal Haulage	Domestic Specification Coal Haulage[B]	Gravel Haulage[B]	Total
	Haul Route						
1	TCM Access Rd	56	8	-312	10	44	-194
2	Haul Route south of Goonbri Rd	48	8	-312	10	44	-202
3	Blue Vale Rd south of Shannon Harbour Rd	30	6	-312	7	6	-263
4	Blue Vale Rd northeast of Kamilaroi Hwy	30	6	-312	7	6	-263
5	Kamilaroi Hwy btwn Blue Vale Rd and CHPP	30	6	-312	9	6	-261
6	CHPP Access Rd	0	0	-312	0	0	-312
	Other Locations						
7	Dripping Rock Rd east of Goonbri Rd	0	0	0	0	0	0
8	Goonbri Rd east of Leards Forest Rd	7	0	0	0	0	7
9	Leards Forest Rd north of Goonbri Rd	0	0	0	0	0	0
10	Barbers Lagoon Rd south of Rangari Rd	5	0	0	0	0	5
11	Rangari Rd east of Haul Route	6	0	0	0	0	6
12	Rangari Rd west of Haul Route	11	2	0	3	38	54
13	Rangari Rd east of Kamilaroi Hwy	15	2	0	3	38	58
14	Therribri Rd north of Rangari Rd	0	0	0	0	0	0
15	Shannon Harbour Rd east of Blue Vale Rd	0	0	0	0	0	0
16	Kamilaroi Hwy south of Rangari Rd	7	1	0	-2	0	6
17	Braymont Rd at Namoi River Bridge	5	0	0	0	0	5
18	Kamilaroi Hwy north of Blue Vale Rd	0	0	0	-2	0	-2

[A] Refer to Figure 1; [B] Not operated by TCPL or TCPL contractors.

4.5 Future Traffic Volumes With the Project

Table 4.5 summarises the forecast total two way average weekday daily traffic volumes on the surrounding roads with the proposed Project. This assessment includes predicted cumulative traffic from the Maules Creek Project and the Continuation of the Boggabri Coal Mine as described in Section 3.8.

Table 4.5 – Average Weekday Daily Traffic With Project (vehicles/day)

Site[A]	Road and Location	Existing[B]	2013	2016	2029
	Haul Route				
1	TCM Access Rd	564	746	370	370
2	Haul Route south of Goonbri Rd	540	713	339	339
3	Blue Vale Rd south of Shannon Harbour Rd	480	677	221	221
4	Blue Vale Rd northeast of Kamilaroi Hwy	1,515	1,743	1,318	1,452
5	Kamilaroi Hwy btwn Blue Vale Rd and CHPP	3,188	3,468	3,093	3,445
6	CHPP Access Rd	673	684	383	430
	Other Locations				
7	Dripping Rock Rd east of Goonbri Rd	21	68	97	78
8	Goonbri Rd east of Leards Forest Rd	57	113	141	123
9	Leards Forest Rd north of Goonbri Rd	311	928	1,080	897
10	Barbers Lagoon Rd south of Rangari Rd	51	128	62	68
11	Rangari Rd east of Haul Route	67	150	227	189
12	Rangari Rd west of Haul Route	637	768	876	908
13	Rangari Rd east of Kamilaroi Hwy	369	847	1,045	929
14	Therribri Rd north of Rangari Rd	62	64	144	152
15	Shannon Harbour Rd east of Blue Vale Rd	217	224	230	258
16	Kamilaroi Hwy south of Rangari Rd	2,028	2,430	2,592	2,740
17	Braymont Rd at Namoi River Bridge	122	131	134	149
18	Kamilaroi Hwy north of Blue Vale Rd	2,488	2,749	3,011	3,223

[A] Refer to Figure 1; [B]Refer to Table 3.1.

The greatest increase in cumulative forecast total two way average weekday daily traffic volumes would occur on Leards Forest Road (site 9 on **Figure 1**) which is located off key Project transport routes.

4.6 Proposed Road Realignments and New Intersections

The extent of the Project open cut and mine waste rock emplacements would require the realignment of sections of Goonbri Road and establishment of a new intersection with Dripping Rock Road to provide for continued public road accessibility around the southern and eastern extents of the Project. A plan of the proposed road realignments and new intersections is shown on **Figure 2**.

The road realignments would be undertaken progressively over the life of the Project and involve the construction of:

- a 1.4km unsealed two lane road to the south-west of the Project to facilitate construction of the new mine facilities area, including a new intersection (from the west) with the haul route;
- a 1.2km unsealed two lane road to the south of the Southern Emplacement to facilitate construction of a new internal haul road and water management infrastructure including a new intersection (from the east) with the haul route;
- a 400m unsealed two lane road realignment around the southern extent of the open cut; and
- a 2.8km unsealed two lane road from a new intersection with Dripping Rock Road and Blair Athol Lane, extending to the north and connecting with Goonbri Road to the north-east of the Project.

4.7 Assessment of Future Traffic Conditions

4.7.1 Traffic Volumes

Table 4.3 and Table 4.4 demonstrate that the Project would have only a minor impact on the future traffic volumes on the surveyed roads around the TCM. The greatest impact would be significant reductions in coal haulage trips on the haul route, with these being somewhat offset by its continued use by the various other vehicles accessing the TCM, including employees, deliveries, visitors and gravel haulage trucks.

It is considered that detailed assessment of peak hour intersection performance is not required, due to the relatively small hourly traffic volumes on the relevant roads and the small changes to traffic volumes expected as a result of the Project. In addition, the slightly staggered morning and afternoon peak hours associated with the Continuation of the Boggabri Coal Mine, the Maules Creek Project and the Project and the different traffic distributions associated with these developments would assist in minimising potential cumulative peak hour impacts.

4.7.2 Road System Efficiency

With surveyed peak hourly volumes being typically 8 to 12% of the daily volumes (refer to Table 3.2) it is evident from Table 4.5 that future peak hour volumes on the surveyed roads are likely to remain well below 550 vehicles per hour on Kamilaroi Highway and below 650 vehicles per hour on all other surveyed roads. On this basis, as discussed in Section 3.3.4, the future LOS on all of the surveyed roads would remain A, which is satisfactory.

The haul route currently carries an average 312 heavy vehicle movements per haulage day directly associated with transport of up to 2Mtpa of sized ROM coal to the CHPP. The Project would result in the cessation of sized ROM coal transport on the road network i.e., a reduction of 312 heavy vehicle movements per haulage day. Allowing for public holidays and the like, it is estimated that the sized ROM coal trucks use this route six days a week for 50 weeks of the year. The existing annual Vehicle Kilometres Travelled (VKT) of the sized ROM coal trucks is thus 3.6 million vehicle kilometres per year. The internal movement of sized ROM coal to the Boggabri Coal Mine would therefore result in a reduction of 3.6 million heavy vehicle kilometres on the haul route per year.

It should be noted however, that domestic specification coal would be transported from the Project at a maximum rate of 150,000tpa, or 12 heavy vehicle movements per haulage day. In addition, an additional 22 heavy vehicle movements per haulage day would transport gravel from the Project. As these movements would include direct collection by customers, the VKT associated with these movements would vary according to individual origins and destinations. However, it is unlikely that the increase in VKT associated with the transport of 150,000t of domestic specification coal and 90,000m^3 of gravel would outweigh the reduction in VKT associated with the transport of 2Mt of sized ROM coal between the TCM and the CHPP.

The reduction in travel by sized ROM coal trucks would improve the efficiency of haul route for the remaining road users, through the removal of the slower-moving trucks from the road system. The reduction in truck-generated VKT would also have some benefits in terms of reducing fuel consumption and exhaust pollution.

4.7.3 Haul Route Intersections with Kamilaroi Highway

The haul route intersects with Kamilaroi Highway at two locations, these being at the CHPP access road, and at the intersection with Blue Vale Road. The two intersections are both tee intersections, with Kamilaroi Highway being the main road with priority.

The intersections are both constructed to a good standard, with deceleration and acceleration lanes to accommodate the slower moving coal trucks with minimum disruption to other traffic. The limited additional traffic generated by the Project along the haul route would not warrant any upgrading of these intersections.

4.7.4 Road Realignments and New Intersections

The proposed realignments of roads to the south and east of the Project would maintain all existing access for through traffic, as well as access for the Project itself.

The new intersection formed between the haul route and Goonbri Road would be a four-way intersection. Goonbri Road would have priority at the intersection, i.e., traffic on the haul route would have to give way to traffic on the public road.

The new intersection of Goonbri Road, Dripping Rock Road and Blair Athol Lane would be a four way intersection. Priority at the intersection would follow standard road rules, with traffic on the minor road being required to give way to traffic on the through road.

The new sections of road and intersection would be designed to the same standard as the existing roads, and in accordance with the requirements of Narrabri Shire Council and the RTA's (1996) *Road Design Guide*.

No RTA Works Authorisation Deed would be required for the proposed works on Goonbri Road as they would be on Narrabri Shire Council roads.

4.7.5 Blasting

During mining operations there would be occasions when blasting would be required within 500m of Goonbri Road. Approvals would be sought from the Narrabri Shire Council to temporarily close sections of Goonbri Road to allow blasting to occur, typically for periods of approximately 15 minutes.

