Tasman Extension Project
Environmental Impact Statement

APPENDIX H

ROAD TRANSPORT ASSESSMENT

Resource Strategies

DONALDSON COAL
Part of Gloucester Coal

Tasman Extension Project

Road Transport Assessment

30 March 2012

Prepared for

Donaldson Coal Pty Ltd

Halcrow

Tasman Extension Project
Road Transport Assessment

Prepared for

Donaldson Coal Pty Ltd

This report has been issued and amended as follows:

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References

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1 Introduction

This report has been prepared on behalf of Donaldson Coal Pty Ltd (Donaldson Coal) and presents the results of an assessment of the road transport implications of a proposal to extend underground mining operations at the Tasman Underground Mine (Tasman) for an additional operational life of 15 years beyond its current anticipated cessation of mining operations at approximately the end of 2014[1]. The annual run-of-mine (ROM) coal production from Tasman would increase from 975,000 tonnes per annum (tpa) to 1.5 million tonnes per annum (Mtpa), and proposed changes to access arrangements would reduce the distance travelled by coal haulage vehicles on public roads by 6km (return trip). The proposed development is known as the Tasman Extension Project (the Project).

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

> ***Traffic & Transport*** *- including:*
>
> - *a detailed economic justification of transporting coal on public roads, including assessment of the costs and benefits of alternative transport methods;*
> - *an assessment of potential traffic impacts on the capacity, efficiency and safety of the road network; and*
> - *a description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road network in the surrounding area over the life of the project.*

The economic aspects of the above are addressed separately in Gillespie Economics (2012) (Appendix M to the Main Report of the Environmental Impact Statement).

The assessment has been prepared in accordance with the New South Wales (NSW) Roads and Traffic Authority's (RTA) (2002) *Guide to Traffic Generating Developments*, and where relevant, makes reference to the RTA's (1996) *Road Design Guide*.

[1] Note that use of the existing pit top may continue in 2015 following completion of mining, including haulage of stockpiled coal.

An appreciation of the existing traffic situation around Tasman 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 mine, observed growth in background traffic, safety aspects of the road system, and expected changes to 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 Tasman.
- Section 3 describes the existing road transport conditions on the road system around the mine.
- Section 4 assesses the potential impacts of the Project.
- Section 5 presents the conclusions of the investigation.

2 Existing and Proposed Coal Mine Operations

2.1 Existing Operations at the Tasman Underground Mine

Tasman is an underground coal mining operation owned and operated by Donaldson Coal. It is located approximately 20 kilometres (km) west of the port of Newcastle, NSW, in the Newcastle Coalfield. Donaldson Coal also operates the nearby Donaldson Open Cut Mine and Abel Underground Mine within the Newcastle Coalfield. The location of Tasman in its regional context is shown on **Figure 1** of this report. Vehicular site access to the mine pit top is from George Booth Drive as shown in **Figure 1**.

The existing Tasman pit top off George Booth Drive comprises ROM coal handling infrastructure, administration facilities, worker amenities and stores buildings, workshop compound and associated mine infrastructure.

Tasman operates 24 hours per day, seven days per week. Mining is currently occurring within the Fassifern Seam in accordance with the existing Development Consent (DA 274-9-2002).

2.1.1 Coal Haulage

ROM coal produced at Tasman is transported by public and private roads to the Bloomfield Coal Handling and Preparation Plant (Bloomfield CHPP) where the coal is processed before being transported by rail to Newcastle (**Figure 2**). The movement of coal by road is restricted to between 7.00am and 10.00pm Monday to Friday. No coal is transported on weekends or public holidays.

The coal is transported by truck along the private Tasman access road, then northwards along George Booth Drive, eastwards on John Renshaw Drive and then north on the private Donaldson access road to the Bloomfield CHPP. Empty trucks return along the same route. A Road Transport Protocol (Donaldson Coal, 2009) sets out details of the coal haulage between Tasman and the Bloomfield CHPP. The Protocol defines the haul route, the maximum number of movements and the haulage hours, and includes a Code of Conduct for drivers.

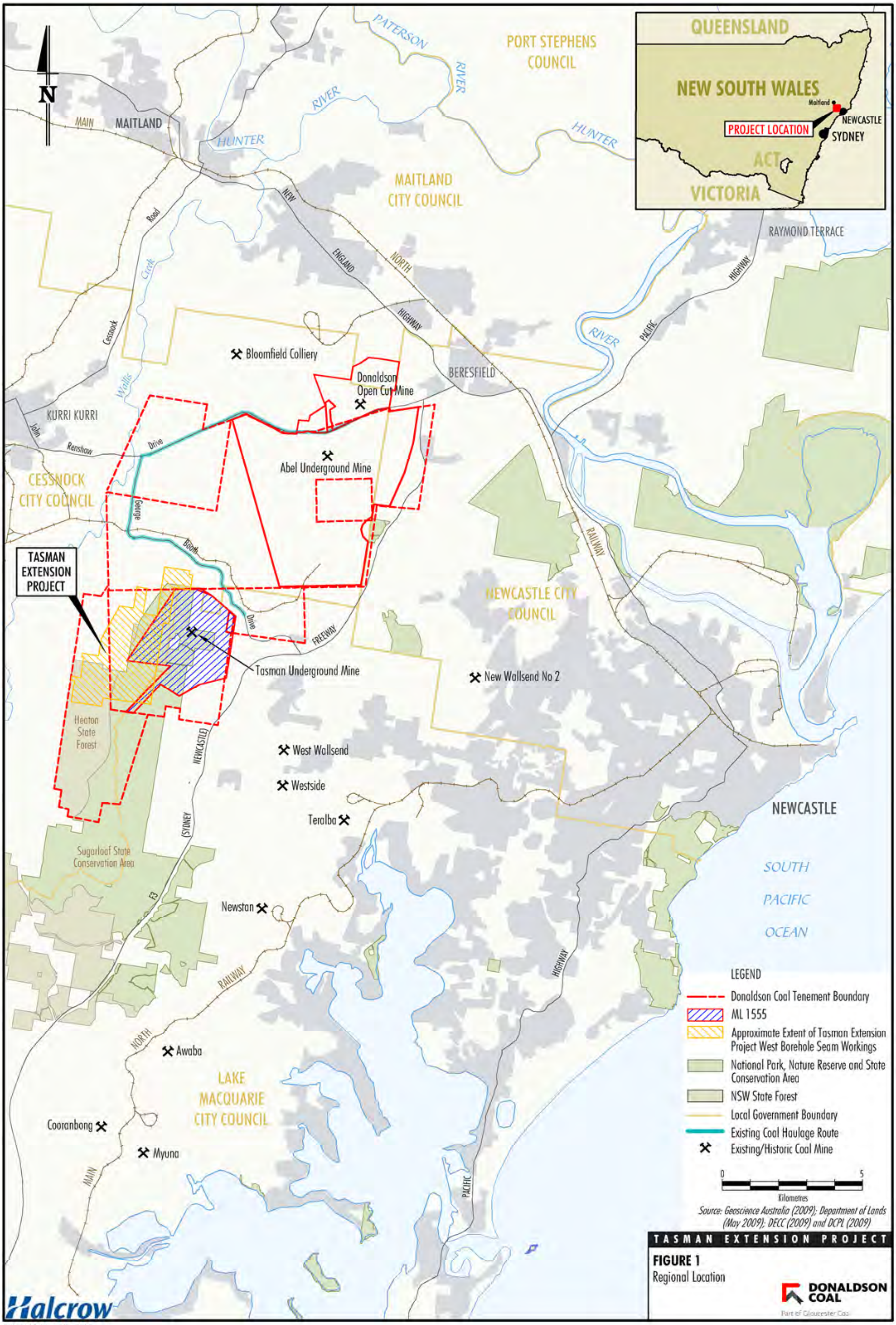

FIGURE 1
Regional Location

DCL-09-01 EIS_AppRT_103C

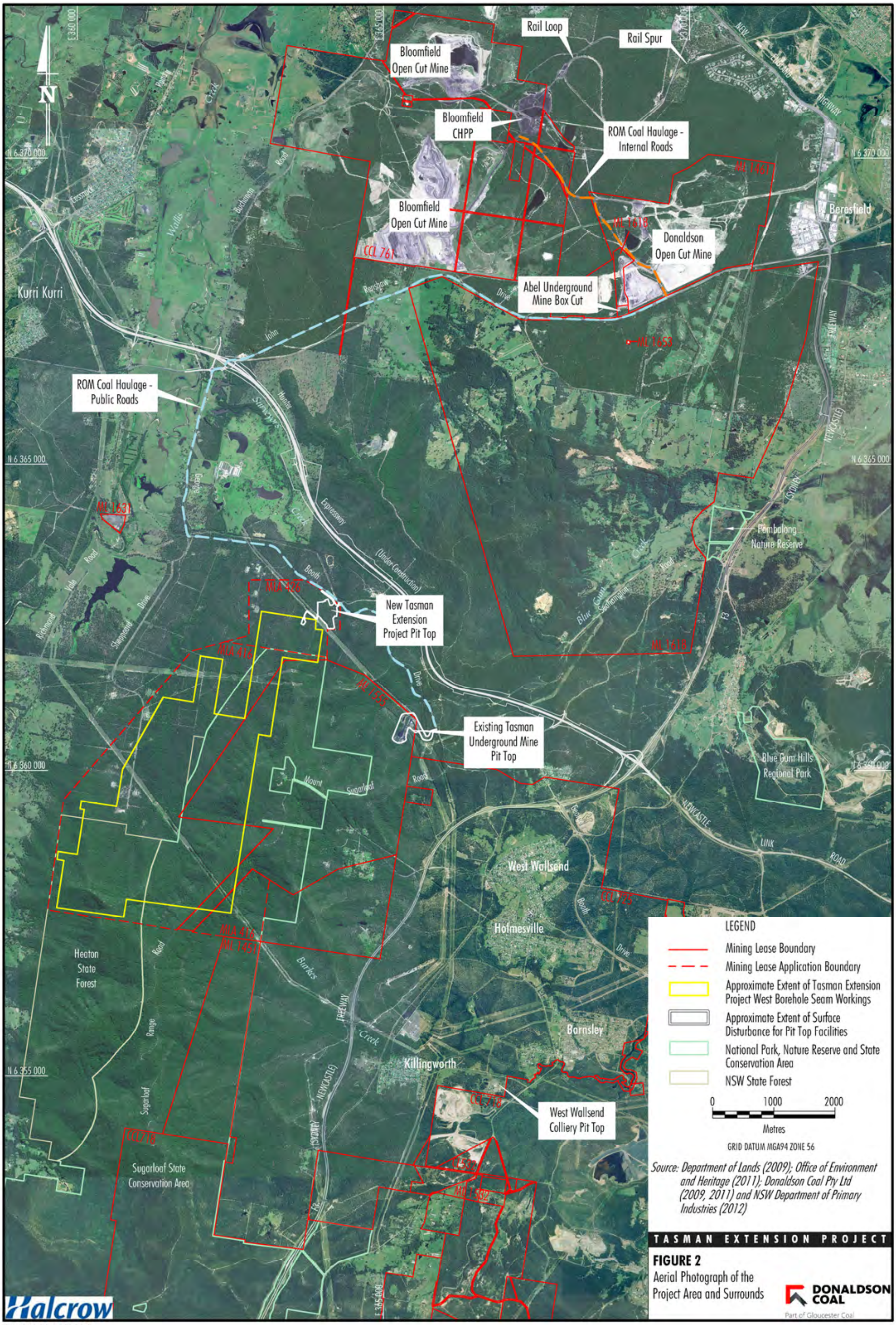

FIGURE 2
Aerial Photograph of the Project Area and Surrounds

DCL-09-01 EIS_AppRT_104D

The existing Road Transport Protocol restricts the number of loaded trucks leaving Tasman to a maximum of 12 loaded trucks per hour, and maximum 118 per day. Thus, a maximum of 236 truck trips are allowed each day to move coal from Tasman to the Bloomfield CHPP. A trip is a one way movement, so a loaded truck leaving Tasman and travelling to the Bloomfield CHPP generates one trip, and the returning empty truck also generates one trip.

2.1.2 *Employees*

Tasman employs 110 full time personnel, who work on a rostered shift basis on weekdays, as follows:

- Daytime shift 6.30am to 4.30pm: 33 employees.
- Afternoon shift 2.30pm to 10.30pm: 27 employees.
- Night shift 9.30pm to 7.30am: 25 employees.
- Rostered off: 25 employees.

On weekends, the shifts are as follows:

- Night shift 9.30pm Friday to 7.30am Saturday: 25 employees.
- Saturday daytime shift 6.30am to 4.30pm: 33 employees.
- Saturday afternoon shift 2.30pm to 10.30pm: 4 or 5 employees.
- Night shift 9.30pm Saturday to 7.30am Sunday: 4 or 5 employees.
- Sunday daytime shift 6.30 am to 4.30 pm: 4 or 5 employees.
- Sunday afternoon shift 2.30pm to 10.30pm: 4 or 5 employees.
- Night shift 9.30pm Sunday to 7.30 am Monday: 25 employees.

Donaldson Coal has advised that employees typically travel by car, with an average of 1.1 people per car. Thus, 85 employees would travel to and from the mine on a typical weekday, generating 154 vehicle trips per day. On Saturdays and Sunday, employees would generate 94-96 and 41-45 vehicle trips per day respectively.

Donaldson Coal has provided information regarding the residential locations from which employees travel to Tasman. Based on these locations, the following distribution of employees' trips on the surrounding road system has been determined:

- 76 percent (%) George Booth Drive south of Tasman;
- 10% George Booth Drive North and John Renshaw Drive West;
- 9% George Booth Drive North and Buchanan Road North; and
- 5% George Booth Drive North and John Renshaw Drive East.

2.1.3 *Deliveries and Visitors*

In addition to employees and coal haulage trucks, delivery and visitor vehicles arrive each weekday, including:

- Suppliers' visits;
- Couriers delivering small parts;
- Semitrailers delivering stone dust (typically weekly);
- B-doubles delivering roof bolts and mesh modules (generally weekly);
- Semitrailers delivering conveyor equipment (typically four times a year); and
- Other small trucks delivering vent tubes or removing vent tubes for repair.

The distribution of delivery and visitors vehicles has been estimated as below, and it is estimated that approximately 20% of delivery and visitor trips are made by heavy vehicles:

- 70% George Booth Drive south of Tasman;
- 10% George Booth Drive North and Buchanan Road North;
- 10% George Booth Drive North and John Renshaw Drive East; and
- 10% George Booth Drive North and John Renshaw Drive West.

On an average weekday, it is estimated that around 60 delivery and visitor vehicles arrive and depart to and from the site, generating around 120 vehicle trips per day.

2.1.4 *Total Tasman Underground Mine Daily Traffic Generation*

Table 2.1 summarises the existing average weekday daily traffic generation of Tasman, based on the typical volumes of traffic generated by the various mine activities as discussed above.

Table 2.1 – Estimated Existing Typical Weekday Daily Traffic (vehicles/day)

Road and Location	Heavy Vehicles		Light Vehicles		Total
	Coal	Deliveries	Employees	Deliveries	
Tasman Mine Access					
Existing off George Booth Dr	150	24	154	96	424
George Booth Drive					
South of Existing Mine Access	0	17	116	67	200
North of Project Mine Access	150	8	38	28	224
John Renshaw Drive					
East of Donaldson Access	0	3	8	9	20
West of Donaldson Access	150	3	8	9	170

Tasman is therefore expected to generate around 424 vehicle trips per day on an average weekday, based on average daily coal haulage. When coal haulage is at its maximum of 236 vehicle trips per day, the total generation of Tasman would be expected to increase to about 510 vehicle trips per day, assuming that the number of visitors and deliveries remains typical on such days.

On weekends, the only traffic generated by the mine is employee traffic, as there are generally no deliveries or visitors and there are no coal haulage trucks. Table 2.2 summarises the existing daily traffic generation of the Tasman Underground Mine on Saturdays, being the busier of the two weekend days, based on the typical traffic generation discussed above, and the maximum number of employees expected to be on the site.

Table 2.2 – Estimated Existing Typical Saturday Daily Traffic (veh/day)

Road and Location	Heavy Vehicles		Light Vehicles		Total
	Coal	Deliveries	Employees	Deliveries	
Tasman Mine Access					
Existing off George Booth Dr	0	0	96	0	96
George Booth Drive					
South of Existing Mine Access	0	0	73	0	73
North of Project Mine Access	0	0	23	0	23
John Renshaw Drive					
East of Donaldson Access	0	0	5	0	5
West of Donaldson Access	0	0	5	0	5

On a Saturday, the Tasman Underground Mine is therefore expected to generate around 96 vehicle trips per day.

2.2 The Proposed Project

2.2.1 *Description of the Project*

The main activities associated with the development of the Project would include:

- continued underground mining of the Fassifern Seam using a combination of total and partial pillar extraction methods within Mining Lease (ML) 1555;
- underground mining of the West Borehole Seam using a combination of total and partial pillar extraction methods;
- production of ROM coal up to 1.5Mtpa;
- development of a new pit top facility, associated ROM coal handling infrastructure and intersection with George Booth Drive;
- development of ventilation surface infrastructure;
- continued transport of Fassifern Seam ROM coal from the existing Tasman pit top to the Bloomfield CHPP via truck on public and private roads to approximately 2015 (inclusive);
- transport of West Borehole Seam ROM coal from the new pit top to the Bloomfield CHPP via truck on public and private roads;
- progressive development of sumps, pumps, pipelines, water storages and other water management equipment and structures;
- ongoing exploration activities;
- ongoing surface monitoring, rehabilitation and remediation of subsidence effects; and
- other associated minor infrastructure, plant, equipment and activities.

Further description is provided in Section 2 (Project Description) of the Main Report of the Environmental Impact Statement.

2.2.2 *Road Transport Aspects of the Project*

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

Life of Mine

The mining life of Tasman would be extended to allow for an additional 15 years of mining to Year 2029.

Access Road

- A new private road would be provided for the new pit top, with construction of a new intersection on George Booth Drive approximately 3km north-west of the existing access road.
- The new access road intersection with George Booth Drive would be constructed as a single lane roundabout, forming the fourth leg of the existing intersection of George Booth Drive with the Daracon Quarry access road.

Coal Haulage

- Increase in coal road transport movements from Tasman to the Bloomfield CHPP as a direct result of the increased ROM coal production from 975,000tpa to 1.5Mtpa.
- Transport of ROM coal would continue from the existing pit top during 2013, and coal transport would commence from the new pit top in 2014. Both pit tops would be used simultaneously in 2014 and the start of 2015, after which the existing pit top would be decommissioned.
- Existing maximum transport of up to 4,000 tonnes (t) of ROM coal per day prior to commissioning of the Hunter Expressway, expected in late 2013.
- Increase in the maximum transport rate to up to 6,200t of ROM coal per day following commissioning of the Hunter Expressway, expected in late 2013.
- Movement of coal by road to be restricted to 7.00am to 10.00pm Monday to Friday, and 7.00am to 6.00pm on Saturdays. No coal transport by road on Sunday or public holidays.
- Saturday coal haulage would be limited to a maximum of 50 truck departures per day, for a maximum of 26 Saturdays per year.

Waste Rock Haulage

- In 2013 the Project construction activities at the new pit top would produce waste rock from the excavation of the box cut, general site earthworks and development of the underground drift.

- This material would be used on-site as construction fill or temporarily stockpiled on-site for subsequent off-site transportation.
- Over a period of approximately one year a proportion of the waste rock material produced by the excavations would be trucked off-site for disposal at the Donaldson Open Cut, using the same haulage contractor, trucks and haulage route as for the transport of ROM coal.

Workforce

- Increase in light vehicle traffic generation as a direct result of the increase in employees from 110 to approximately 150 full time on-site personnel.
- Increase in light vehicle traffic generation associated with a construction workforce, which would comprise up to 20 personnel per day in 2013.

Deliveries and Visitors

- Increase in visitors and delivery of consumables directly resulting from increased ROM coal production and on-site activity.

2.3 Future Road Transport Assessment Scenarios

The Project would extend the life of Tasman by 15 years to 2029. Construction of the new pit top would occur in 2013, which would be the peak period for construction traffic generation, including the movement of waste rock from the Project to the Donaldson Open Cut using the haul route. The Project would commence prior to the opening of the Hunter Expressway in late 2013, which is expected to have a significant impact on traffic conditions on the public road components of the coal haulage route, in particular on George Booth Drive (i.e. a significant decrease of over 90% in two-way traffic). The assessment which follows considers the following scenarios, which represent key stages in the Project:

- Construction of New Pit Top (2013). This scenario involves existing coal haulage from the existing pit top at Tasman to Bloomfield CHPP and return of empty vehicles, existing operational workforce and delivery movements to and from the existing pit top, construction waste rock movement from the new pit top to the Donaldson Open Cut and return of empty vehicles, and general construction vehicle movements to and from the new pit top area. This scenario conservatively assumes that this activity would occur prior to the opening of the Hunter Expressway. It represents the year during which peak construction activity would occur simultaneously with existing Tasman operational traffic.

- Peak Traffic Generation (2017). Under this scenario, all future operational traffic associated with Tasman would use the new pit top access and the existing pit top would be decommissioned simultaneously. This scenario represents peak traffic generation and coal transport solely from the new pit top access road, and assumes that the Hunter Expressway is open. For the purpose of assessment it has been assumed that decommissioning would occur in 2017 (i.e., in approximately 5 years' time), although it may occur somewhat earlier or later than this in practice.
- Maximum Background Traffic Growth (2029). This scenario assumes all operational traffic associated with Tasman would use the new pit top access road, and maximum background growth in background traffic over the life of the Project. In practice it is anticipated that the traffic generation in the final Project year would be lower than in previous years, as coal production and deliveries would be tapering off. However, to be conservative, this scenario includes continued transport of coal at the maximum rate, and continued deliveries at the same rate as during peak production. The scenario assumes these occur at the same time as maximum background growth in traffic unrelated to Tasman.

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 Roads and Maritime Services (RMS) (formerly the RTA). The RMS 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 RMS has adopted a classification system relating to funding purposes. It defines roads as:

- State Roads – performing an important state function for which the RMS funds 100% of the maintenance cost. State roads are essentially arterial roads.

- Regional Roads – roads performing a significant regional function and for which the RMS and Council contribute 50% each towards maintenance. Regional roads are essentially sub-arterial 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 Tasman Underground Mine is shown in **Figure 1** of this report, and is described below.

George Booth Drive (Main Road 527) is a State Road which provides a link between Edgeworth and Buchanan. It has an interchange with the F3 Freeway where northbound freeway traffic may exit to a roundabout on George Booth Drive, and George Booth Drive traffic may enter the freeway southbound. To the north and west of the freeway, George Booth Drive typically has a single travel lane in each direction, with some overtaking lanes in both directions.

To the west of the F3 Freeway, George Booth Drive typically has centre linemarking and a posted speed limit of 80 kilometres per hour (km/h). The speed limit reduces to 60km/h for about 400m on the approach to the intersection with John Renshaw Drive. There are some lower advisory speeds on some bends, notably an advisory speed of 45km/h on George Booth Drive on its approaches to the intersection with Richmond Vale Road.

George Booth Drive has some sections of steep grades to the west of the Tasman access road. Travelling northwards from Tasman towards John Renshaw Drive, George Booth Drive slopes downwards towards its crossing of Blue Gum Creek, then climbs steeply, where an overtaking lane is provided. This is the steepest section of George Booth Drive between Tasman and John Renshaw Drive.

George Booth Drive provides access to a number of private properties, with the majority of these accesses being located in the section between Richmond Vale Road and John Renshaw Drive.

The intersection formed between the Tasman access road and George Booth Drive is a seagull intersection, with dedicated deceleration lanes for vehicles turning into the mine, and dedicated acceleration lanes for vehicles turning out of the mine.

The existing Daracon Quarry has an access off George Booth Drive located at the proposed intersection of the new Tasman pit top access road with George Booth Drive. This intersection is currently a tee intersection with an "AUR" type right turn treatment, which provides a second lane for through vehicles on George Booth Drive to pass around a vehicle slowing to turn right into the Daracon Quarry access road. An "AUL" type left turn treatment is provided for the left turn from George Booth Drive into the Daracon Quarry access road, which provides a deceleration lane for left turn vehicles, allowing through traffic to pass a slowing vehicle. Separate left and right turn lanes are provided in the Daracon Quarry access road, and vehicles turning left into George Booth Drive are provided with an acceleration lane prior to a merge into the through lane of George Booth Drive, which allows the turning vehicles to increase speed to that of the through vehicles on George Booth Drive, minimising their impact on through traffic conditions.

The intersection formed between George Booth Drive and John Renshaw Drive is a roundabout, with single approach and departure lanes on George Booth Drive and John Renshaw Drive west, and two approach and departure lanes on John Renshaw Drive east.

John Renshaw Drive (Main Road 588) is a State Road which provides a link between the F3 Freeway-Weakleys Drive intersection at Beresfield and Kurri Kurri. Between Beresfield and George Booth Drive, John Renshaw Drive typically has a single travel lane in each direction, with centre linemarking and a posted speed limit of 100 km/h.

John Renshaw Drive has several long straight sections, with gentle grades and large radius bends. The intersection formed between the Donaldson access road and John Renshaw Drive is a seagull intersection, with dedicated deceleration lanes for vehicles turning into the mine, and dedicated acceleration lanes for vehicles turning out of the mine. Vehicles turning right out of the access road are not required to merge with the through traffic, rather turning into a dedicated lane. These two lanes merge to a single lane over 1km to the west of the intersection.

Construction work is presently underway to construct the Hunter Expressway Buchanan interchange with John Renshaw Drive, to the east of the George Booth Drive intersection. John Renshaw Drive has been partially diverted, and its planned final layout is described in Section 3.4.

Road Works were undertaken at a number of locations on the public roads as a component of the development of Tasman, in accordance with its consent conditions, including:

- Construction of the seagull type intersection at the George Booth Drive/Tasman access road intersection;
- Construction of an auxiliary climbing lane on the westbound carriageway on George Booth Drive from Blue Gum Creek to the west for a distance of 1200 metres (m);
- Construction of an auxiliary climbing lane on the eastbound carriageway of George Booth Drive over a distance of between 1200m to 2800m from the proposed mine access;
- Construction of an auxiliary climbing lane on the eastbound carriageway of John Renshaw Drive to the east of George Booth Drive for a distance of 1200m;
- Construction of sealed passing lanes on George Booth Drive at each property access between Richmond Vale Road and John Renshaw Drive; and
- Widening of the road shoulders on George Booth Drive between the Tasman access road and John Renshaw Drive.