It is recommended that a Road Closure Management Plan be established in consultation with the Narrabri Shire Council defining:

- method of road closure;
- signage providing advance warning and at the end of the road closure;
- review of traffic volumes;
- period of closure and expected queue lengths;
- access for emergency services during closure periods;
- notification process; and
- monitoring and reporting requirements.

4.7.6 Road Safety Review

As the increases in traffic resulting from the Project would be minimal, with significant reductions in heavy vehicle movements on the haul route, and no particular accident pattern or causation factors were identified in the local area, it follows that no significant road safety issues are anticipated as a result of the Project.

4.7.7 School Buses

Based upon shift times, the Project's morning peak would occur between 6.00am and 7.00am and afternoon peak would occur between 5.00pm and 7.00pm. These times are outside the periods that local school buses operate (refer to Section 3.7). The potential for conflict between Project traffic and school buses is therefore minimised. Notwithstanding, some off peak Project traffic would be present on the local road network during the school bus operating hours.

In addition, the Project would result in the cessation of sized ROM coal haulage trips on the haul route due to the proposed movement of coal internally to the Boggabri Coal Mine after suitable approvals and upgrades are in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities (expected to occur during Year 1 of the Project).

The road diversions resulting from the Project would not affect the operation of school buses in the area, as all through access by public vehicles on the public roads would be maintained.

4.7.8 Oversize Vehicles

A number of oversize vehicle movements would be generated on an occasional basis during the life of the Project. These oversize vehicle movements would be associated with the transport of mining equipment and infrastructure to and from the Project.

Although the number of oversize vehicle movements associated with the Project is anticipated to be small, the requirement for each proposed oversize vehicle movement would be reviewed and alternative transport options, such as rail, would be considered prior to the movement.

It is expected that oversize vehicles would approach the Project via Kamilaroi Highway and the haul route. Notwithstanding the above, the proposed route would be negotiated with RTA and relevant local councils on a case-by-case basis. Oversize vehicles would be unloaded in the vicinity of the mine facilities area.

All oversize loads would be transported with the relevant permits obtained in accordance with *Operating Conditions: specific permits for oversize and over-mass vehicles and loads* (RTA, 2007), and any other licences and escorts as required by the regulatory authorities.

4.7.9 Car Parking

During the construction stage, car parking facilities at the existing mine facilities area and temporary parking in the vicinity of the mine facilities area would be utilised.

Car parking for employees and visitors during operational stages would be located in the mine facilities area (refer to **Figures 2** and **3**).

4.7.10 Potential Road Noise and Dust Impacts

Potential road noise and dust impacts have been assessed in the Noise and Blasting Impact Assessment (Appendix C of the Environmental Assessment) and the Air Quality and Greenhouse Gas Assessment (PAE Holmes, 2011) (Appendix D of the Environmental Assessment) respectively.

5 Conclusions

This study has found that the extension of the life of the TCM and expansion of its production capacity would have only minor impacts on the operation of the surrounding road system. The Project would result in the cessation of sized ROM coal haulage trips from the TCM to the CHPP due to the proposed movement of ROM coal internally to the Boggabri Coal Mine after suitable approvals and upgrades are in place for the transfer of Project ROM coal to the Boggabri Coal Mine Infrastructure Facilities (expected to occur during Year 1). Additional employees, deliveries and the sale of gravel would generate small volumes of traffic which would be more than offset by the reduction in sized ROM coal truck trips.

No significant impacts on the performance, capacity, efficiency and safety of the road network are expected to arise as a result of the Project and no specific management or mitigation measures are considered to be warranted.

Attachment A. Traffic Survey Data

Site 1: Tarrawonga Coal Mine Access Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	2	0	0	1	0
1:00	0	1	1	0	0	3	0	0	2	1
2:00	0	13	13	13	13	9	0	10	5	10
3:00	0	2	0	0	1	0	0	1	0	1
4:00	0	1	1	1	3	0	1	1	1	1
5:00	3	13	9	13	13	5	2	10	4	9
6:00	43	39	57	54	55	42	8	50	25	43
7:00	30	35	33	29	36	22	8	33	15	27
8:00	39	40	44	38	49	26	2	42	14	33
9:00	28	41	39	30	37	25	5	35	15	30
10:00	43	49	42	34	29	21	3	39	12	30
11:00	31	34	32	19	29	25	2	29	14	24
12:00	31	38	35	34	30	36	3	34	20	29
13:00	35	43	64	30	32	26	1	41	14	33
14:00	41	26	23	15	23	26	2	26	14	19
15:00	58	42	35	32	30	4	6	39	5	25
16:00	66	71	48	67	71	0	0	65	0	43
17:00	30	33	30	28	31	4	0	30	2	21
18:00	29	34	29	34	30	9	6	31	8	24
19:00	22	24	22	22	20	0	2	22	1	15
20:00	18	20	22	22	19	1	0	20	1	14
21:00	8	7	5	5	2	1	0	5	1	3
22:00	1	0	0	0	1	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0
Total	**556**	**606**	**584**	**520**	**554**	**287**	**51**	**564**	**169**	**434**

Site 2: Haul Route - South of Dripping Rock Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	0	0	0	0
1:00	0	1	1	0	0	0	0	0	0	0
2:00	0	12	10	9	10	9	0	8	5	8
3:00	0	3	0	0	1	0	0	1	0	1
4:00	0	0	2	1	3	1	1	1	1	1
5:00	8	14	11	14	12	8	5	12	7	11
6:00	43	33	47	41	44	33	5	42	19	34
7:00	35	36	36	28	36	22	7	34	15	28
8:00	39	43	43	39	46	27	4	42	16	34
9:00	30	43	38	31	36	25	6	36	16	30
10:00	53	48	42	38	29	21	6	42	14	31
11:00	32	33	32	20	27	27	1	29	14	23
12:00	32	38	31	34	30	33	12	33	23	30
13:00	35	41	56	28	30	24	2	38	13	30
14:00	42	27	21	17	21	23	2	26	13	19
15:00	58	44	37	35	29	4	5	41	5	26
16:00	41	62	44	58	55	3	1	52	2	37
17:00	36	31	27	26	32	7	4	30	6	21
18:00	28	32	28	29	29	7	5	29	6	22
19:00	20	21	19	22	18	1	2	20	2	14
20:00	17	18	21	20	18	1	2	19	2	13
21:00	7	9	4	5	2	0	0	5	0	3
22:00	0	1	0	0	1	0	0	0	0	0
23:00	0	0	0	0	0	2	0	0	1	0
Total	**556**	**590**	**550**	**495**	**509**	**278**	**70**	**540**	**174**	**415**

Site 3: Bluevale Road - South of Shannon Harbour Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	14-Feb-11	08-Feb-11	9-Feb-11	10-Feb-11	11-Feb-11	12-Feb-11	13-Feb-11	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	1	2	0	2	1
1:00	1	0	0	0	0	1	3	0	2	1
2:00	0	7	7	7	7	6	0	6	3	6
3:00	1	0	0	0	0	0	0	0	0	0
4:00	5	6	4	5	5	2	1	5	2	4
5:00	11	18	25	25	21	19	7	20	13	19
6:00	55	31	37	46	48	22	11	43	17	33
7:00	55	19	24	40	57	25	4	39	15	28
8:00	41	22	12	32	36	8	2	29	5	19
9:00	44	12	12	30	45	10	3	29	7	19
10:00	37	17	24	22	55	36	5	31	21	27
11:00	33	10	18	18	65	22	4	29	13	23
12:00	44	20	11	17	42	5	5	27	5	17
13:00	40	21	17	14	43	10	5	27	8	18
14:00	51	17	13	22	49	12	4	30	8	20
15:00	51	20	26	29	47	12	1	35	7	23
16:00	50	34	40	38	52	6	6	43	6	29
17:00	47	29	35	30	48	9	8	38	9	27
18:00	27	12	11	19	38	12	5	21	9	16
19:00	14	6	6	9	22	3	4	11	4	8
20:00	18	1	2	2	19	3	0	8	2	5
21:00	15	3	2	5	7	4	0	6	2	4
22:00	1	4	1	1	2	2	0	2	1	2
23:00	1	1	0	3	1	0	0	1	0	1
Total	**642**	**310**	**327**	**414**	**709**	**230**	**80**	**480**	**155**	**345**