It is noted that the consent also required upgrading of the intersection of John Renshaw Drive and George Booth Drive to a seagull type intersection or an alternative configuration as determined by the RTA. The intersection was upgraded to a roundabout, as described above.

3.3 Historic Annual Average Daily Traffic on RMS Roads

The RMS publishes traffic volume data at selected locations on its roads. Available data on roads in the vicinity of Tasman was collated. Table 3.1 presents historic Annual Average Daily Traffic (AADT) data for the RMS'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 3.1 – Historic Annual Average Daily Traffic Data 1980 to 2004

Location	1980	1984	1988	1990	1992	1995	1998	2001	2004
George Booth Drive									
East of Richmond Vale Road	2,410	3,100	3,091	3,382	-	4,166	4,533	4,404	4,821
South of John Renshaw Drive	2,570	3,440	-	-	-	-	-	-	-
John Renshaw Drive									
West of George Booth Drive	8,700	9,580	11,058	15,438	16,730	11,602	13,215	13,011	16,241
East of George Booth Drive	6,880	7,110	8,390	15,299	-	-	8,689	7,144	11,657
West of F3 Freeway	5,500	7,510	7,005	9,773	-	-	20,217	22,228	28,020

The historic AADT volumes show that while traffic has generally increased over time, there was a distinct decrease in volumes on John Renshaw Drive between 1992 and 1995. Volumes on both John Renshaw Drive west of George Booth Drive and George Booth Drive east of Richmond Vale Road declined slightly between 1998 and 2001. These changes are probably attributable to the opening of the Palmers Road to Minmi section of the F3 Freeway in December 1993, and the opening of the Minmi to John Renshaw Drive section in late December 1998. Considering their significance in the road network, the opening of these sections of the freeway would have had widespread implications for the movement of vehicles in the region.

3.4 Hunter Expressway

The Hunter Expressway is currently under construction, and upon completion in late 2013, will provide a 40km dual carriageway connection between the F3 Freeway and New England Highway at Branxton. It will include interchanges at the F3 Freeway, Buchanan, Kurri Kurri, Loxford, Allendale, and Branxton.

The Hunter Expressway interchange at Buchanan is presently under construction. The Buchanan interchange will be a two lane, grade separated elliptical roundabout, where the Hunter Expressway passes under John Renshaw Drive. John Renshaw Drive will be realigned to join the north and south facing ramps and to cross the Hunter Expressway on two two-lane bridges. Buchanan Road, which presently intersects with John Renshaw Drive some 400m to the east of the George Booth Drive roundabout, will be realigned with a bridge over the Hunter Expressway to form a fourth leg of that roundabout. This work on and near John Renshaw Drive is partially completed.

The Hunter Expressway will run approximately parallel to George Booth Drive between the F3 Freeway and John Renshaw Drive, and is thus expected to significantly impact upon traffic conditions on both George Booth Drive and John Renshaw Drive.

The traffic analysis undertaken for the Lower Hunter Transport Needs Study examined a number of options for the F3 to Branxton link, including the then-approved route along a new road corridor between the F3 Freeway at the Newcastle Link Road interchange near Seahampton, and the New England Highway west of Branxton.

The study reported the daily traffic changes attributable to the Hunter Expressway on selected routes in the Lower Hunter, including both George Booth Drive and John Renshaw Drive for the year 2031 (Table 3.2). The daily traffic was compared with a base case, in which the Hunter Expressway is assumed to not be constructed. The study did not model the implications of the Hunter Expressway immediately upon opening, or in the short term.

Table 3.2 – Daily Two Way Traffic Forecast in 2031 (vehicles/day)

Location	Base Case	Hunter Expressway	Change
John Renshaw Drive west of F3 Freeway	36,600	34,600	-2,000
George Booth Drive west of F3 Freeway	11,600	800	-10,800

Source: Hyder, 2008

The results demonstrate that in 2031, the model predicts that the Hunter Expressway would result in a moderate decrease of around 5% in two way traffic on John Renshaw Drive, and a significant decrease of over 90% in two way traffic on George Booth Drive.

RMS has advised that the function of George Booth Drive is expected to change with the opening of the Hunter Expressway. As yet, a decision has not been reached regarding the future management of the road.

3.5 Cumulative Traffic Sources

3.5.1 Ammonium Nitrate Emulsion Production Facility

Approval has been granted for an Ammonium Nitrate Emulsion (ANE) production facility at Orica's Technology Park on Echidna Drive at Richmond Vale. An assessment of the potential traffic implications of the ANE Production Facility was prepared by Transport and Urban Planning Pty Ltd (2009).

Traffic generated by the approved ANE Production Facility includes transport of raw materials from the Orica facility at Kooragang Island and from Sydney, water deliveries from the local area, and transport of ANE product to locations predominantly in the Hunter Valley. Prior to the opening of the Hunter Expressway, raw materials transport uses John Renshaw Drive and George Booth Drive. Product distribution uses George Booth Drive between Echidna Drive and John Renshaw Drive, and John Renshaw Drive west of George Booth Drive.

Following the opening of the Hunter Expressway, all transport of raw materials to the site and all deliveries of ANE product from the Production Facility will use the Hunter Expressway to the Buchanan Interchange, then John Renshaw Drive and George Booth Drive to Echidna Drive.

Construction of the ANE Production Facility was planned to commence in 2010. Production was planned to commence in 2011 with 125,000 tpa product manufactured, increasing incrementally and reaching a maximum tonnage of 250,000 tpa of ANE product in approximately 2023. The facility would operate 24 hours per day, seven days per week, and the highest traffic generation is anticipated to occur on weekdays, as a significant proportion of deliveries would occur during weekday working hours. Orica intends to implement a Traffic Management Protocol and Code of Conduct for Drivers operating heavy vehicles to and from the Technology Centre to minimise the potential for associated traffic impacts.

Weekday Orica Site

- Prior to construction of the ANE Production Facility, 566 vehicle trips per day (512 light, 54 heavy).

Additional Weekday ANE Production Facility

- Construction – 106 vehicle trips per day (100 light, 6 heavy).
- Year 2011 – 70 vehicle trips per day (20 light, 50 heavy).
- Year 2013 – 80 vehicle trips per day (20 light, 60 heavy).
- Year 2018 – 100 vehicle trips per day (20 light, 80 heavy).
- Year 2023 – 120 vehicles per day (20 light, 100 heavy).

Additional AM and PM Peak Hour ANE Production Facility

- Construction – 40 vehicle trips per hour.
- Year 2011 – 14 vehicle trips per hour (6 light, 8 heavy).
- Year 2013 – 16 vehicle trips per hour (6 light, 10 heavy).
- Year 2018 – 18 vehicle trips per hour (6 light, 12 heavy).
- Year 2023 – 22 vehicle trips per hour (6 light, 16 heavy).

The assessment undertaken by Transport and Urban Planning Pty Ltd found that the traffic conditions in George Booth Drive and at the adjacent intersections would remain satisfactory to good with the additional Orica traffic.

As the Project traffic surveys were undertaken in 2011, some Orica ANE traffic movements would have been captured in the baseline traffic survey results (refer to Section 3.7.1). Donaldson has advised that construction of the ANE Production Facility is complete and therefore the operation of the facility can be assumed to be a cumulative traffic source for the Project.

While it is likely that the higher Orica construction movements (i.e. up to 40 vehicle trips per hour) were captured in the Project baseline surveys, for the purposes of this assessment it has been assumed that the predicted 2011 Orica ANE movements (i.e. 14 vehicle trips per hour) were captured in the baseline surveys.

3.5.2 Other Existing Local Cumulative Traffic Sources

Two other potential sources of local cumulative traffic generation have been identified in the vicinity of Tasman. These are the Daracon Quarry, which can use access roads on either George Booth Drive or John Renshaw Drive via Old Buttai Road (heavy vehicles primarily using Old Buttai Road), and the Pace Farm, which has an access onto George Booth Drive between John Renshaw Drive and Richmond Vale Road.

Existing light and heavy vehicle movements associated with these local commercial enterprises form part of the existing surveyed baseline traffic, where relevant. Due to the potential interaction of the Daracon Quarry access on George Booth Drive and the new Project pit top traffic, turning surveys were undertaken at this location (refer Section 3.10.1).

3.5.3 Lower Hunter Lands Project – Concept Plan

Coal and Allied Industries Limited has submitted a Concept Plan for the Black Hill Development area, which is located southwest of the intersection of John Renshaw Drive and F3 Freeway (**Figure 3**). While this proposal is only at a Concept Plan stage, the traffic documentation provided in support of the application (Hyder, 2010) indicates that it would potentially be a major contributor to future through traffic volumes on John Renshaw Drive, having access via a new signalised intersection on John Renshaw Drive to the east of the Donaldson access road.

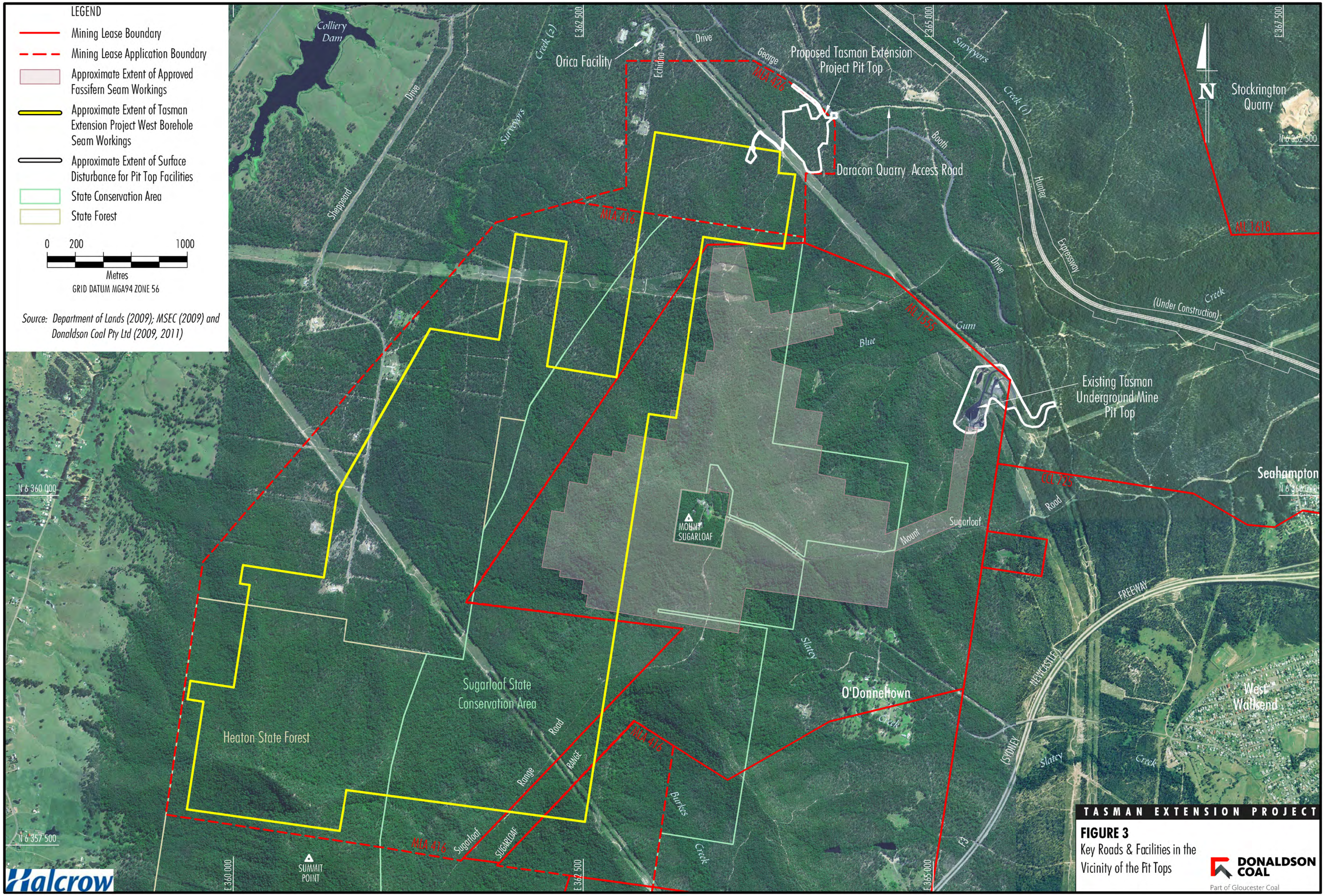

FIGURE 3
Key Roads & Facilities in the Vicinity of the Pit Tops

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It is noted that the Statement of Commitments for Black Hill (Coal and Allied, 2011) indicates that further detailed traffic modelling to meet RMS requirements would be undertaken for each subsequent Development Application, should the Concept Plan be approved. As the Project would contribute only very small traffic volumes on John Renshaw Drive to the east of the Donaldson access road (refer Section 4.2.7), it is unlikely that the Project would have any material impact on the Black Hill traffic modelling. However, future increases in through traffic on John Renshaw Drive would potentially increase delays to vehicles turning into and out of the Donaldson access road intersection (Section 4) and this should be considered in any traffic studies completed in support of future Development Applications for Black Hill.