Site 4: Bluevale Road - Northeast of Kamilaroi Highway

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	8-Nov-10	9-Nov-10	10-Nov-10	4-Nov-10	5-Nov-10	6-Nov-10	7-Nov-10	*Ave.*	*Ave.*	*Ave*
0:00	0	1	5	2	1	0	1	2	1	1
1:00	0	1	3	1	0	1	0	1	1	1
2:00	0	11	9	10	14	11	0	9	6	9
3:00	1	5	2	4	5	3	0	3	2	3
4:00	5	8	11	3	4	2	0	6	1	2
5:00	40	42	39	38	42	31	3	40	17	29
6:00	33	46	51	54	51	45	7	47	26	39
7:00	70	120	117	89	149	90	8	109	49	84
8:00	86	89	104	133	117	94	7	106	51	88
9:00	78	103	94	95	93	100	5	93	53	73
10:00	99	90	88	98	105	94	10	96	52	77
11:00	87	88	100	99	124	103	5	100	54	83
12:00	107	96	72	115	92	81	14	96	48	76
13:00	85	106	121	106	102	86	5	104	46	75
14:00	98	103	93	122	93	106	8	102	57	82
15:00	102	135	102	115	116	80	17	114	49	82
16:00	105	95	85	105	91	39	15	96	27	63
17:00	104	123	116	96	86	11	11	105	11	51
18:00	56	68	58	82	96	10	17	72	14	51
19:00	76	80	52	73	81	1	9	72	5	41
20:00	84	92	85	57	63	5	1	76	3	32
21:00	43	54	43	53	66	3	1	52	2	31
22:00	11	10	8	12	12	1	1	11	1	7
23:00	4	1	0	3	7	0	0	3	0	3
Total	**1374**	**1567**	**1458**	**1565**	**1610**	**997**	**145**	**1515**	**571**	**1079**

Site 5: Kamilaroi Highway - between Blue Vale Road & CHPP

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	7-Dec-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	9	9	8		14	6	9	10	9	9
1:00	2	6	8		9	3	5	6	5	6
2:00	3	17	15		15	18	7	13	7	14
3:00	3	11	7		12	7	5	8	5	8
4:00	9	18	26		27	9	10	20	10	18
5:00	70	105	85		89	38	14	87	14	57
6:00	109	106	126		109	46	33	113	33	79
7:00	165	188	234		196	91	46	196	46	142
8:00	218	232	235		248	164	83	233	83	183
9:00	192	203	231		219	191	82	211	82	181
10:00	199	193	262	233	210	258	136	219	136	220
11:00	190	204	207	201	216	187	138	204	138	190
12:00	190	192	212	201	208	174	123	201	123	184
13:00	231	204	217	224	212	154	132	218	132	188
14:00	219	211	274	236	240	181	148	236	148	216
15:00	248	222	252	236	263	164	115	244	115	206
16:00	250	229	231	236	243	125	177	238	177	202
17:00	235	244	208	236	245	140	137	234	137	193
18:00	174	153	155	174	183	106	105	168	105	145
19:00	112	107	105	114	139	60	85	115	85	101
20:00	80	74		93	82	28	45	82	45	62
21:00	76	68		72	68	35	29	71	29	51
22:00	35	28		38	53	25	25	39	25	35
23:00	16	15		28	32	16	13	23	13	22
Total	**3035**	**3039**	**3098**	**2322**	**3332**	**2226**	**1702**	**3188**	**1702**	**2709**

Site 6: CHPP Access Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	2	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0
3:00	2	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0
5:00	0	0	2	1	1	0	0	1	0	1
6:00	3	0	11	7	9	2	0	6	1	5
7:00	60	12	72	60	55	21	0	52	11	37
8:00	44	68	55	34	37	25	0	48	13	37
9:00	42	66	62	41	45	24	1	51	13	40
10:00	52	37	64	48	45	23	3	49	13	37
11:00	40	59	47	46	35	18	2	45	10	35
12:00	48	64	72	47	45	22	0	55	11	42
13:00	54	57	57	42	43	24	1	51	13	37
14:00	40	51	51	33	40	22	1	43	12	33
15:00	42	63	52	34	39	12	1	46	7	34
16:00	31	59	47	38	43	0	1	44	1	31
17:00	59	58	56	57	45	0	0	55	0	36
18:00	40	41	32	36	31	0	0	36	0	23
19:00	37	35	28	25	36	0	0	32	0	21
20:00	38	27	27	32	22	0	0	29	0	18
21:00	32	31	26	33	20	0	0	28	0	18
22:00	0	0	1	0	1	0	0	0	0	0
23:00	2	0	0	2	0	0	0	1	0	0
Total	**666**	**728**	**762**	**618**	**592**	**193**	**10**	**673**	**102**	**484**

Site 7: Dripping Rock Road - East of Goonbri Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0
3:00	0	1	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0
5:00	1	1	0	1	1	0	0	1	0	1
6:00	0	2	2	1	1	2	0	1	1	1
7:00	1	2	1	0	0	0	0	1	0	1
8:00	0	3	2	2	2	0	0	2	0	2
9:00	0	2	1	0	0	0	0	1	0	1
10:00	2	2	1	4	1	0	0	2	0	1
11:00	0	2	2	0	0	0	0	1	0	1
12:00	2	2	2	0	0	1	0	1	1	1
13:00	2	1	0	5	2	0	2	2	1	2
14:00	2	3	0	0	0	0	0	1	0	1
15:00	2	1	0	1	4	0	0	2	0	1
16:00	2	1	2	2	4	0	1	2	1	2
17:00	3	2	2	3	6	1	0	3	1	2
18:00	0	1	0	0	3	0	0	1	0	1
19:00	2	0	0	0	0	0	0	0	0	0
20:00	0	0	0	1	0	0	0	0	0	0
21:00	0	1	0	0	0	0	0	0	0	0
22:00	0	0	1	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0
Total	**19**	**27**	**16**	**20**	**24**	**4**	**3**	**21**	**4**	**16**

Site 8: Goonbri Road - East of Leards Forest Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	3	0	0	2	1
2:00	0	3	3	3	3	0	0	2	0	2
3:00	0	2	0	0	0	0	0	0	0	0
4:00	0	1	1	0	0	1	0	0	1	1
5:00	7	7	5	5	7	5	3	6	4	5
6:00	5	6	7	10	7	5	3	7	4	6
7:00	5	4	2	5	1	0	0	3	0	2
8:00	2	4	2	1	4	1	2	3	2	2
9:00	1	3	2	3	0	0	4	2	2	2
10:00	5	7	3	0	1	0	3	3	2	2
11:00	2	2	0	2	2	0	1	2	1	1
12:00	2	0	3	3	0	2	2	2	2	2
13:00	2	3	6	2	1	0	0	3	0	2
14:00	5	3	1	0	1	0	0	2	0	1
15:00	1	2	2	1	3	0	0	2	0	1
16:00	7	9	6	12	8	1	1	8	1	6
17:00	10	5	4	2	9	1	2	6	2	4
18:00	2	2	3	2	8	5	1	3	3	4
19:00	1	0	0	0	0	1	0	0	1	0
20:00	0	1	0	1	0	1	2	0	2	1
21:00	0	1	0	0	3	0	0	1	0	1
22:00	0	1	1	0	0	1	0	0	1	1
23:00	0	0	0	0	0	0	0	0	0	0
Total	**57**	**66**	**51**	**52**	**58**	**27**	**24**	**57**	**26**	**46**

Site 9: Leards Forest Road - North of Dripping Rock Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	2	0	1	0	2	0	1	1	1
1:00	0	4	1	0	0	11	1	1	6	3
2:00	0	6	1	0	5	4	1	2	3	3
3:00	0	18	0	0	1	0	0	4	0	3
4:00	3	5	5	15	20	2	0	10	1	8
5:00	20	52	58	53	56	18	11	48	15	41
6:00	21	30	25	30	19	7	6	25	7	20
7:00	16	22	22	17	17	2	2	19	2	14
8:00	14	7	5	11	14	4	3	10	4	7
9:00	5	12	9	10	8	1	8	9	5	8
10:00	12	15	13	11	12	0	10	13	5	10
11:00	7	14	20	15	10	4	3	13	4	11
12:00	7	10	19	8	19	3	5	13	4	11
13:00	9	15	8	7	9	2	8	10	5	8
14:00	14	9	4	9	11	1	7	9	4	7
15:00	20	20	17	16	14	5	4	17	5	13
16:00	32	48	33	40	36	7	11	38	9	29
17:00	40	36	37	53	39	8	19	41	14	32
18:00	15	17	21	20	17	8	2	18	5	14
19:00	5	3	2	2	3	5	1	3	3	3
20:00	3	10	0	0	0	3	10	3	7	4
21:00	0	6	4	0	4	0	0	3	0	2
22:00	1	3	0	0	0	1	0	1	1	1
23:00	1	0	6	0	2	1	0	2	1	2
Total	**245**	**364**	**310**	**318**	**316**	**99**	**112**	**311**	**106**	**253**

Site 10: Barbers Lagoon Road - South of Rangari Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0
5:00	3	1	3	2	3	0	0	2	0	2
6:00	1	0	2	0	2	3	0	1	2	1
7:00	2	3	3	0	6	2	2	3	2	3
8:00	2	3	4	3	10	6	0	4	3	4
9:00	4	3	4	1	4	6	3	3	5	4
10:00	2	0	0	2	4	2	4	2	3	2
11:00	4	2	4	0	4	3	2	3	3	3
12:00	8	3	2	1	1	0	1	3	1	1
13:00	2	0	3	2	7	0	9	3	5	4
14:00	4	4	4	6	4	2	1	4	2	4
15:00	8	4	8	4	3	1	0	5	1	3
16:00	6	6	2	4	2	4	3	4	4	4
17:00	9	3	1	6	8	1	8	5	5	5
18:00	3	3	2	4	4	2	1	3	2	3
19:00	2	1	1	3	3	3	2	2	3	2
20:00	1	1	1	0	3	0	3	1	2	1
21:00	0	2	1	1	0	1	0	1	1	1
22:00	1	1	0	0	0	0	0	0	0	0
23:00	1	0	0	0	0	1	1	0	1	0
Total	**63**	**40**	**45**	**39**	**68**	**37**	**40**	**51**	**39**	**45**