3.6 Road Safety Review

Validated crash data was obtained from RMS Hunter Region for the most recent five year period of final data available, being from 1 July 2005 to 30 June 2010. The data is presented in **Attachment A**.

The data is based on crashes reported to the Police, and included George Booth Drive between the F3 Freeway and John Renshaw Drive, and John Renshaw Drive between New England Highway at Beresfield and the township of Kurri Kurri. There were 186 reported crashes in the study area, which included four fatal crashes, 88 injury crashes, and 94 non-injury tow-away crashes. The RMS data nominates speed as a factor in 45 of the accidents, and fatigue as a factor in 17 of the accidents.

3.6.1 *George Booth Drive (excluding its intersection with John Renshaw Drive)*

A review of the locations of the crashes along George Booth Drive indicates that crashes tended to occur in clusters, although there was not any one location where a significant grouping of accidents occurred. Of the 55 crashes on George Booth Drive, the following are noted:

- 29 (53%) identified speed as a contributing factor.
- 8 (15%) identified fatigue as a contributing factor.
- 21 (38%) occurred on a wet road surface.
- 17 (31%) occurred during rain.
- 22 (40%) occurred in darkness.

- 35 (64%) were single vehicle crashes.
- 46 (84%) crashes were not at an intersection.
- 25 (45%) were single vehicle crashes in which a vehicle left the carriageway or lost control on a curve.
- 9 (16%) were head-on crashes unrelated to overtaking manoeuvres.
- 6 (11%) were rear-end crashes.
- 6 (11%) were single vehicle crashes in which a vehicle left the carriageway or lost control on a straight section of road.
- 1 fatal crash occurred, involving a pedestrian lying or sitting on the carriageway in darkness.
- 28 crashes (51%) were non-casualty.
- 3 crashes (6%) involved articulated trucks.

Review of George Booth Drive accident data indicates that speed is a significant factor in a large proportion of the crashes which have occurred over recent years. This has resulted in a significant number of single vehicle crashes where a driver has lost control of the vehicle and left the carriageway. While overtaking opportunities are provided along parts of George Booth Drive, only one crash was directly related to an overtaking manoeuvre.

3.6.2 John Renshaw Drive (including its intersection with George Booth Drive)

A review of the locations of the crashes along John Renshaw Drive indicates that crashes tended to be spread along its length, rather than in clusters as was noted on George Booth Drive. However, there was a notable grouping of accidents at and near the roundabout at John Renshaw Drive/F3 Freeway/Weakleys Drive.

Of the 131 crashes on John Renshaw Drive, the following is noted:

- 16 (12%) identified speed as a contributing factor.
- 9 (7%) identified fatigue as a contributing factor.
- 25 (19%) occurred on a wet road surface.
- 17 (13%) occurred during rain.
- 23 (18%) occurred in darkness.

- 26 (20%) were single vehicle crashes.
- 65 (50%) crashes were not at an intersection.
- 42 (32%) were rear-end crashes.
- 21 (16%) were at an intersection between vehicles on adjacent approaches.
- 11 (8%) were single vehicle crashes in which a vehicle left the carriageway or lost control on a straight section of road.
- 10 (8%) were between vehicles turning in parallel lanes (i.e. side swipe).
- 8 (6%) were single vehicle crashes in which a vehicle left the carriageway or lost control on a curve.
- 3 fatal crashes occurred, one involving a pedestrian walking on the carriageway in darkness, one involving a single car leaving the carriageway on a bend in rain and darkness and hitting a utility pole, and one involving a motorcycle pulling out to overtake being hit by a car travelling in the opposite direction. Speed was identified as a contributing factor in the latter two fatal crashes.
- 66 crashes (51%) were non-casualty.
- 10 crashes (8%) involved articulated trucks.

The review of John Renshaw Drive indicates that the most prevalent type of crash occurred between vehicles travelling in the same direction, i.e. rear end crashes, lane change crashes and side swipe (same direction) crashes. Together these accounted for 55 (42%) of the crashes. Speed and fatigue were less often identified as contributing factors in the crashes on John Renshaw Drive.

3.6.3 Donaldson Coal Complaints Data

Donaldson Coal also provided data on reported incidents involving their vehicles. Between June 2007 and February 2012, 41 complaints were recorded which directly involved a coal haulage truck on John Renshaw Drive or George Booth Drive. No crashes involving coal trucks were reported.

- 31 complaints involved coal falling from trucks or rocks being thrown up by trucks and either hitting a following vehicle or landing on the carriageway;
- 8 complaints involved the behavior of a truck driver; and
- 2 complaints regarded truck noise (same complainant).

The eight complaints regarding driver behaviour are summarised below:

- 19 September 2007 truck driving without fog lights;
- 28 September 2007 at the end of dual carriageway (John Renshaw Drive) a truck forced three vehicles onto wrong side of the road;
- 24 January 2008 car driver had to brake heavily to avoid truck pulling out from the side of John Renshaw Drive;
- 14 February 2008 truck half on wrong side of the road at the Tasman access road;
- 9 March 2009 truck driver on the phone pulled out from Donaldson and out across road without indicating, forcing car off the road;
- 18 August 2009 trucks travelling in convoy (general issue, not specific incident);
- 8 February 2010 trucks travelling too close to car at speed on John Renshaw Drive; and
- 2 June 2010 truck driver did not use passing lane on George Booth Drive.

3.7 Existing Traffic Volumes and Composition

3.7.1 Project Traffic Volume Surveys

Traffic survey data has been collated on roads around Tasman. At each location, hourly traffic volumes were recorded by direction, and the classification of vehicles was also undertaken using the Austroads (2004) Vehicle Classification System, which is included in **Attachment B** with the traffic survey results.

The surveys were conducted over one week at the following locations (**Figure 4**):

Site 1	Tasman access road;
Site 2	George Booth Drive south of John Renshaw Drive; and
Site 3	John Renshaw Drive west of the Donaldson access road.

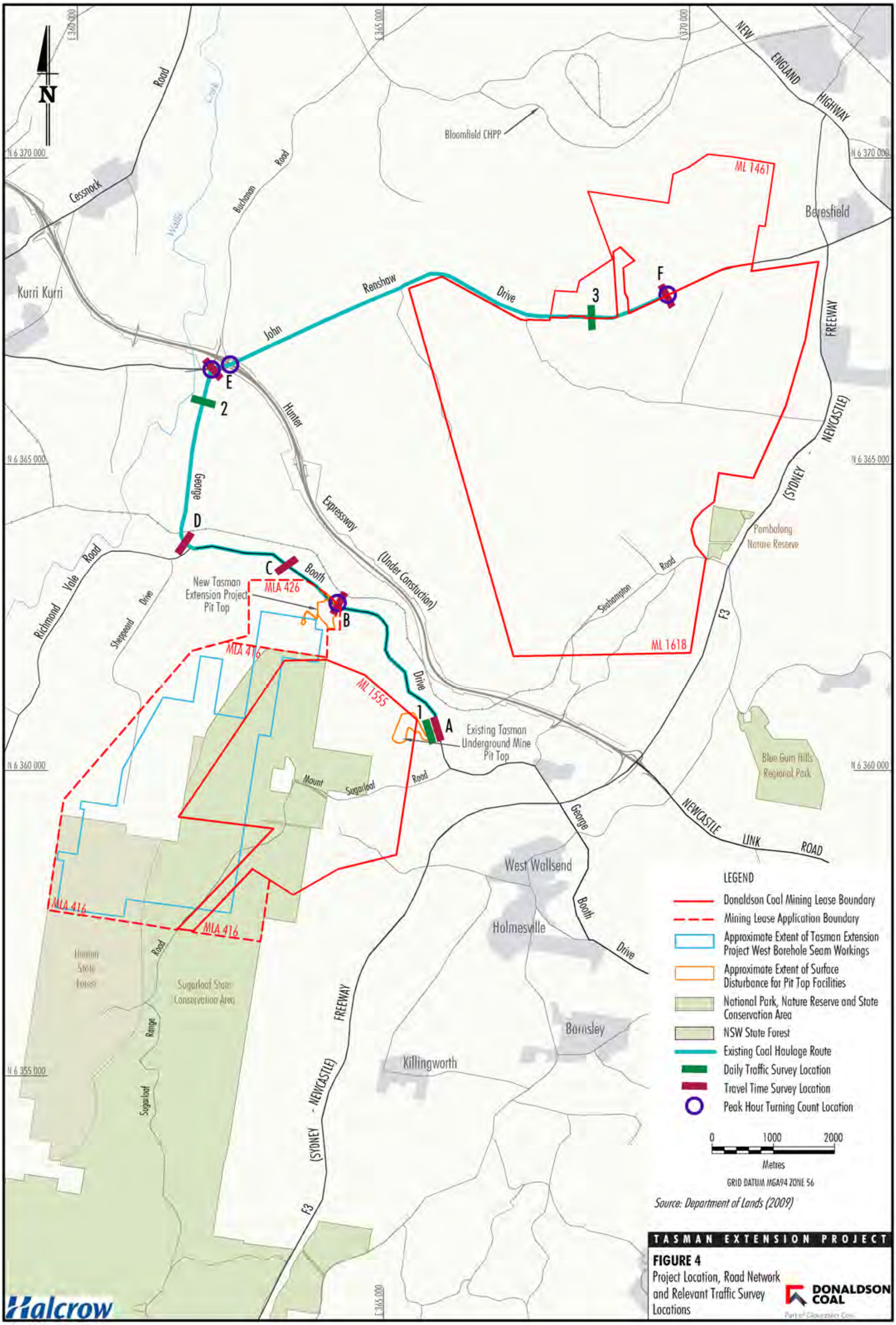

FIGURE 4
Project Location, Road Network and Relevant Traffic Survey Locations

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The surveys were conducted over the week of 19 May to 25 May 2011, however due to a data error, only the data from John Renshaw Drive were available for that period. The three surveys were repeated during July 2011, which was partly during the school holidays. To gauge the impacts of school holidays on traffic conditions, the results from the two surveys on John Renshaw Drive were compared. This comparison indicated that the average daily total volume was 3% higher outside school holidays than during the school holidays. This small variation is well within the day-to-day variations in traffic volumes expected on roads of this nature, noting also that during the surveys, George Booth Drive and John Renshaw Drive were both carrying "atypical" traffic loads associated with construction activity for the Hunter Expressway and Buchanan Interchange. It is expected that the activity on the Tasman access road would not be impacted by school holidays. In the context of the roads under investigation, for which midblock conditions are the main factor determining traffic conditions (rather than intersection capacity), the minor effect of the school holidays on background traffic is considered to be very low, and unlikely to make any significant difference to the assessment which follows.

Nevertheless, to ensure a robust assessment, the remainder of this report uses the following base condition volumes:

- John Renshaw Drive – as surveyed in May 2011;
- George Booth Drive – July 2011 surveyed volumes increased by 3% to account for school holiday effects; and
- Tasman access road – as surveyed in July 2011.

3.7.2 Existing Traffic Volumes 2011

The daily volume results of the traffic surveys are summarised in Table 3.3, and full results are presented in **Attachment B**.

Table 3.3 – Existing Daily Two Way Traffic Volumes (vehicles/day)

	Tasman Mine Access	George Booth Drive	John Renshaw Drive
Monday	522	8,531	9,310
Tuesday	444	8,954	10,286
Wednesday	414	9,299	9,914
Thursday	393	9,337	10,304
Friday	333	9,250	10,249
Saturday	94	6,135	6,835
Sunday	44	4,638	5,254
Average Weekday	421	9,074	10,013

It is noted that, in comparison to the 2008 survey results of Transport and Urban Planning Pty Ltd (2009), the survey results at Site 2 (George Booth Drive south of the John Renshaw Drive intersection) indicate significant growth in total traffic movements from late 2008 to mid-2011. It is likely that much of this growth is attributable to the Hunter Expressway construction traffic.

Average weekday conditions are clearly distinct from weekend days on all the surveyed roads, with Saturday and Sunday daily volumes on the public roads being less than 70% and around 50% respectively of the average weekday daily volume.

Tasman generated an average of 421 vehicle trips per day on the weekdays, noting that this varied between 333 and 522 vehicle trips per day over the surveyed weekdays. On Saturday, Tasman generated 94 vehicle trips per day.

Table 3.4 summarises the peak hour traffic volumes, noting that the morning peak hour results are for the busiest hour before midday, and the evening peak hour results are for the busiest hour after midday. They do not necessarily occur at the same time at the three locations or at the same time each day.

Table 3.4 – Existing Peak Hour Two Way Traffic Volumes (vehicles/hour)

	Tasman Mine Access		George Booth Drive		John Renshaw Drive	
	AM Peak	**PM Peak**	**AM Peak**	**PM Peak**	**AM Peak**	**PM Peak**
Monday	41	47	772	898	785	829
Tuesday	42	40	798	927	853	948
Wednesday	31	43	805	893	799	974
Thursday	41	40	813	939	857	902
Friday	35	24	776	943	784	889
Saturday	19	17	543	524	583	563
Sunday	6	9	439	461	457	485
Average Weekday[A]	38	34	790	917	810	904

[A] The peak hour on the Average Weekday may not be the average of the individual peak hours Monday to Friday due to peaks occurring during different hours on different days.