Site 11: Rangari Road - East of Haul Route

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	7-Dec-10	01-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	0	0	0	0
1:00	0	1	1	0	0	1	1	0	1	1
2:00	0	2	2	2	2	2	0	2	1	2
3:00	0	0	0	1	0	0	0	0	0	0
4:00	1	1	0	0	2	0	0	1	0	0
5:00	1	3	2	3	4	1	0	3	1	2
6:00	7	5	9	8	9	6	0	8	3	6
7:00	4	5	2	5	3	0	1	4	1	2
8:00	4	1	3	5	3	4	0	3	2	3
9:00	3	2	4	5	4	3	3	4	3	4
10:00	3	2	3	2	4	4	2	3	3	3
11:00	4	1	2	4	2	3	3	3	3	3
12:00	3	2	4	2	1	5	5	2	5	3
13:00	3	1	3	4	8	2	1	4	2	4
14:00	1	1	3	3	2	2	1	2	2	2
15:00	9	1	5	9	2	4	5	5	5	5
16:00	6	7	7	8	4	1	2	6	2	4
17:00	8	6	6	6	8	2	7	7	5	6
18:00	7	4	5	8	10	5	1	7	3	6
19:00	2	1	3	2	1	3	2	2	3	2
20:00	1	3	1	2	0	0	2	1	1	1
21:00	0	0	1	0	0	1	0	0	1	0
22:00	0	0	2	0	2	0	0	1	0	1
23:00	0	1	0	0	0	1	1	0	1	0
Total	**67**	**50**	**68**	**79**	**71**	**50**	**37**	**67**	**44**	**61**

Site 12: Rangari Road - West of Haul Route

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	31-Jan-11	1-Feb-11	2-Feb-11	3-Feb-11	28-Jan-11	29-Jan-11	30-Jan-11	*Ave.*	*Ave.*	*Ave*
0:00	0	1	4	0	0	1	2	1	2	1
1:00	0	0	0	1	1	0	3	0	2	1
2:00	0	10	10	10	13	12	1	9	7	9
3:00	1	0	0	1	2	0	1	1	1	1
4:00	2	6	10	11	7	5	2	7	4	5
5:00	19	17	23	23	14	12	8	19	10	11
6:00	45	45	55	43	46	32	8	47	20	29
7:00	35	52	39	53	34	18	6	43	12	19
8:00	39	36	43	31	31	30	11	36	21	24
9:00	38	44	42	29	22	32	7	35	20	20
10:00	39	38	40	38	30	27	8	37	18	22
11:00	52	34	45	35	40	31	6	41	19	26
12:00	39	48	34	36	37	17	2	39	10	19
13:00	37	34	38	31	35	28	7	35	18	23
14:00	38	33	24	25	40	27	8	32	18	25
15:00	41	41	48	32	39	21	7	40	14	22
16:00	66	61	63	55	56	3	11	60	7	23
17:00	58	61	62	61	44	18	11	57	15	24
18:00	45	43	39	37	34	12	12	40	12	19
19:00	23	28	25	31	27	7	5	27	6	13
20:00	16	25	30	19	20	8	2	22	5	10
21:00	8	9	6	11	6	3	3	8	3	4
22:00	0	1	1	2	0	0	1	1	1	0
23:00	0	0	1	0	0	0	0	0	0	0
Total	**641**	**667**	**682**	**615**	**578**	**344**	**132**	**637**	**238**	**351**

Site 13: Rangari Road - East of Kamilaroi Highway

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	1	1	5	0	0	2	1	1	2
1:00	0	5	3	0	0	1	0	2	1	2
2:00	0	10	5	3	9	4	0	5	2	5
3:00	0	14	0	0	1	0	0	3	0	3
4:00	2	8	7	14	17	0	0	10	0	8
5:00	0	52	55	51	58	10	3	43	7	38
6:00	12	33	31	38	36	6	6	30	6	25
7:00	0	19	24	26	26	0	12	19	6	18
8:00	2	19	13	18	28	5	6	16	6	15
9:00	2	30	23	20	20	0	10	19	5	17
10:00	12	16	19	21	18	4	6	17	5	14
11:00	2	30	18	10	21	8	7	16	8	16
12:00	8	21	23	8	27	6	3	17	5	15
13:00	2	27	15	19	24	15	6	17	11	18
14:00	0	13	21	21	19	8	2	15	5	14
15:00	0	30	21	22	34	8	6	21	7	20
16:00	2	52	48	55	44	7	4	40	6	35
17:00	0	39	45	56	53	12	12	39	12	36
18:00	0	25	25	26	26	9	9	20	9	20
19:00	0	10	4	8	12	0	15	7	8	8
20:00	0	6	1	3	5	0	6	3	3	4
21:00	0	11	5	2	1	0	0	4	0	3
22:00	0	4	5	0	3	2	2	2	2	3
23:00	0	0	2	0	2	0	0	1	0	1
Total	**44**	**475**	**414**	**426**	**484**	**105**	**117**	**369**	**111**	**337**

Site 14: Therribri Road - North of Rangari Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	1	0	0	1	0
2:00	0	0	1	0	1	0	0	0	0	0
3:00	0	0	0	1	0	0	0	0	0	0
4:00	0	0	0	1	0	0	0	0	0	0
5:00	3	3	1	0	0	1	0	1	1	1
6:00	4	1	1	0	0	1	0	1	1	1
7:00	2	2	6	4	5	4	0	4	2	4
8:00	2	7	5	5	4	4	6	5	5	5
9:00	1	6	10	4	6	5	7	5	6	6
10:00	4	4	4	5	4	5	5	4	5	5
11:00	4	5	3	0	4	4	3	3	4	3
12:00	2	7	4	2	3	0	4	4	2	3
13:00	5	8	7	0	8	0	4	6	2	5
14:00	1	4	9	1	9	8	9	5	9	7
15:00	2	5	5	7	13	1	4	6	3	6
16:00	1	2	3	7	3	3	7	3	5	4
17:00	5	6	4	4	7	5	1	5	3	5
18:00	6	8	5	5	1	1	5	5	3	4
19:00	1	1	0	1	6	3	1	2	2	2
20:00	0	1	0	0	4	2	3	1	3	2
21:00	0	0	1	2	0	1	0	1	1	1
22:00	0	0	2	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0
Total	**43**	**70**	**71**	**49**	**78**	**49**	**59**	**62**	**54**	**63**

Site 15: Shannon Harbour Road - East of Blue Vale Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	14-Feb-11	08-Feb-11	9-Feb-11	10-Feb-11	11-Feb-11	12-Feb-11	13-Feb-11	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	1	0	1	0
1:00	0	0	1	0	0	0	1	0	1	0
2:00	0	1	1	1	1	1	0	1	1	1
3:00	0	1	1	1	1	1	0	1	1	1
4:00	0	1	0	0	0	0	0	0	0	0
5:00	3	4	6	5	5	1	1	5	1	4
6:00	14	11	11	14	15	7	6	13	7	11
7:00	22	7	7	9	28	4	1	15	3	9
8:00	30	5	6	8	22	2	2	14	2	8
9:00	40	6	8	13	25	4	3	18	4	10
10:00	30	2	9	12	33	13	2	17	8	12
11:00	30	3	5	8	36	17	0	16	9	12
12:00	31	2	4	11	17	4	1	13	3	7
13:00	32	1	5	4	19	3	6	12	5	6
14:00	18	6	1	6	21	5	5	10	5	7
15:00	27	8	6	11	27	3	2	16	3	10
16:00	30	10	5	15	26	3	0	17	2	10
17:00	31	3	3	5	20	0	0	12	0	5
18:00	34	8	6	6	19	4	0	15	2	7
19:00	15	2	1	2	12	1	0	6	1	3
20:00	33	0	1	0	14	0	0	10	0	3
21:00	16	0	0	1	5	1	0	4	1	1
22:00	0	0	0	2	0	0	0	0	0	0
23:00	1	0	0	0	1	0	0	0	0	0
Total	**437**	**81**	**87**	**134**	**347**	**74**	**31**	**217**	**53**	**126**

Site 16: Kamilaroi Highway - South of Rangari Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00	4	10	13	7	11	7	13	9	10	10
1:00	4	7	4	6	6	4	5	5	5	5
2:00	5	10	5	6	15	6	1	8	4	7
3:00	2	19	7	6	7	7	3	8	5	8
4:00	7	17	18	16	25	3	10	17	7	15
5:00	59	66	72	78	86	28	12	72	20	57
6:00	103	76	98	94	102	49	29	95	39	75
7:00	123	118	117	119	131	75	51	122	63	102
8:00	133	156	132	158	153	93	61	146	77	126
9:00	129	134	137	146	142	102	75	138	89	123
10:00	104	152	159	130	134	125	83	136	104	131
11:00	132	157	125	127	125	101	94	133	98	122
12:00	108	128	127	125	154	108	96	128	102	123
13:00	105	148	118	149	132	120	91	130	106	126
14:00	134	130	154	137	134	99	100	138	100	126
15:00	148	151	121	147	154	82	94	144	88	125
16:00	125	159	158	164	163	89	139	154	114	145
17:00	134	170	145	151	167	121	115	153	118	145
18:00	99	121	104	120	120	75	90	113	83	105
19:00	53	53	62	70	64	32	62	60	47	57
20:00	33	43	36	46	47	26	50	41	38	41
21:00	31	30	44	29	33	14	23	33	19	29
22:00	24	28	26	16	19	19	17	23	18	21
23:00	14	11	22	27	32	6	11	21	9	18
Total	**1813**	**2094**	**2004**	**2074**	**2156**	**1391**	**1325**	**2028**	**1358**	**1841**

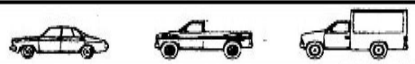
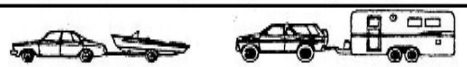
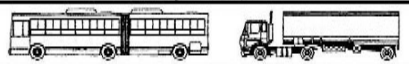
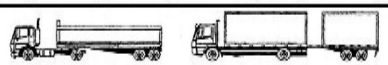
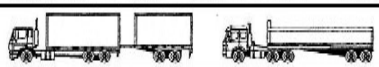
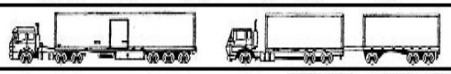
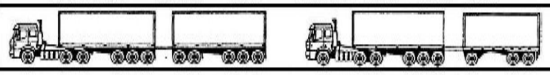
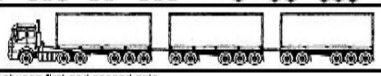
Site 17: Braymont Road - at Namoi River Bridge

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	6-Dec-10	30-Nov-10	1-Dec-10	2-Dec-10	3-Dec-10	4-Dec-10	5-Dec-10	*Ave.*	*Ave.*	*Ave*
0:00		0	0	0	0			0		
1:00		0	0	0	0			0		
2:00		0	0	0	0			0		
3:00		0	0	0	0			0		
4:00		0	0	0	0			0		
5:00		5	8	3	1			4		
6:00		2	2	1	4			2		
7:00		3	8	15	5			8		
8:00		10	17	16	10			13		
9:00		3	7	10	2			6		
10:00		6	2	4	5			4		
11:00		7	3	3	15			7		
12:00		9	4	7	5			6		
13:00		2	5	11	1			5		
14:00		10	11	10	7			10		
15:00		10	19	18	2			12		
16:00		14	21	19	6			15		
17:00		20	15	13	12			15		
18:00		4	8	13	2			7		
19:00		0	5	7	5			4		
20:00		4	4	3	1			3		
21:00		2	2	0	1			1		
22:00		0	0	0	0			0		
23:00		0	0	0	0			0		
Total		**111**	**141**	**153**	**84**			**122**		

Site 18: Kamilaroi Highway - North of Blue Vale Road

Day	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*W/Day*	*W/End*	*7 Day*
Time	11-Oct-10	12-Oct-10	13-Oct-10	7-Oct-10	8-Oct-10	9-Oct-10	10-Oct-10	*Ave.*	*Ave.*	*Ave*
0:00	17	7	12	6	11	12	5	11	9	9
1:00	5	3	8	8	7	10	6	6	8	8
2:00	6	6	6	9	4	13	5	6	9	8
3:00	13	10	17	12	13	8	8	13	8	10
4:00	21	23	25	20	22	19	10	22	15	18
5:00	74	86	98	98	85	43	26	88	35	63
6:00	128	115	118	93	96	53	34	110	44	69
7:00	147	150	168	140	133	107	59	148	83	110
8:00	146	190	185	164	156	132	87	168	110	135
9:00	169	172	167	203	184	167	126	179	147	170
10:00	160	158	162	177	164	146	142	164	144	157
11:00	172	151	186	189	166	166	132	173	149	163
12:00	151	125	157	201	168	157	178	160	168	176
13:00	159	181	171	178	181	171	149	174	160	170
14:00	153	159	161	174	203	126	166	170	146	167
15:00	186	160	216	177	213	143	157	190	150	173
16:00	203	166	217	229	194	122	123	202	123	167
17:00	179	180	195	206	196	110	108	191	109	155
18:00	109	107	118	133	131	87	85	120	86	109
19:00	80	64	55	68	89	55	56	71	56	67
20:00	49	46	35	31	60	45	50	44	48	47
21:00	32	30	41	34	36	23	26	35	25	30
22:00	18	20	24	33	25	24	17	24	21	25
23:00	22	12	18	22	20	7	7	19	7	14
Total	**2399**	**2321**	**2560**	**2605**	**2557**	**1946**	**1762**	**2488**	**1854**	**2218**

AUSTROADS Vehicle Classification System

Level 1	Level 2		Level 3	AUSTROADS Classification		
Length (Indicative)	Axles and Axle Groups		Vehicle Type			
Type	Axles	Groups	Typical Description	Class	Parameters	Typical Configuration
	LIGHT VEHICLES					
Short up to 5.5m		1 or 2	**Short** Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc	1	d(1) ≤ 3.2m and axles = 2	
Medium 5.5m to 14.5m	3, 4 or 5	3	**Short - Towing** Trailer, Caravan, Boat, etc	2	groups = 3 d(1) ≥ 2.1m, d(1) ≤ 3.2m, d(2) ≥ 2.1m and axles = 3, 4 or 5	
	HEAVY VEHICLES					
	2	2	**Two Axle Truck or Bus**	3	d(1) > 3.2m and axles = 2	
	3	2	**Three Axle Truck or Bus**	4	axles = 3 and groups = 2	
	> 3	2	**Four Axle Truck**	5	axles > 3 and groups = 2	
Long 11.5m to 19.0m	3	3	**Three Axle Articulated** Three axle articulated vehicle, or Rigid vehicle and trailer	6	d(1) > 3.2m, axles = 3 and groups = 3	
	4	> 2	**Four Axle Articulated** Four axle articulated vehicle, or Rigid vehicle and trailer	7	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 4 and groups > 2	
	5	> 2	**Five Axle Articulated** Five axle articulated vehicle, or Rigid vehicle and trailer	8	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 5 and groups > 2	
	≥ 6	> 2	**Six Axle Articulated** Six axle articulated vehicle, or Rigid vehicle and trailer	9	axles = 6 and groups > 2 or axles > 6 and groups = 3	
Medium Combination 17.5m to 36.5m	> 6	4	**B Double** B Double, or Heavy truck and trailer	10	groups = 4 and axles > 6	
	> 6	5 or 6	**Double Road Train** Double road train, or Medium articulated vehicle and one dog trailer (M.A.D.)	11	groups = 5 or 6 and axles > 6	
Large Combination Over 33.0m	> 6	> 6	**Triple Road Train** Triple road train, or Heavy truck and three trailers	12	groups > 6 and axles > 6	

Definitions:
Group: Axle group, where adjacent axles are less than 2.1m apart
Groups: Number of axle groups
Axles: Number of axles (maximum axle spacing of 10.0m)

d(1): Distance between first and second axle
d(2): Distance between second and third axle

Attachment B. Roads and Traffic Authority Crash Data

Summary Crash Report

# Crash Type		
Car Crash	34	54.0%
Light Truck Crash	16	25.4%
Rigid Truck Crash	6	9.5%
Articulated Truck Crash	16	25.4%
'Heavy Truck Crash	(21)	(33.3%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(21)	(33.3%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	4	6.3%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

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

Location Type		
*Intersection	6	9.5%
Non intersection	57	90.5%

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

Collision Type		
Single Vehicle	46	73.0%
Multi Vehicle	17	27.0%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	35	55.6%
Other Classified Road	6	9.5%
Unclassified Road	22	34.9%

Contributing Factors		
Speeding	18	28.6%
Fatigue	10	15.9%
Alcohol	4	6.3%

Weather		
Fine	54	85.7%
Rain	2	3.2%
Overcast	5	7.9%
Fog or mist	1	1.6%
Other	0	0.0%

Road Surface Condition		
Wet	5	7.9%
Dry	58	92.1%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	2	3.2%
Daylight	36	57.1%
Dusk	6	9.5%
Darkness	19	30.2%

Crash Movement		
Intersection, adjacent approaches	3	4.8%
Head-on (not overtaking)	3	4.8%
Opposing vehicles; turning	1	1.6%
U-turn	0	0.0%
Rear-end	4	6.3%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	1	1.6%
Overtaking; same direction	1	1.6%
Hit parked vehicle	1	1.6%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	8	12.7%
Off road, on straight	7	11.1%
Off road on straight, hit object	9	14.3%
Out of control on straight	1	1.6%
Off road, on curve	8	12.7%
Off road on curve, hit object	10	15.9%
Out of control on curve	2	3.2%
Other crash type	4	6.3%