The results indicate that the average weekday peak hour traffic volumes are typically between 8% and 10% of the daily total. This is within the typical range of between 8% and 12%.

On the average weekday, the on-street peak hours on George Booth Drive occurred between 6.00am and 7.00am, and between 4.00pm and 5.00pm. The on-street peak hours on John Renshaw Drive occurred between 7.00am and 8.00am, and between 4.00pm and 5.00pm. It is noted however that on John Renshaw Drive, the survey data shows a distinct increase in traffic during the two hour period from 6.00am to 8.00am compared with the hours before and after. There was very little difference between the volume surveyed between 6.00am and 7.00am of 799 vehicles per hour, and that surveyed between 7.00am and 8.00am of 810 vehicles per hour. The average weekday morning peak hour on the Tasman access road occurred between 6.00am and 7.00am, and the evening peak hour between 4.00pm and 5.00pm.

3.7.3 *Traffic Composition*

The surveys described in Section 3.7.1 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 3.5 summarises the composition of the traffic on the average weekday over the survey period.

Table 3.5 – Existing Traffic Composition

Road and Location	Vehicles		Percent	
	Light	Heavy	Light	Heavy
Average Weekday				
Tasman Mine Access	249	172	59.1	40.9
George Booth Drive	8,188	885	90.2	9.8
John Renshaw Drive	8,777	1,234	87.7	12.3
Saturday				
Tasman Mine Access	94	0	100.0	0.0
George Booth Drive	5,832	302	95.1	4.9
John Renshaw Drive	6,514	307	95.5	4.5

It is noted that, including the existing Tasman coal haulage trips, the percentage of heavy vehicles was within expectations for similar roads on both George Booth Drive and John Renshaw Drive, noting that rural roads typically carry around 10% heavy vehicles. It is noted that while the proportion of heavy vehicles remain reasonably stable for each of the weekdays on the public roads, it varied on the Tasman access road. On the surveyed Friday, the proportion of heavy vehicles was 30.3% of the daily traffic, and on the surveyed Wednesday, it was 49.0% of the daily traffic.

3.7.4 *Components of Surveyed Mine Traffic*

The contribution of Tasman to the surveyed traffic volumes on the surrounding roads has been calculated based upon the typical weekday and Saturday profiles of traffic presented in Section 2.1, and is presented in Table 3.6. The number of coal truck trips on each day during the survey week was provided by Donaldson Coal.

Table 3.6 – Estimated Distribution of Surveyed Daily Mine Traffic (vehicles/day)

Road and Location	Heavy Vehicles		Light Vehicles		Total
	Coal	Deliveries	Employees	Deliveries	
Average Weekday					
Tasman Mine Access					
Existing	149	24	154	94	421
George Booth Drive					
South of Existing Mine Access	0	17	116	66	199
North of Project Mine Access	149	7	38	28	222
John Renshaw Drive					
East of Donaldson Access	0	3	8	9	20
West of Donaldson Access	149	3	8	9	169
Saturday					
Tasman Mine Access					
Existing	0	0	94	0	94
George Booth Drive					
South of Existing Mine Access	0	0	71	0	71
North of Project Mine Access	0	0	23	0	23
John Renshaw Drive					
East of Donaldson Access	0	0	5	0	5
West of Donaldson Access	0	0	5	0	5

Comparison of the traffic generation of Tasman as described in Table 3.6 with the total surveyed traffic and composition in 2011 (Table 3.3 and Table 3.5) indicates the following for the key coal haulage route:

- On George Booth Drive at Site 2 North of the Tasman access (**Figure 4**), Tasman contributes less than 3% of the surveyed total traffic, including approximately 18% of the surveyed heavy vehicle traffic.
- On John Renshaw Drive at Site 3 West of the Bloomfield CHPP (**Figure 4**), Tasman contributes less than 2% of the surveyed total traffic, including approximately 12% of the surveyed heavy vehicle traffic.

This indicates that on the existing average weekday, Tasman makes only a small contribution to total traffic flows on these roads, and that coal haulage trucks are not the dominant source of heavy vehicles on these roads.

With Tasman coal haulage at the maximum permitted rate of 236 trips per day, the contribution of Tasman to heavy vehicle traffic would increase to approximately 25% of total heavy vehicles on George Booth Drive (Site 2) and 18% of total heavy vehicles on John Renshaw Drive (Site 3).

3.7.5 *Total Tasman Underground Mine Peak Hour Traffic Generation*

The contribution of Tasman to the surveyed traffic volumes on the surrounding roads during the typical on-street peak hours has been estimated based upon the profiles of heavy and light traffic each hour on the Tasman access road, and the likely spread of trips made by the various users of the access road throughout the day. It is noted that the surveyed flows suggest that the traffic is spread over more time than the shift change times would suggest, i.e. there is less "peaking" of traffic at the shift changeover times as employee arrival and departure times are spread out.

Table 3.7 summarises the existing traffic generation of Tasman during the on-street peak hours on a weekday, based on the surveyed and maximum permitted traffic generated by the various mine activities as discussed above. This assumes that the maximum permitted 12 loaded trucks departing Tasman would be matched by 12 empty trucks returning during the same hour. It is noted that coal haulage does not occur prior to 7.00am (Section 2.1.1) however as a conservatively robust assessment of the possible impacts of the Project, the on-street peak period is being considered.

Table 3.7 – Estimated Weekday Peak Hour Tasman Mine Traffic (vehicles/day)

Road and Location	Heavy Vehicles		Light Vehicles		Total
	Coal	Deliveries	Employees	Deliveries	
Survey Average Weekday					
Daily	149	24	154	94	421
AM Peak	5	5	28	0	38
PM Peak	12	0	17	5	34
At Maximum Coal Haulage					
Daily	236	24	154	96	510
AM Peak	24	5	28	0	57
PM Peak	24	0	17	5	46

Comparison of the daily and peak hourly results in Table 3.7 indicates that the surveyed Tasman peak hour traffic was approximately 8-9% of the daily total traffic, and would comprise some 9-11% of daily traffic should maximum daily coal haulage occur together with maximum coal haulage during the peak hours.

3.8 Existing Travel Times

A survey of vehicle travel times along the haul route was conducted in May 2011. The survey recorded travel times along the public road sections of the haul route in both directions between 7.00am and 10.00pm. The survey vehicle typically travelled at the speed of the general traffic, following slower vehicles as needed, with some sample runs recording the speed of coal haulage trucks.

Travel times were recorded at six locations along the route, which are shown on **Figure 4**, and located as follows:

A. Tasman access road intersection
B. Existing Daracon Quarry access road approximately 3km west of Tasman
C. Orica access road approximately 1km farther west of that
D. Richmond Vale Road intersection
E. Roundabout at George Booth/John Renshaw
F. Donaldson access road intersection

The results of the travel time survey are presented in **Attachment B**, in terms of average and approximate 85th percentile travel speeds over each road section. The 85th percentile speed is the speed below which 85% of the traffic travels. It is noted that the number of sample speeds recorded is not sufficient to report the 85th percentile speed accurately, however those reported in Table 3.8 are over all vehicles surveyed, and may be considered to be representative of the 85th percentile speed. Typically, the 85th percentile speed is around the posted speed limit. It should be noted that the survey vehicle drivers found it difficult to survey the coal haulage trucks, as the truck drivers tended to pull over to allow the survey vehicle to pass. Coal truck drivers were not informed of the presence of the survey vehicles to ensure that driver behaviour was typical. The number of coal trucks surveyed on each section varied from two to five, thus it is not feasible to calculate the 85th percentile speed from the available data.

Table 3.8 – Travel Time Survey Vehicle Speeds Summary (kilometres per hour)

	Distance (m)	Speed Limit	All Vehicles Average Speed	All Vehicles 85th Percentile Speed	Coal Trucks Average Speed	General Traffic Average Speed	General Traffic 85th Percentile Speed
Tasman to Donaldson							
Tasman to Daracon	3,010	80	62.3	71.4	57.6	63.4	71.2
Daracon to Orica	1,080	80	72.4	80.1	70.9	72.1	78.9
Orica to RVale Rd	1,770	80[A]	75.0	79.5	70.9	75.6	79.2
RVale Rd to Rndbt	2,760	80[A]	64.8	70.9	59.3	66.3	71.0
Roundabout to CHPP	8,060	100	81.5	88.9	75.0	83.5	90.2
Total	16,680		73.1	80.4	67.7	74.4	80.7
Donaldson to Tasman							
CHPP to Roundabout	8,060	100	79.5	84.1	76.2	80.0	84.4
Rndbt to RVale Rd	2,760	80[A]	72.0	76.1	67.3	72.5	76.3
RVale Rd to Orica	1,770	80[A]	75.9	82.0	78.4	75.7	77.9
Orica to Daracon	1,080	80	75.0	78.6	77.5	74.6	77.1
Daracon to Tasman	3,010	80	66.8	71.5	61.5	68.1	72.6
Total	16,680		75.0	79.6	71.8	75.5	79.5

[A] Note advisory speed 45km/h near Richmond Vale Rd, and 60km/h limit on George Booth Dr near roundabout

Of note for future trucking from the new pit top, the loaded coal haulage trucks took an average of 188 seconds (3.1 minutes) to travel along George Booth Drive from the Tasman access road intersection to the Daracon Quarry access intersection. The empty trucks took an average of 176 seconds (2.9 minutes) to travel the return distance from the Daracon Quarry access intersection to Tasman.

3.9 *Existing Levels of Service*

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 Transportation Research Board's (2000) *Highway Capacity Manual* (which is 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 is defined as a qualitative measure describing the operational conditions within a traffic stream as perceived by drivers and/or passengers. A Level of Service definition generally describes these conditions in terms of factors such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort, convenience and safety. Level of Service A provides the best traffic conditions, with no restriction on desired travel speed or overtaking. Level of Service B to D describes progressively worse traffic conditions. Level of Service 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 Level of Service E is taken as the capacity of a lane or roadway.

HCM 2000 and Austroads (2009) present a guide to the Levels of Service attained under various traffic volume demands on two way, two lane roads. This assumes a nominal capacity of 3,200 passenger car equivalents per hour (pc/hr) for the two way flow. A heavy vehicle is equivalent to a number of passenger car equivalents, with the adjustment factor being dependent upon local conditions. The Levels of Service are presented in Table 3.9, and their equivalent volume/capacity ratio is also presented.

Table 3.9 – Levels of Service on Two Way Two Lane Roads

Level of Service	Maximum Volume per Hour	Maximum Volume/Capacity
A	490	0.15
B	780	0.24
C	1,190	0.37
D	1,830	0.57
E	3,200	1.00

Source: HCM 2000, Capacity = 3,200 pc/hr

An approximation of the capacity of the travel lanes on the surveyed roads can be made by considering adjustment factors given by Austroads (2009) for lane widths, lateral clearances, and heavy vehicles. The nominal capacities of the surveyed roads were calculated, and the resulting Levels of Service during the average weekday peak hour are presented in Table 3.10.

Table 3.10 – Existing Peak Hour Levels of Service at Maximum Coal Haulage

	Capacity (vehicles/hour)	Volume (vehicles/hour)	Volume/Capacity Ratio	Level of Service
Weekday 6.00 to 7.00am [A]				
Tasman Mine Access	1,257	57	0.05	A
George Booth Drive	2,322	809	0.35	C
John Renshaw Drive	2,842	818	0.29	C
Weekday 4.00 to 5.00pm				
Tasman Mine Access	1,252	46	0.04	A
George Booth Drive	2,550	929	0.36	C
John Renshaw Drive	2,886	905	0.31	C
Saturday Peak				
Tasman Mine Access	3,200	19	0.01	A
George Booth Drive	2,746	543	0.20	B
John Renshaw Drive	3,048	583	0.19	B

[A] Coal haulage does not occur prior to 7.00am, however for the purpose of this assessment, is conservatively included in the on-street peak hour

It is noted that the calculated capacities are influenced by the surveyed proportion of heavy vehicles during the peak hour under investigation. When the proportion of heavy vehicles is reduced, the total number of vehicles able to be carried on the road is increased, and vice versa. The calculated "capacity" of the road therefore differs between the morning and evening peak hour conditions due to the differences in the contribution of heavy vehicles to total volumes.

This is a general assessment for planning purposes only, rather than a detailed assessment of the particular characteristics of these roads. Most notably, it does not take into account the presence of the existing overtaking lanes, which improve the Level of Service along a route. It assumes that coal haulage occurs at the maximum rate during the peak hours, i.e. 12 loaded trucks departing Tasman, which are assumed to be matched by 12 empty returning vehicles during the same hour.

This general assessment suggests that the Levels of Service experienced on these roads are satisfactory during the weekday and Saturday peak hours.

3.10 Existing Operation of Intersections

Intersections are typically the critical locations in the road network, due to the need for conflicting movements to occupy the same road space. The operation of key intersections relevant to the Project is discussed in this section.

3.10.1 Project Intersection Traffic Surveys

Surveys of vehicle turning movements were undertaken on Thursday 2 February 2012 between 6.00am and 9.00am, and between 3.00pm and 6.00pm at the intersections of:

- George Booth Drive with the Daracon Quarry access road;
- George Booth Drive with John Renshaw Drive;
- John Renshaw Drive with Buchanan Road; and
- John Renshaw Drive with the Donaldson access road.