CRASHES	63	
Fatal crash	1	1.6%
Injury crash	29	46.0%
Non-casualty crash	33	52.4%

CASUALTIES	38	
Killed	5	13.2%
Injured	33	86.8%
^ Unrestrained	1	2.6%

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

Time Group			% of Day
00:01 - 02:59	3	4.8%	12.5%
03:00 - 04:59	2	3.2%	8.3%
05:00 - 05:59	1	1.6%	4.2%
06:00 - 06:59	2	3.2%	4.2%
07:00 - 07:59	2	3.2%	4.2%
08:00 - 08:59	4	6.3%	4.2%
09:00 - 09:59	1	1.6%	4.2%
10:00 - 10:59	1	1.6%	4.2%
11:00 - 11:59	2	3.2%	4.2%
12:00 - 12:59	5	7.9%	4.2%
13:00 - 13:59	4	6.3%	4.2%
14:00 - 14:59	6	9.5%	4.2%
15:00 - 15:59	4	6.3%	4.2%
16:00 - 16:59	6	9.5%	4.2%
17:00 - 17:59	3	4.8%	4.2%
18:00 - 18:59	5	7.9%	4.2%
19:00 - 19:59	4	6.3%	4.2%
20:00 - 21:59	6	9.5%	8.3%
22:00 - 24:00	2	3.2%	8.3%

Crashes		Casualties
11	2010	7
17	2009	9
9	2008	4
10	2007	11
16	2006	7

~ School Travel Time		
Involvement	13	20.6%

Speed Limit					
40 km/h or less	1	1.6%	~ 40km/h or less	1	7.7%
50 km/h zone	7	11.1%	80 km/h zone	5	7.9%
60 km/h zone	1	1.6%	90 km/h zone	0	0.0%
70 km/h zone	0	0.0%	100 km/h zone	49	77.8%
			110 km/h zone	0	0.0%

Street Lighting Off/Nil			% of Dark
17	of	19 in Dark	89.5%

McLean Periods			% Week
A	8	12.7%	17.9%
B	3	4.8%	7.1%
C	14	22.2%	17.9%
D	3	4.8%	3.5%
E	2	3.2%	3.6%
F	9	14.3%	10.7%
G	9	14.3%	7.1%
H	7	11.1%	7.1%
I	4	6.3%	12.5%
J	4	6.3%	10.7%

Day of the Week						# Holiday Periods		
Monday	8	12.7%	Thursday	10	15.9%	Sunday	10	15.9%
Tuesday	10	15.9%	Friday	9	14.3%	WEEKDAY	45	71.4%
Wednesday	8	12.7%	Saturday	8	12.7%	WEEKEND	18	28.6%

New Year	0	0.0%	Queen's BD	1	1.6%	Easter SH	3	4.8%
Aust. Day	0	0.0%	Labour Day	1	1.6%	June/July SH	7	11.1%
Easter	0	0.0%	Christmas	0	0.0%	Sept./Oct. SH	1	1.6%
Anzac Day	0	0.0%	January SH	1	1.6%	December SH	0	0.0%

Crashid dataset Gunnedah - Boggabri Coal Project Crash Data 1/10/2005 to 30/9/2010

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

Brief Crash Report

Crash No	Date	Day	Time	Dist		ID Feature	Loc	Alg	Lgt	Wth	Sfc	SL	DCA	Tus	TU1	S1	D	Manoeuvre1	TU2	S2	D	Manoeuvre2	K	I	Fac
																									S F
Northern Region																									
Gunnedah LGA																									
Boggabri																									
Kamilaroi Hwy																									
508841	13/02/2006	Mon	00:01	15 km	S	BOGGABRI TN	2WY	STR	Nil	Overcast	Dry	100	609	1	CAR	1	N	Proceeding in lane					0	0	
Emerald Hill																									
Kamilaroi Hwy																									
603794	14/12/2007	Fri	15:00	15 km	S	BOGGABRI TN	2WY	CRV	Nil	Fine	Dry	100	803	L 1	4WD	1	E	Proceeding in lane					0	1	S
587887	16/08/2007	Thu	19:45		at	GOOLHI RD	TJN	CRV	Nil	Raining	Wet	100	804	L 1	CAR	1	S	Proceeding in lane					0	0	S
645705	12/11/2008	Wed	05:15	15 km	N	GUNNEDAH TN	2WY	CRV	Nil	Fine	Dry	100	801	L 1	BDBL	1	N	Proceeding in lane					0	0	S
Gunnedah																									
Blue Vale Rd																									
666016	05/05/2009	Tue	14:20	9.725 k	N	KAMILAROI HWY	2WY	CRV	Nil	Fine	Dry	100	201	2	LOR	1	N	Incorrect side	BDBL	1	S	Proceeding in lane	0	0	
554911	27/11/2006	Mon	13:00	640 m	S	VICKERY RD	2WY	CRV	Nil	Fine	Dry	100	804	L 1	SEM	1	S	Proceeding in lane					0	0	
532816	19/08/2006	Sat	02:10	2 km	N	WHITEHAVEN MIN RD	2WY	CRV	Nil	Fine	Dry	100	804	R 1	CAR	1	N	Proceeding in lane					0	0	
Bluevale Rd																									
649912	10/12/2008	Wed	17:05	8 km	N	GUNNEDAH TN	2WY	STR	Nil	Fine	Dry	100	506	2	BDBL	1	N	Pull out opposite	TRT	1	N	Turning right	0	0	
Farrar Rd																									
633001	15/07/2008	Tue	07:00		at	UNNAMED RD	TJN	STR	Nil	Fog or mi	Wet	80	202	2	UTE	1	W	Turning right	M/C	1	E	Proceeding in lane	0	1	
Kamilaroi Hwy																									
675454	16/07/2009	Thu	18:45	2 km	N	BLUE VALE RD	2WY	STR	Nil	Fine	Dry	100	703	1	CAR	1	E	Proceeding in lane					0	0	
720826	09/08/2010	Mon	18:25	50 m	S	BLUE VALE RD	2WY	STR	On	Fine	Dry	60	606	2	CAR	1	S	Proceeding in lane	LOR	1	N	Proceeding in lane	0	1	
618584	03/04/2008	Thu	06:30	5 km	N	GUNNEDAH TN	2WY	STR	Nil	Fine	Dry	100	609	1	CAR	1	S	Proceeding in lane					0	0	
693102	14/12/2009	Mon	14:40	10 km	N	GUNNEDAH TN	2WY	CRV	Nil	Fine	Dry	100	803	R 1	SEM	1	N	Proceeding in lane					0	0	
Old Blue Vale Rd																									
720103	24/07/2010	Sat	19:00	2 km	W	KELVIN RD	2WY	STR	Nil	Fine	Dry	100	609	1	TRK	1	W	Proceeding in lane					0	0	
Quia Rd																									
673102	14/05/2009	Thu	06:45	550 m	W	KAMILAROI HWY	2WY	STR	Nil	Fine	Dry	80	600	1	LOR	1	W	Proceeding in lane					0	1	
Wean Rd																									
710166	11/05/2010	Tue	18:00	1.55 km	N	KELVIN RD	2WY	CRV	Nil	Overcast	Dry	100	804	R 1	TRK	1	N	Proceeding in lane					0	2	S F
587966	27/08/2007	Mon	20:30	7 km	N	KELVIN RD	2WY	STR	Nil	Fine	Dry	100	609	1	CAR	1	S	Proceeding in lane					0	0	

Brief Crash Report

Crash No	Date	Day	Time	Dist		ID Feature	Loc	Alg	Lgt	Wth	Sfc	SL	DCA	Tus	TU1	S1	D	Manoeuvre1	TU2	S2	D	Manoeuvre2	K	I	Fac S	Fac F
596334	31/10/2007	Wed	20:00	2 km	N	KEPREOTIS RD	2WY	STR	Nil	Fine	Dry	100	609	1	TRK	1	N	Proceeding in lane					0	1		
Wean																										
Wean Rd																										
528498	08/07/2006	Sat	12:25	25 km	N	GUNNEDAH TN	2WY	STR	Nil	Fine	Dry	100	703	1	CAR	1	N	Proceeding in lane					0	0		
630782	10/07/2008	Thu	08:00	26 km	N	GUNNEDAH TN	2WY	STR	Nil	Fine	Dry	100	705	1	CAR	1	S	Proceeding in lane					0	1		
Western Region																										
Narrabri LGA																										
Baan Baa																										
Kamilaroi Hwy																										
579295	15/06/2007	Fri	19:00	2 km	E	BAAN BAA TN	2WY	STR	Nil	Fine	Dry	100	609	1	CAR	1	W	Proceeding in lane					0	0		
691317	28/06/2009	Sun	16:10	2 km	E	BAAN BAA TN	2WY	STR	Nil	Overcast	Dry	100	702	1	CAR	1	E	Proceeding in lane					0	1		F
667082	04/05/2009	Mon	12:25	3 km	E	BAAN BAA TN	2WY	STR	Nil	Fine	Dry	100	704	1	SEM	1	E	Proceeding in lane					0	1		
554221	02/02/2007	Fri	10:40	5 km	N	BAAN BAA TN	2WY	STR	Nil	Fine	Dry	100	701	1	TRK	1	N	Proceeding in lane					0	1		
628344	01/06/2008	Sun	20:20	5 km	N	BAAN BAA TN	2WY	STR	Nil	Fine	Dry	100	703	1	TRK	1	N	Proceeding in lane					0	1		F
597737	16/12/2007	Sun	16:00	6 km	S	BANN BAA TN	2WY	STR	Nil	Fine	Dry	100	201	2	CAR	1	S	Incorrect side	SEM	1	N	Proceeding in lane	5	1		
533581	25/08/2006	Fri	23:55	100 m	N	BARANBAH ST	2WY	STR	Nil	Fine	Dry	80	701	1	CAR	1	S	Proceeding in lane					0	0		
690428	12/11/2009	Thu	08:45	500 m	S	BARANBAH ST	2WY	CRV	Nil	Fine	Dry	100	301	2	SEM	1	S	Proceeding in lane	UTE	1	S	Proceeding in lane	0	0		
720145	27/07/2010	Tue	14:30	100 m	E	HARPARARY RD	2WY	STR	Nil	Fine	Dry	100	704	1	TRK	1	W	Proceeding in lane					0	0		F
619355	27/03/2008	Thu	12:20	29 km	S	NARRABRI TN	2WY	STR	Nil	Fine	Dry	100	610	2	4WD	1	N	Proceeding in lane	OMV	1	S	Proceeding in lane	0	0		
576539	04/06/2007	Mon	21:45	30 km	S	NARRABRI TN	2WY	STR	Nil	Fine	Dry	100	609	1	4WD	1	S	Proceeding in lane					0	0		
526812	10/06/2006	Sat	13:00	45 km	S	NARRABRI TN	2WY	CRV	Nil	Raining	Wet	100	805	2	M/C	1	N	Proceeding in lane	M/C	1	N	Proceeding in lane	0	3	S	
668108	12/05/2009	Tue	08:30	700 m	S	OLD NARRABRI RD	2WY	CRV	Nil	Fine	Dry	100	801	L 1	SEM	1	N	Proceeding in lane					0	1	S	F
661495	24/03/2009	Tue	14:45	100 m	N	WALOWA ST	2WY	STR	Off	Fine	Dry	40	301	2	TRK	1	S	Proceeding in lane	SEM	1	S	Stationary	0	0		
Old Narrabri Rd																										
548559	21/11/2006	Tue	08:10	5 km	N	KAMILAROI HWY	2WY	STR	Nil	Fine	Dry	100	301	2	UTE	1	S	Proceeding in lane	LOR	1	S	Proceeding in lane	0	1		
Boggabri																										
Boggabri Rd																										
518820	29/04/2006	Sat	15:30	2 km	W	WEAN RACECOURS O	2WY	STR	Nil	Fine	Dry	100	702	1	CAR	1	W	Proceeding in lane					0	0		
Boston St																										
538552	01/10/2006	Sun	17:10	3 km	W	WALTON ST	2WY	STR	Nil	Fine	Dry	100	702	1	CAR	1	W	Proceeding in lane					0	1		
Braymont Rd																										

Brief Crash Report

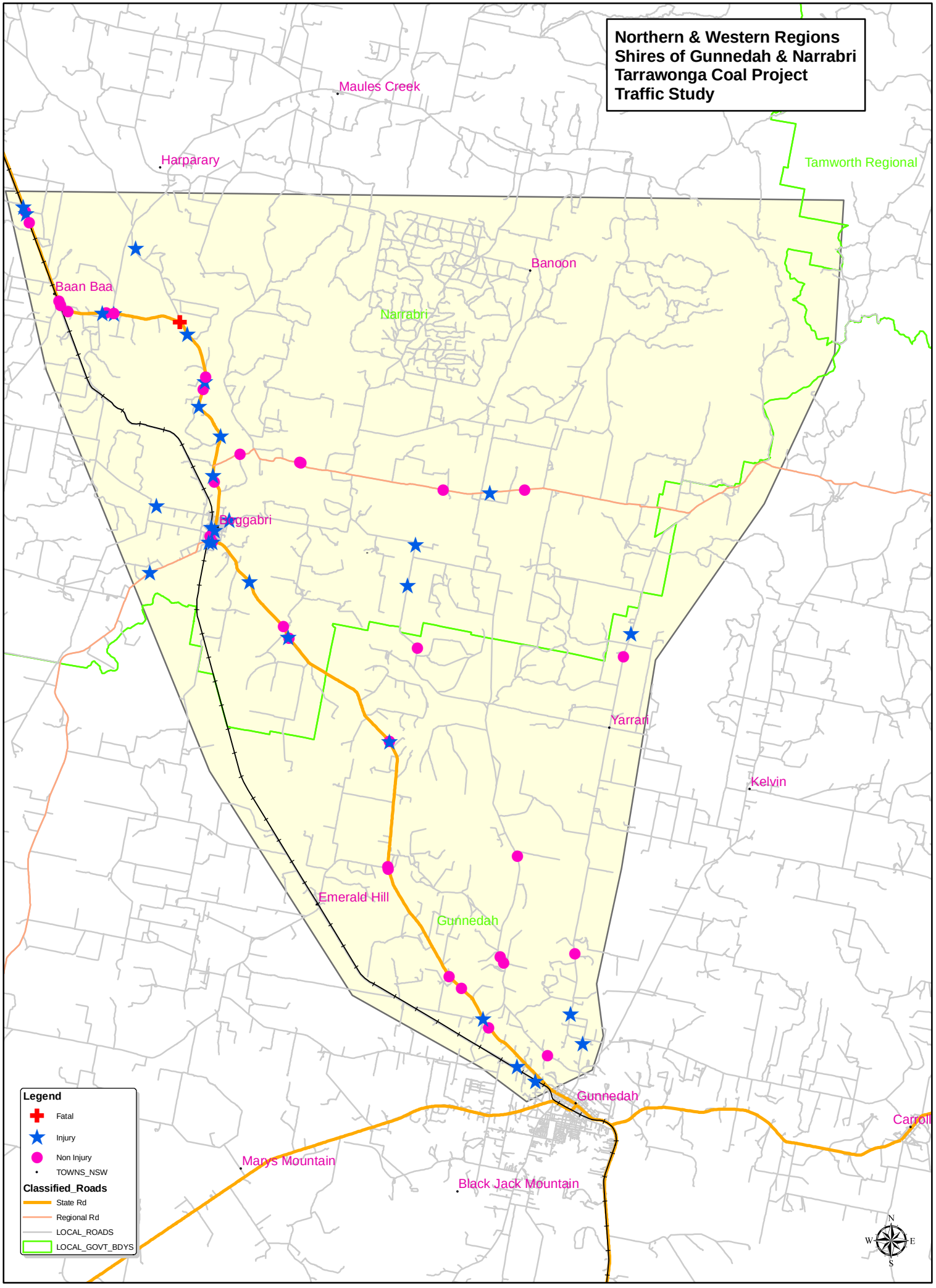
Crash No	Date	Day	Time	Dist		ID Feature	Loc	Alg	Lgt	Wth	Sfc	SL	DCA	Tus	TU1	S1	D	Manoeuvre1	TU2	S2	D	Manoeuvre2	K	I	Fac	
																									S	F
719525	21/07/2010	Wed	17:15	5 km	N	BLUE VALE RD	2WY	STR	Nil	Fine	Dry	100	703	1	TRK	1	S	Proceeding in lane					0	1		
678846	14/08/2009	Fri	15:20	11.935 k	E	BOGGABRI TN	2WY	CRV	Nil	Fine	Dry	100	801	L 1	LOR	1	E	Proceeding in lane					0	1	S	
696487	10/01/2010	Sun	12:30	80 m	E	HULL ST	2WY	CRV	Nil	Fine	Dry	100	803	R 1	TRK	1	W	Proceeding in lane					0	1	S	
	Grantham St																									
711044	19/05/2010	Wed	21:37		at	OAKHAM ST	TJN	STR	On	Fine	Dry	50	707	L 1	SEM	1	E	Turning right					0	1	S	
	Kamilaroi Hwy																									
693355	15/12/2009	Tue	18:30	6.5 km	S	BOGGABRI TN	2WY	CRV	Nil	Fine	Dry	100	801	L 1	TRK	1	N	Proceeding in lane					0	1	S	F
674378	29/06/2009	Mon	22:30	2 km	N	BOSTON ST	DIV	CRV	Nil	Fine	Dry	100	609	1	WAG	1	N	Proceeding in lane					0	0		
682732	11/09/2009	Fri	19:56		at	BRENT ST	XJN	STR	On	Fine	Dry	50	101	2	4WD	2	W	Proceeding in lane	BDBL	1	S	Proceeding in lane	0	1		
535852	10/09/2006	Sun	09:30		at	DEADMANS GULLY BD(	2WY	CRV	Nil	Overcast	Wet	100	803	R 1	CAR	1	S	Proceeding in lane					0	1	S	
534487	03/09/2006	Sun	16:00	3 km	N	GINS LEAP OT	2WY	STR	Nil	Fine	Dry	100	704	1	4WD	1	N	Proceeding in lane					0	0		
520353	14/05/2006	Sun	04:35	35 km	N	GUNNEDAH TN	2WY	CRV	Nil	Fine	Dry	100	802	L 1	4WD	1	W	Proceeding in lane					0	0	S	
575480	26/05/2007	Sat	04:00	1.7 km	N	MANILLA RD	2WY	CRV	Nil	Fine	Dry	100	801	L 1	ATKR	1	S	Proceeding in lane					0	1	S	F
591863	20/07/2007	Fri	15:30	3.7 km	N	MANILLA RD	2WY	CRV	Nil	Fine	Dry	100	201	2	M/C	1	S	Incorrect side	BDBL	1	N	Proceeding in lane	0	1		
671177	16/06/2009	Tue	16:55	350 m	N	MINE ROAD OP	2WY	CRV	Nil	Fine	Dry	100	803	L 1	4WD	1	N	Proceeding in lane					0	0		
718721	20/07/2010	Tue	14:20	500 m	S	RANGARI RD	2WY	STR	Nil	Fine	Dry	100	701	1	TRK	1	S	Proceeding in lane					0	1		
633282	31/07/2008	Thu	16:30	Unk		UNKNOWN UK	2WY	CRV	Nil	Fine	Dry	100	301	2	CAR	1	W	Proceeding in lane	TRK	1	W	Proceeding in lane	0	0		
532979	23/08/2006	Wed	12:48		at	WEE WAA ST	XJN	STR	Nil	Fine	Dry	50	101	2	TRK	2	N	Proceeding in lane	4WD	1	E	Proceeding in lane	0	0		
691215	09/12/2009	Wed	14:45		at	WEE WAA ST	XJN	STR	Nil	Fine	Dry	50	104	2	CAR	1	W	Turning right	TRK	2	S	Proceeding in lane	0	1		
	Manilla Rd																									
710481	19/05/2010	Wed	16:45	5.44 km	E	KAMILAROI HWY	2WY	CRV	Nil	Fine	Dry	80	805	1	LOR	1	W	Proceeding in lane					0	0	S	
686531	25/09/2009	Fri	13:10	16 km	E	KAMILAROY HWY	DIV	STR	Nil	Fine	Dry	80	802	L 1	BDBL	1	S	Forward from drive					0	1	S	
699410	18/02/2010	Thu	18:50	110 m	W	THE IRON BDGE	2WY	STR	Nil	Fine	Dry	100	406	2	M/C	1	N	Forward from drive	TRK	1	W	Proceeding in lane	0	0		
	Mullaley Rd																									
518139	20/04/2006	Thu	13:20	2 km	E	BLAIRMORE RD	2WY	CRV	Nil	Fine	Dry	100	801	L 1	BDBL	1	E	Proceeding in lane					0	1	S	F
	Oakham St																									
717875	16/07/2010	Fri	11:30	30 m	N	CLARE ST	2WY	STR	Nil	Fine	Dry	50	703	1	CAR	1	S	Proceeding in lane					0	0		
623422	13/04/2008	Sun	00:47		at	NUMBER 95 HN	2WY	STR	Nil	Fine	Dry	50	601	2	TRK	1	S	Proceeding in lane	TRK	1	S	Parked	0	1	S	
	Unnamed Lane																									
688409	07/11/2009	Sat	21:15	20 m	N	GRANTHAM ST	2WY	STR	Nil	Overcast	Wet	50	703	1	CAR	1	S	Proceeding in lane					0	0		F
	Wean																									