These time periods were surveyed to quantify traffic conditions at the intersections during the on-street peak periods determined through the traffic volume surveys (refer Section 3.7.2). The latter two surveys included only the movements into and out of the minor road, with estimates of through movements being made by reference to adjacent intersections.

It is noted that during the survey period, work was being undertaken on the Hunter Expressway Buchanan interchange, which would be expected to influence traffic conditions, particularly in the vicinity of Buchanan Road and the roundabout at George Booth Drive and John Renshaw Drive. Daracon Group has indicated that the Daracon access road was being used by Hunter Expressway construction traffic at the time of the surveys. Such influences would tend to result in increased traffic volumes due to construction traffic, and thus the surveyed conditions are considered to be busier than would otherwise be expected.

The peak hour results of those surveys are summarised in Table 3.11, noting that the peak hours at the different intersections did not occur during the same time period. The intersections of John Renshaw Drive with George Booth Drive and Buchanan Road have been considered together as a single intersection with regard to identifying the peak hour, in consideration of their proximity and the plan to reconstruct this as a four way intersection as part of the Hunter Expressway project (Section 3.4). The full survey results are presented in **Attachment B**.

Table 3.11 – Surveyed Peak Hour Traffic at Intersections February 2012 (vehicles/hour)

Road	Location	AM Peak	PM Peak
Donaldson Access Road and John Renshaw Drive		6.00-7.00am	4.00-5.00pm
Donaldson Access Road	North of John Renshaw Drive	120	106
Daracon Quarry Access Road and George Booth Drive		7.30-8.30am	4.45-5.45pm
Daracon Access Road	East of George Booth Drive	24	22
George Booth Drive	South of Daracon Quarry Access	985	1,202
	North of Daracon Quarry Access	997	1,206
George Booth Drive, John Renshaw Drive and Buchanan Road		7.45-8.45am	4.45-5.45pm
Buchanan Road	North of John Renshaw Drive	547	624
George Booth Drive	South of John Renshaw Drive	809	1,031
John Renshaw Drive	West of George Booth Drive	1,436	1,830
	East of George Booth Drive	1,247	1,405
	East of Buchanan Road	768	887

Note: includes effects of Hunter Expressway construction traffic

3.10.2 Existing Intersection Operation

The operation of the intersections was analysed using SIDRA Intersection, an analysis programme which determines characteristics of intersections operating conditions including the degree of saturation, average delays, and levels of service. The degree of saturation, or x-value, is the ratio of the arrival rate of vehicles to the capacity. The operating characteristics can be compared with the performance criteria set out in Table 3.12. It is noted that average delay per vehicle is expressed in seconds per vehicle and is measured for the movement with the highest average delay at roundabout and priority intersections such as those surveyed.

Table 3.12 – Level of Service Criteria

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

The results of the analysis are presented in Table 3.13, noting that the reported average delay is for the movement with the highest average delay per vehicle at these three intersections.

Table 3.13 – Existing Intersection Conditions (Surveyed February 2012)

Intersection	Morning Peak Hour			Evening Peak Hour		
	X-value	AD	LOS	X-value	AD	LOS
George Booth Drive and John Renshaw Drive	0.60	17.0	B	0.57	18.1	B
George Booth Drive and Daracon Quarry Access	0.34	71.8	F	0.44	47.6	D
John Renshaw Drive and Donaldson Access	0.25	17.9	B	0.25	16.3	B

AD = Average Delay per Vehicle (seconds per vehicle) worst movement
LOS = Level of Service

The results indicate that the three intersections currently operate at satisfactory levels of service, with the exception of the Daracon Quarry access road intersection. The modelling suggests that vehicles turning right into or out of the Daracon Quarry access road can experience long delays. It is noted that these delays are experienced by only a small number of vehicles per hour, and that the overtaking lane in George Booth Drive can allow vehicles turning right out of the Quarry to conduct a de facto staged turn which is not included in the SIDRA model. Through traffic on George Booth Drive in both directions experiences little or no delay at the intersection.

It is noted that Level of Service C suggests that a review of accidents at an intersection may be warranted. The crash record review (refer to Section 3.6) found that there were no crashes reported at the Daracon Quarry intersection during the five years investigated.

3.11 Bus Routes

George Booth Drive is not used by any regular public bus services. Hunter Valley Buses operates Route 267 between Wallsend and West Wallsend. This route occasionally operates on George Booth Drive westwards to Seahampton.

Hunter Valley Buses operates two school buses each school day, one in the morning, and one in the afternoon. They travel along Buchanan Road, John Renshaw Drive, George Booth Drive and Richmond Vale Road to near Sheppeard Drive. The morning bus 252 travels empty southbound along the route, turning left into George Booth Drive at approximately 7.45am. The school route then starts at Sheppeard Drive, and travels back to Buchanan Road, turning right into John Renshaw Drive at approximately 8.01am. This bus picks up near Sheppeard Drive, and at one location on George Booth Drive. In the afternoon, the loaded bus travels the same route, turning left into George Booth Drive at 4.00pm. It drops students near Sheppeard Drive, and at one location on George Booth Drive at 4.10pm, then returns empty to Buchanan Road.

Rover Coaches operates Route 160 between Cessnock and Kurri Kurri, which uses John Renshaw Drive.

4 Future Road Transport Conditions

The traffic expected to be generated by the Project and the resulting future traffic conditions on the surrounding road network under the three future scenarios described in Section 2.3 are discussed in this chapter.

4.1 *Non-Project Traffic Changes*

Irrespective of the Project, changes to traffic conditions can be expected on both George Booth Drive and John Renshaw Drive. These changes would be the result of natural growth in traffic, and most significantly, the opening of the Hunter Expressway expected in late 2013 (refer to Section 3.4).

The historic AADT data for George Booth Drive and John Renshaw Drive (refer to Section 3.3) indicate that daily traffic volumes have generally increased over time, with decreases which are likely to have been the result of the opening of new sections of the F3 Freeway. Considering the changes in traffic conditions resulting from those "one off" changes to the road system, it is difficult to use the historical growth figures to predict future traffic volumes. Furthermore, the opening of the Hunter Expressway is also expected to have a material impact on traffic volumes on George Booth Drive and John Renshaw Drive, as discussed in Section 3.4.

Hyder (2008) presents traffic forecasts on George Booth Drive and John Renshaw Drive, for the base case conditions, i.e., without the Hunter Expressway (Table 4.1). The 2006 forecasts are compared with RMS count data, noting that the forecasts are average weekday vehicles per day, while the counts are axle pairs.

Table 4.1 – Base Case Daily Two Way Traffic Forecast (vehicles/day)

Location	Count	2006	2016	2026	2031
John Renshaw Dr west of F3 Freeway	7,962[A]	10,200	23,000	32,200	36,600
John Renshaw Dr west of George Booth Dr	16,241[B]	19,100	30,700	37,700	42,300
George Booth Dr west of F3 Freeway	4,821[B]	4,600	8,600	10,200	11,600

Source: Hyder (2008)
[A] 2006 Average Weekday Traffic
[B] RMS AADT for 2004

Interpolating between the 2006 and 2016 forecasts in Table 4.1, it is evident that even taking into account the differences in the locations between the Project traffic surveys and the Hyder forecasts, the forecasts do not closely match the existing conditions on John Renshaw Drive or George Booth Drive.

In order to estimate future traffic volumes, the percentage rate of growth from the Hyder (2008) forecasts has therefore been used to develop adjusted base case forecasts from 2011 for the scenario years in this assessment.

As discussed in Section 3.4, the opening of the Hunter Expressway is expected to result in a moderate decrease of around 5% in two way traffic on John Renshaw Drive, and a significant decrease of over 90% in two way traffic on George Booth Drive, based on the 2031 forecasts prepared by Hyder. In the absence of more detailed forecasts, these percentage decreases have been applied to the adjusted base case forecasts to reflect the impacts of the opening of the Hunter Expressway in 2013.

Table 4.2 summarises the resulting growth factors to be applied to the measured 2011 traffic volumes to reflect the combined effects of increases in traffic resulting from general growth and decreases in traffic resulting from the opening of the Hunter Expressway at the end of 2013. The 2013 factors below refer to prior to opening of the Hunter Expressway.

Table 4.2 – Forecast Daily Two Way Background Traffic Growth Factors

Year	John Renshaw Dr West of F3 Freeway	John Renshaw Dr West of George Booth Dr	George Booth Dr West of F3 Freeway
Year 2011	1.000	1.000	1.000
Year 2013[A]	1.154	1.093	1.121
Year 2017	1.362	1.192	0.092
Year 2029	1.984	1.536	0.115

[A] Prior to opening of the Hunter Expressway

It is noted that based on the Hyder assessment, the resulting growth rates on John Renshaw Drive west of F3 freeway would be greater than those west of George Booth Drive.

The higher rates have been used in the assessment which follows, noting that the difference between these rates is quite significant over time: the higher rate suggests a nearly doubling of volumes by 2029, while the lower rate suggests slightly more than a 50% increase. The Hyder (2008) forecasts, on which these growth rates are based, included large potential employment generating developments off John Renshaw Drive to the east of the Bloomfield CHPP. Although details of traffic generation and distribution from that modelling are not presented in the Hyder (2008) report, it is considered likely that significantly more of the traffic from these developments would travel to and from the east than the west. The Hyder (2008) forecast for John Renshaw Drive west of the F3 Freeway is therefore likely to include significant volumes associated with these employment land sites, whereas the forecast for John Renshaw Drive west of George Booth Drive is likely to have included lesser volumes to/from these sites. The Hyder (2008) forecasts may therefore overestimate the future increases in traffic on John Renshaw Drive between George Booth Drive and these future development sites.

Table 4.3 presents the forecasts of background average weekday and Saturday daily traffic on the surrounding roads, i.e., excluding all traffic associated with Tasman. This includes the effects of background growth in traffic described above, together with the predicted additional operational traffic generated by the ANE Production Facility on Echidna Drive (refer Section 3.5).

Table 4.3 – Daily Background (Non-Tasman Mine) Traffic Volumes (vehicles/day)

	Year 2011	Year 2013	Year 2017	Year 2029
Average Weekday				
George Booth Drive				
South of Existing Mine Access	8,852	9,925	810	1,021
North of Project Mine Access	8,852	9,925	810	1,021
John Renshaw Drive				
West of Donaldson Access	9,843	11,367	13,409	19,560
Saturday				
George Booth Drive				
South of Existing Mine Access	6,112	6,853	559	705
North of Project Mine Access	6,112	6,853	559	705
John Renshaw Drive				
West of Donaldson Access	6,830	7,888	9,317	13,574

Excludes traffic associated with Tasman.

4.2 Project Traffic Generation

4.2.1 Project Pit Top Works Employees

The pit top works include the construction of the new pit top and decommissioning of the existing pit top.

Construction of the new pit top would take place in 2013 and 2014, and would employ 20 contractors. Construction would take place between 7.00am and 6.00pm, with all contract employees present on the site. For the purposes of the assessment, it is estimated that the approach and departure routes of the construction employees would be similar to those of the existing employees (refer to Section 2.1.2). Conservatively, it is assumed that there would be no car pooling of construction employees, who would thus generate 40 vehicle trips per day. These would all be light vehicles, and would travel to and from the new pit top access road location.

Decommissioning of the existing pit top has been assumed to take place in 2017, and is estimated to employ similar numbers of personnel as the construction works. These employees would travel to and from the existing pit top access road.

4.2.2 Project Pit Top Works Deliveries and Visitors

Construction activity associated with the pit top construction and decommissioning would generate some additional deliveries (e.g. additional potable water, fuel, equipment and general consumables) and visitor vehicles above existing levels. For the purpose of this assessment, it is assumed that deliveries and visitors associated with the pit top construction activity in 2013 would be in the order of 65 vehicle trips per day. Deliveries and visitors associated with the decommissioning activity (2017) would be lower, at around 30 vehicle trips per day.

4.2.3 Project Waste Rock Transport

Construction of the new pit top would generate waste rock, which is proposed to be transported off-site to the Donaldson Open Cut site using the existing coal haul route. This would occur during 2013, and would take place on weekdays between 7.00am and 6.00pm.

The maximum of trips generated by waste rock haulage and coal haulage combined (refer to Section 4.2.4) would be 236 vehicle trips per day, which is the existing maximum number of trips permitted for coal transport. This assessment assumes that waste rock transport would generate half of this combined maximum, or up to 118 heavy vehicle trips per day between the new pit top access and the Donaldson access road.

Combined with the coal haulage trucks (refer to Section 4.2.4), a maximum of 20 truck departures per hour is proposed, which would generate up to 40 heavy vehicle trips per hour, assuming the loaded truck trips are matched by empty return trips during the same hour.

4.2.4 *Project Coal Haulage*

The movement of coal and waste rock (refer to Section 4.2.3), between Tasman and the Donaldson access road would generate a combined maximum of 236 heavy vehicle trips per day during 2013, prior to the opening of the Hunter Expressway.

This assessment assumes that coal transport would generate half of this combined maximum, or up to 118 heavy vehicle trips per day between the existing pit top access and the Donaldson access road. Combined with the waste rock haulage trucks (refer to Section 4.2.3), a maximum of 12 truck departures per hour is proposed, which would generate 24 heavy vehicle trips per hour in 2013, assuming loaded truck trips are matched by empty returning vehicles within the same hour.

Following completion of the construction work for the new pit top and the opening of the Hunter Expressway, the transport of coal would increase to a maximum of 178 truck loads per day (356 truck trips per day). A maximum of 20 truck departures per hour has been adopted, which would generate 40 heavy vehicle trips per hour, assuming loaded truck trips are matched by empty returning vehicles within the same hour.

The existing pit top would remain in use until 2015, and the new pit top would be brought into use from 2014. During 2014 and 2015, the trucks being used to haul coal would use both the existing access and the new access to George Booth Drive.

On weekdays, coal truck movements would be restricted to the hours of 7.00am to 10.00pm. On Saturdays, coal truck movements would be limited to a maximum of 50 departures per day, and Saturday trucking would be limited to the hours of 7.00am to 6.00pm, on a maximum of 26 Saturdays per year.

4.2.5 *Project Operational Employees*

The number of operational employees would remain at 110 full time personnel until 2013, and would then increase to approximately 150 employees from 2014 and beyond. The opening of the Hunter Expressway is not likely to impact significantly on the distribution of most employee trips on the road network. Employees travelling to and from Kurri Kurri and Cessnock regions would be likely to have a faster trip on the Hunter Expressway to the Buchanan Interchange rather than along John Renshaw Drive. Employees travelling to and from the east would not be as likely to use the Hunter Expressway, as they would have to travel a substantially longer distance westwards to the Buchanan Interchange then back to Tasman along George Booth Drive, where George Booth Drive from the east would be quicker despite its lower speed environment. For this assessment, it is therefore assumed that the distribution of employee trips on the road network would remain similar to the existing situation, with the exception that employees to and from Kurri Kurri and Cessnock region (approximately 9% of total employees) would transfer to the Hunter Expressway from John Renshaw Drive. It is assumed that the level of car pooling would remain the same as the existing situation. It is further assumed that shift times and the relative number of employees per shift would remain the same as existing, i.e. on a typical weekday, 34 of the 151 employees would be rostered off, and the 117 employees remaining would generate some 212 vehicle trips per day.

On the Saturdays when coal haulage occurs, this would be done to reduce stockpiled coal. One additional employee would be required on the site to drive the front end loader, however there would be little variation to the existing number of employees. Due to the significantly lower background traffic and Tasman generated traffic on Saturdays (and Sundays), weekdays are more relevant to the following traffic assessment (and particularly intersection performance). Notwithstanding, daily traffic generation analysis has been undertaken for Saturdays to demonstrate the much lower traffic volumes that would occur.

The existing pit top would remain in use until 2015, and the new pit top would be brought into use from 2014. During 2014 and 2015, operational employees would use both the existing and the new accesses to George Booth Drive.

4.2.6 *Project Operational Deliveries and Visitors*

With the increase in coal production, it is anticipated that there would be a corresponding increase in the number of delivery and visitor trips. This assessment conservatively assumes that the 50% increase in maximum coal transport per day would result in a 50% increase in the number of delivery and visitor trips.

Deliveries and visitors are therefore anticipated to generate some 180 vehicle trips per day after 2014, of which 20% would be heavy vehicles.

During 2014 and 2015, operational deliveries and visitors would use both the existing and the new accesses to George Booth Drive.

4.2.7 *Total Project Traffic Generation*

The total volume of traffic generated by the Project for each of the three scenarios discussed in Section 2.3 is presented in Table 4.4, which includes a comparison with the existing Tasman traffic. A breakdown of the trips by the various Project activities for each scenario is provided in **Attachment C**.

Table 4.4 – Estimated Distribution of Tasman/Project Vehicle Trips (vehicles/day)

	Year 2011	Year 2013	Year 2017	Year 2029
Average Weekday				
Tasman Mine Access				
Existing	424	392	70	0
New	0	223	748	748
George Booth Drive				
South of Existing Mine Access	200	275	338	287
North of Project Mine Access	224	340	480	461
John Renshaw Drive				
East of Donaldson Access	20	29	34	29
West of Donaldson Access	170	265	390	385
Saturday				
Tasman Mine Access				
Existing	96	96	0	0
New	0	0	196	196
George Booth Drive				
South of Existing Mine Access	73	73	73	73
North of Project Mine Access	23	23	123	123
John Renshaw Drive				
East of Donaldson Access	5	5	5	5
West of Donaldson Access	5	5	105	105

Assumes coal and waste rock haulage at maximum rates

As shown in Table 4.4, the estimated Project contribution to total movements on John Renshaw Drive east of the Donaldson access road is very low and does not warrant any further assessment in this report.

4.3 *Future Daily Traffic Volumes*

4.3.1 *Future Daily Traffic Volumes – No Project*

Without the proposed Project, Tasman would continue operating for a period. Should this occur, there would be traffic implications following its closure, in order to decommission the facilities. For the purpose of this analysis, it has been assumed that it would generate similar volumes of traffic as anticipated for the decommissioning of the existing pit top under the Project conditions in 2017.

Table 4.5 presents the forecasts of average weekday and Saturday daily traffic on the surrounding roads, assuming that the Project does not proceed, and that Tasman ceases mining operations approximately at the end of 2014. This includes the effects of background growth in traffic described above, together with the additional traffic generated by the ANE Production Facility on Echidna Drive (refer Section 3.5) and decommissioning activity in 2017.

Table 4.5 – Daily Traffic Volumes – No Project (vehicles/day)

	Year 2011	Year 2013	Year 2017	Year 2029
Average Weekday				
Tasman Mine Access				
Existing	510	510	70	0
New	0	0	0	0
George Booth Drive				
South of Existing Mine Access	9,052	10,125	861	1,021
North of Project Mine Access	9,162	10,235	829	1,021
John Renshaw Drive				
West of Donaldson Access	10,099	11,623	13,414	19,560
Saturday				
Tasman Mine Access				
Existing	96	96	0	0
New	0	0	0	0
George Booth Drive				
South of Existing Mine Access	6,185	6,926	559	705
North of Project Mine Access	6,135	6,876	559	705
John Renshaw Drive				
West of Donaldson Access	6,835	7,893	9,317	13,574

Note: assumes maximum coal haulage rate until closure of Tasman Underground Mine

Thus, without the Project, the most significant change in traffic volumes would occur on George Booth Drive as a result of the opening of the Hunter Expressway in late 2013.

4.3.2 *Future Daily Traffic Volumes – With Project*

Table 4.6 summarises the daily traffic volumes expected on the surrounding roads with the proposed Project, assuming that coal haulage takes place at the maximum rates proposed.

Table 4.6 – Future Two Way Daily Traffic With Project (veh/day)

	Year 2011	Year 2013	Year 2017	Year 2029
Average Weekday				
Tasman Mine Access				
Existing	510	392	70	0
New	0	223	748	748
George Booth Drive				
South of Existing Mine Access	9,052	10,200	1,148	1,308
North of New Mine Access	9,162	10,265	1,290	1,482
John Renshaw Drive				
West of Donaldson Access	10,099	11,632	13,799	19,945
Saturday				
Tasman Mine Access				
Existing	96	96	0	0
New	0	0	196	196
George Booth Drive				
South of Existing Mine Access	6,185	6,926	632	778
North of New Mine Access	6,135	6,876	682	828
John Renshaw Drive				
West of Donaldson Access	6,835	7,893	9,422	13,679

Note: assumes maximum waste rock and coal haulage rates

Comparing the average daily volumes with and without the Project (Table 4.5 and Table 4.6) it is evident that the background growth in traffic and the changes in traffic resulting from the opening of the Hunter Expressway would be more significant than the traffic generated by the Project.

Table 4.6 demonstrates that when coal haulage occurs on a Saturday, the resulting traffic volumes on the surrounding roads would remain well below the average weekday volumes.

Comparing Table 4.4 and Table 4.6, the contribution of Tasman traffic to total traffic on the haul route on George Booth Drive and John Renshaw Drive can be determined (Table 4.7).

Table 4.7 – Tasman's Contribution to Total Traffic with the Project

Location	Year 2011	Year 2013	Year 2017	Year 2029
Average Weekday				
George Booth Drive	2.4%	3.3%	37.2%	31.1%
John Renshaw Drive	1.7%	2.3%	2.8%	1.9%
Saturday				
George Booth Drive	0.4%	0.3%	18.0%	14.9%
John Renshaw Drive	0.1%	0.1%	1.1%	0.8%

Assumes haulage at maximum permitted rates

Tasman would therefore generally make only a small contribution to the total traffic on the roads. In 2017, when peak coal haulage occurs, the Project contribution to total traffic on George Booth Drive would be around 37% on weekdays, however this increase in contribution is a function of the total traffic volumes on George Booth Drive declining by a very large margin due to the opening of the Hunter Expressway. This is shown in Table 4.6, which indicates that with the Project in 2029, average weekday volumes on George Booth Drive would be expected to be around 16% of the existing traffic.

With regard to heavy vehicles and assuming coal haulage at the maximum rate, George Booth Drive would presently carry some 972 heavy vehicles per day north of Tasman, of which 243 would be associated with Tasman. Assuming that the proportion of background heavy vehicles, i.e. those not associated with Tasman, would remain at its existing level, in 2017 with the Project and maximum coal haulage, George Booth Drive north of Tasman would be expected to carry 439 heavy vehicles per day, of which 372 vehicles per day would be associated with Tasman. The contribution of Tasman to overall heavy vehicle volumes would increase, however the total number of heavy vehicles on George Booth Drive would be less than half the existing number.

4.4 Peak Hour Project Traffic Generation

The estimated traffic generation of the Project during the weekday on-street peak hours is summarised in Table 4.8. Additional details regarding the derivation of these volumes and the underlying assumptions are provided in **Attachment C**. As the Saturday Project traffic would be significantly lower than the average weekday Project traffic, and background Saturday traffic would also be lower, the Saturday peak hour does not require assessment. It follows that if the average weekday peak hour conditions are satisfactory, the Saturday peak hour conditions (when coal haulage occurs at lower rates and workforce movements are less) would also be satisfactory.

Table 4.8 – Estimated Weekday Peak Hour Tasman Mine Traffic Generation

Year	Daily	AM	PM
2011	510	57	46
2013	615	71	53
2017	818	96	77
2029	748	86	72

Assumes coal and waste rock haulage at maximum rates

The estimated distribution of Tasman traffic during the weekday on-street peak hours is presented in Table 4.9.

Table 4.9 – Tasman Mine Vehicle Trips During Weekday Peak Hours (vehicles/hour)

	Year 2011		Year 2013		Year 2017		Year 2029	
	AM	PM	AM	PM	AM	PM	AM	PM
Tasman Mine Access								
Existing	57	46	45	35	11	5	0	0
New	0	0	26	18	86	72	86	72
George Booth Drive								
South of Existing Mine Access	25	17	35	21	42	28	35	24
North of New Mine Access	32	30	36	32	55	49	52	48
John Renshaw Drive								
West of Donaldson Access	26	25	27	26	44	42	43	42

Assumes coal and waste rock haulage at maximum rates

4.5 Future Midblock Levels of Service

The impact of the future traffic volumes with and without the Project on Levels of Service during the average weekday peak hours has been reviewed, and the results are summarised in Table 4.10. Full results are presented in **Attachment C.** Again it is noted that this is a general assessment only, which assumes a single travel lane in each direction and does not take the positive impacts of overtaking lanes into account, which act to reduce the interaction between vehicles and improve the Level of Service.

Table 4.10 – Estimates of Midblock Levels of Service

	No Project		With Project	
	6.00 to 7.00am[A]	**4.00 to 5.00pm**	**6.00 to 7.00am[A]**	**4.00 to 5.00pm**
Existing Mine Access Rd				
2011	A	A	-	-
2013	A	A	A	A
2017	A	A	A	A
New Mine Access Rd				
2013	-	-	A	A
2017	-	-	A	A
2029	-	-	A	A
George Booth Drive				
2011	C	C	-	-
2013	C/D	D	D	D
2017	A	A	A	A
2029	A	A	A	A
John Renshaw Drive				
2011	C	C	-	-
2013	C	C	C	C
2017	D	D	D	D
2029	E	E	E	E

Assumes coal and waste rock haulage at maximum hourly rates
[A] Coal haulage and waste rock haulage would not occur prior to 7.00am, however for the purpose of this assessment, is conservatively added to the on-street peak hour.

The table demonstrates that while Levels of Service on George Booth Drive and John Renshaw Drive can be expected to decline as background growth continues, the Project traffic would have no impact on the predicted Levels of Service on George Booth Drive and John Renshaw Drive. This is to be expected given that the Project is predicted to only contribute some 2% of total traffic in 2029 on John Renshaw Drive and that the total traffic volumes on George Booth Drive would be much lower than the existing levels due to the opening of the Hunter Expressway.

It should be noted that the higher of the two growth factors suggested by Hyder (2008) has been applied to arrive at these estimates. Should this higher growth eventuate, measures may be required to address the capacity of John Renshaw Drive in the future, regardless of whether or not the Project proceeds, however as noted above, it is considered likely that the growth rates used may overestimate the growth in traffic on John Renshaw Drive between George Booth Drive and Black Hill.