Brief Crash Report

Crash No	Date	Day	Time	Dist		ID Feature	Loc	Alg	Lgt	Wth	Sfc	SL	DCA	Tus	TU1	S1	D	Manoeuvre1	TU2	S2	D	Manoeuvre2	K	I	Fac S	Fac F
Manilla Rd																										
528532	09/07/2006	Sun	07:30	5 km	E	BLUEVALE RD	2WY	STR	Nil	Unk	Dry	100	701	1	CAR	1	E	Proceeding in lane					0	0		F
Wean St																										
528464	08/07/2006	Sat	11:00	5.39 km	E	BOGGABRI TN	2WY	CRV	Nil	Fine	Dry	100	803	R 1	4WD	1	E	Proceeding in lane					0	0	S	

Report Totals: Crashes: 63 Fatal Crashes: 1 Injury Crashes: 29 Non-Casualty Crashes: 33 Traffic Units: 80 Killed: 5 Injured: 33

Crashid dataset Gunnedah - Boggabri Coal Project Crash Data 1/10/2005 to 30/9/2010

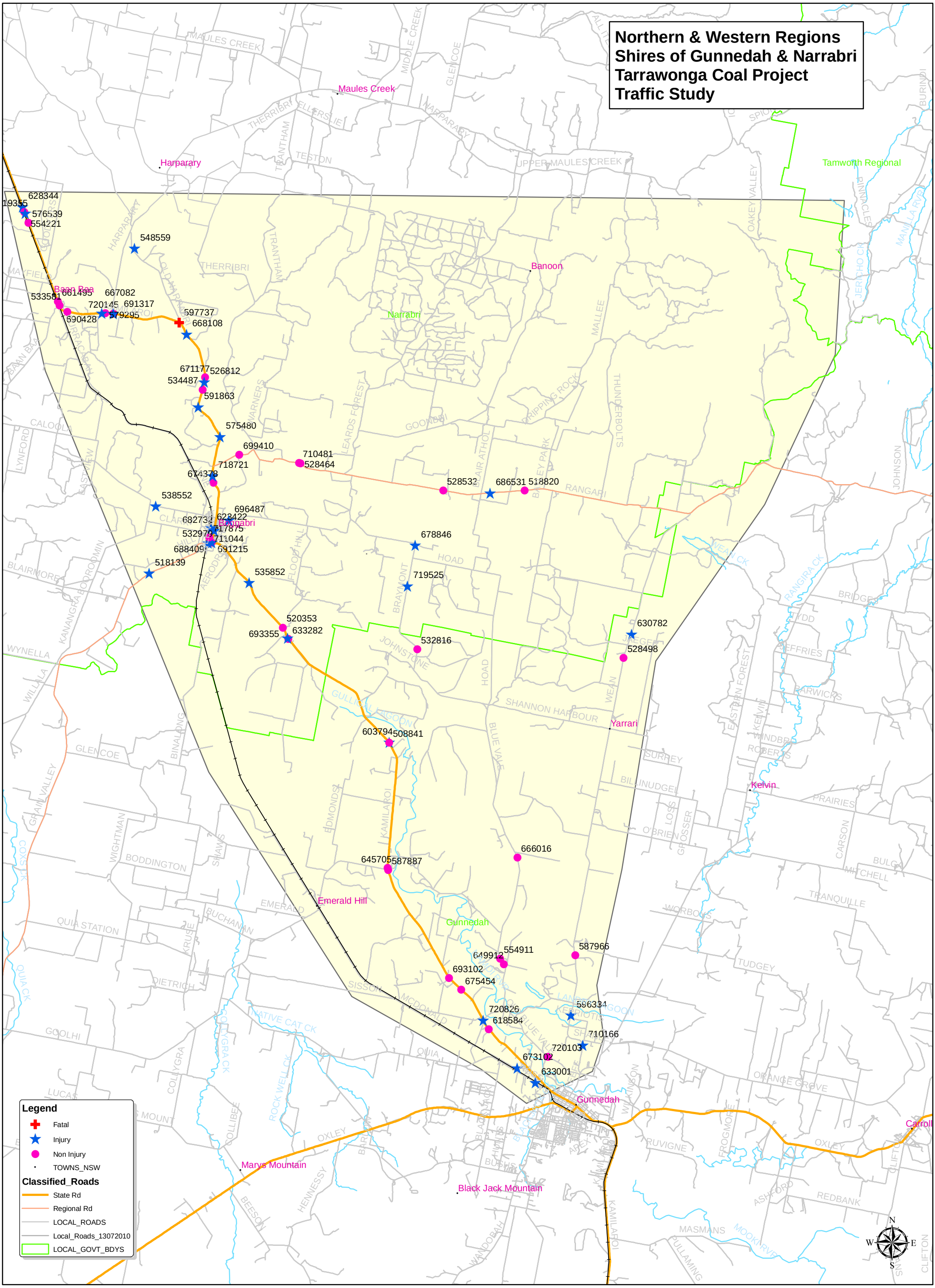


Prepared By: Jim Synott Date : 16/5/2011

Crash Data Period
1/10/2005 to 30/9/2010

0 1.5 3 6 9 12 Kilometers

Northern & Western Regions
Shires of Gunnedah & Narrabri
Tarrawonga Coal Project
Traffic Study



Prepared By: Jim Synott Date : 16/5/2011

Crash Data Period
1/10/2005 to 30/9/2010

0 1.5 3 6 9 12 Kilometers