4.6 Future Peak Hour Operation of Intersections

The peak hour operation of the key intersections has been assessed using SIDRA Intersection, to determine what influence the forecast changes in traffic conditions could be expected to have on their operating conditions. It is noted that no information is available regarding forecasts of the effects of the Hunter Expressway and background traffic growth on peak hour turning movements at any of the intersections. The forecast increases in daily traffic volumes would not necessarily result in a similar proportional increase in peak hourly traffic. However in the absence of detailed forecasts of hourly conditions, the analysis which follows assumes that the hourly background traffic increases (or decreases) over time would be at the same rate as daily background traffic increases.

Further, the analyses which follow assume that the busiest hours for traffic generated by the Project would coincide with the busiest hours surveyed at the intersections in February 2012 (Section 3.10.1). This will tend to result in an overestimate of future traffic volumes, and thus conservatively high estimates of future delays and low estimates of spare intersection capacity.

4.6.1 *George Booth Drive, John Renshaw Drive and Buchanan Road*

The roundabout at the intersection of George Booth Drive and John Renshaw Drive is planned to be altered with the construction and opening of the Hunter Expressway. Buchanan Road will be realigned to form a fourth northern leg to the roundabout. The Hunter Expressway Alliance general arrangement plans of the future layout of the roundabout indicate that George Booth Drive is to remain with a single approach and a single departure lane; Buchanan Road is proposed to have a single departure lane and double approach lanes over a length of approximately 130m; John Renshaw Drive is to have two approach and two departures lanes on both its approaches, narrowing to a single lane in each direction approximately 90m to the west of the roundabout. The roundabout would have two circulating lanes on its northern and southern sides, and single circulating lanes on the eastern and western sides. The speed limit on all approaches is to be 60km/hr.

As the existing intersection turning movement surveys were conducted during the atypical construction period of the Hunter Expressway, it is expected that the surveyed volumes are higher than would otherwise have been expected. The results at the intersections of John Renshaw Drive with George Booth Drive and Buchanan Road are expected to have been significantly impacted, given their proximity to the construction work.

Given the levels of uncertainty resulting from both the extent to which construction traffic affected the survey results, and the lack of information on the implications of the opening of the Hunter Expressway on peak hour conditions and intersection turning movements, it is not considered that any reasonable degree of accuracy can be assured regarding forecasting of future turning movements at the future intersection of George Booth Drive and John Renshaw Drive and Buchanan Road. The redesign of this intersection, together with the Buchanan Interchange, were undertaken with the objective to provide sufficient demand for the long term.

To review the general future operation of the intersection, it has therefore been considered with regard to the spare capacity available during the peak times once the intersection upgrades have been undertaken (Table 4.11).

Table 4.11 – George Booth Drive-John Renshaw Drive Operating Conditions

	Surveyed February 2012[A]		**2012 Volumes Upgraded[B]**	
	AM Peak	**PM Peak**	**AM Peak**	**PM Peak**
X-value	0.60	0.57	0.54	0.47
Average Delay	17.0	18.1	14.6	16.3
Level of Service	B	B	B	B
Effective Intersection Capacity (vehicles)	3,063	3,920	3,456	4,852
Demand (vehicles)	1,839	2,245	1,874	2,301
Spare Capacity (vehicles)	1,224	1,675	1,582	2,551

[A] Three way roundabout excluding Buchanan Road
[B] Four way roundabout including Buchanan Road

The results demonstrate that under the existing, albeit atypically high, traffic demands, the new roundabout would provide significant additional capacity during both the morning and evening peak hours. Table 4.9 indicates that the greatest increases in peak hour Tasman traffic generation would occur in 2017, at which time, the Project would contribute 54 and 49 vehicles through the intersection during the morning and evening peak hours respectively. It is estimated that during the surveys, Tasman contributed some 13 and 18 vehicles during the morning and evening peak hours respectively. The additional traffic through the intersection in 2017 as a result of the Project would therefore be in the order of 30 to 40 vehicles, assuming coal haulage occurs at the maximum rate permitted. This is a very small portion of the spare capacity available, and of the total traffic through the intersection.

The roundabout has been designed to accommodate the longer term demands following completion of the Hunter Expressway, and the Project's contribution to those demands would be very low.

4.6.2 *George Booth Drive, New Project Access and Daracon Quarry Access*

The proposed roundabout at the intersection of George Booth Drive with the Daracon Quarry access road and the Tasman new pit top access road would have single approach and departure lanes on all four legs, with a single circulating lane. The operation of the proposed roundabout has been assessed with estimated turning movements with the Project traffic for the future years. This assumes that the peak hour through traffic on George Booth Drive would increase and decrease at the same rate as the daily traffic forecast rates (Table 4.2).

Table 4.12 – George Booth Drive-New Project Access Operating Conditions

	Morning Peak Hour			Evening Peak Hour		
	X-value	**AD**	**LOS**	**X-value**	**AD**	**LOS**
Year 2013	0.44	21.5	B	0.52	17.9	B
Year 2017	0.07	14.8	B	0.12	15.7	B
Year 2029	0.07	14.8	B	0.09	15.7	B

The results demonstrate that the intersection can be expected to operate at good levels of service during the morning and evening peak hours with the Project, and the morning peak hour performance for vehicles turning right out of the Daracon Quarry would be improved. It is noted that the largest portion of the average delays reported above are associated with the time taken to negotiate the roundabout, rather than waiting for a suitable gap in the traffic stream.

The roundabout would have spare capacity for additional traffic should the Daracon Quarry alter their access arrangements to increase use of the George Booth Drive access in the future. As a test of capacity for increased movements in and out of the Daracon Quarry, the proposed roundabout was assessed for 2029, but assuming that there would be 200 heavy vehicles turning left and right into and out of Daracon Quarry, i.e. a total of 800 heavy vehicles. Under this scenario, the roundabout would operate at Level of Service C, and would still retain spare capacity.

4.6.3 *John Renshaw Drive and Donaldson Access*

The existing layout of the intersection of John Renshaw Drive and the Donaldson Access would be retained. This is a “seagull” intersection with a storage lane in John Renshaw Drive for vehicles waiting to turn right into Donaldson, and a staged crossing for vehicles turning right out of Donaldson prior to joining the westbound traffic stream in John Renshaw Drive.

The operation of the intersection has been assessed using SIDRA, assuming no changes are made to layout of the intersection, and that coal haulage from Tasman to the Bloomfield CHPP occurs at the maximum hourly rate, matched by an equal number of empty trucks returning during the same hour (Table 4.13). It is noted that the assessment overestimates the number of trucks turning into and out of the access road, as given the uncertainty in the number of Tasman trucks using the access during the surveyed peak hour, the maximum number of coal trucks permitted in an hour has been added to the surveyed turning movements.

Table 4.13 – John Renshaw Drive-Donaldson Access Operating Conditions

	Morning Peak Hour 7-8am			Evening Peak Hour 4-5pm		
	X-value	**AD**	**LOS**	**X-value**	**AD**	**LOS**
Year 2012	0.25	32.2	C	0.25	20.1	B
Year 2013	0.27	34.6	C	0.27	21.4	B
Year 2017	0.33	50.2	D	0.33	27.3	B
Year 2029	0.56	>100	F	0.47	44.1	D

Assumes maximum hourly coal (and waste rock) haulage

The results demonstrate that the peak Project traffic in the short to medium terms would be readily accommodated by this intersection. Should the high rate of traffic growth forecast by Hyder (2008) eventuate, excessive delays may result at the intersection of John Renshaw Drive and the Donaldson access in the long term, assuming that coal haulage occurs at the maximum rate during the on-street peak hours. These delays would be to vehicles turning right out of Donaldson against the heavy eastbound flows. Through traffic on John Renshaw Drive would not be impacted by the small increase to turning movements in and out of the Donaldson access.

It is reiterated that the analysis is considered to be conservative, assuming high peak hour growth on John Renshaw Drive, combined with maximum coal haulage being matched by an equal number of trucks in the reverse direction during the same hour, and also coinciding with the peak hour background traffic (as discussed in Section 2.3, in practice coal haulage and delivery traffic is expected to be dropping off in the final years of the Project, however this assessment assumes it remains constant at maximum rates). However, this may potentially represent a traffic growth scenario that could eventuate with the development of the Black Hill site to the east of the Bloomfield CHPP, should it proceed.

The Project would have only a minor contribution to the intersection operating conditions reported in Table 4.13, as it would increase peak hour through volumes on John Renshaw Drive by only a small number of trips, primarily associated with the additional employees travelling to and from Tasman. The number of Project trucks turning in and out of Donaldson at peak times would also be relatively low.

It is noted that Level of Service C suggests that a review of accidents at an intersection may be warranted. The crash record review (Section 3.6) found that there were no crashes reported at the Donaldson access road intersection during the five years investigated.

Given the level of uncertainty in the traffic forecasts at this intersection, it is recommended that the operation of this intersection be monitored periodically to determine whether any measures are required to address delays experienced by vehicles turning in or out of the Donaldson access road.

4.7 Project Coal Haulage Travel Characteristics

The relocation of the pit top access from its existing location would decrease the overall distance travelled by Tasman traffic to and from the north, and increase the distance travelled to and from the south. This would reduce the time and distance travelled by the coal haulage trucks on the public roads.

The impacts of the Project on annual Vehicle Kilometres of Travel (VKT) and annual Vehicle Hours of Travel (VHT) for the haulage trucks are presented in Table 4.14.

Table 4.14 – Haulage Truck Annual Travel Characteristics

	Existing	Maximum	Proportion of Existing
Coal per Year (tonnes)	975,000	1,500,000	154%
Haulage Truck Trips per Year	55,714	85,714	154%
Vehicles Kilometres Travelled per Year	929,314	1,171,714	126%
Vehicle Hours of Travel per Year	13,340	16,179	121%

The results demonstrate that due to the proposed relocation of operations to the new pit top on George Booth Drive, the proposed 54% increase in the coal haulage truck trip generation would result in only a 26% increase in travel distance and 21% increase in travel time associated with coal haulage.

4.8 Buses

The small traffic increases resulting from the Project are unlikely to have any measurable impact on the existing school bus services on George Booth Drive (Section 3.11) prior to opening of the Hunter Expressway. Following the opening of the Hunter Expressway, traffic volumes on George Booth Drive would decline, and thus there would a reduced probability of interaction between school buses and general traffic on George Booth Drive. Considering the shift times, the peak times for Project traffic generation would not necessarily coincide with the movement of school buses on George Booth Drive.

4.9 Car Parking

Car parking would be provided on-site to meet the expected demands.

4.10 *Road Safety*

In 2006, Donaldson undertook various upgrading works at the private driveways on George Booth Drive on the haulage routes. These upgrading included shoulder widening to provide a 3.5m wide through lane and 3.0m wide shoulder, with driveways adjacent to the shoulder widening adjusted to suit the widened pavement and sealed, and driveways opposite the shoulder widening sealed.

During recent consultation, a number of landholders who have private driveways on George Booth Drive expressed further concerns regarding their access to and from George Booth Drive with the continuing presence of haulage trucks on the route.

Donaldson Coal has commissioned a driveway safety review of the private driveway accesses on George Booth Drive between John Renshaw Drive and Richmond Vale Road. As a result of that review, Donaldson Coal will commit to further upgrade works on this section of George Booth Drive as may be deemed necessary. Such works may include additional widening of shoulders and improved signage, and are outlined in the Main Text of the Environmental Impact Statement.

4.11 *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.

The proposed route for any oversize vehicles would be negotiated with RMS and relevant local councils on a case-by-case basis. 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.

5 Conclusions

- On an average weekday, Tasman currently contributes less than 3% of the total traffic on George Booth Drive and less than 2% of the total traffic on John Renshaw Drive.
- At the existing maximum haulage rate, Tasman can currently contribute up to 25% of heavy vehicles on George Booth Drive and 18% of heavy vehicles on John Renshaw Drive. The maximum number of haulage trucks generated by Tasman would remain at the existing level until after the Hunter Expressway is opened.
- The Project would increase the maximum total weekday traffic generation of Tasman (operating at maximum coal haulage rates) from 510 vehicles per day to 818 vehicles per day.
- The length of each coal haulage trip on the public roads would be reduced by approximately 3km with the development of the new pit top, with the proposed 54% increase in the coal haulage task resulting in a corresponding 26% increase in VKT and 21% increase in VHT.
- Before the opening of the Hunter Expressway, the Project would contribute less than 4% of total weekday traffic on George Booth Drive and less than 3% of total weekday traffic on John Renshaw Drive.
- After the opening of the Hunter Expressway and at Project maximum coal haulage rates, weekday total traffic on George Booth Drive will decline well below existing levels and the Project would contribute less than 3% of total weekday traffic on John Renshaw Drive.
- After the opening of the Hunter Expressway and at Project maximum coal haulage rates Saturday total traffic on George Booth Drive will decline well below existing levels and the Project would contribute approximately 1% of total Saturday traffic on John Renshaw Drive. Project Saturday coal haulage would be limited to a maximum of 26 Saturdays per year.
- Donaldson Coal has commissioned a review of private driveway accesses on George Booth Drive and the results of this review are detailed in the Main Report of the Environmental Impact Statement.

- Long term growth forecasts presented in this report reference forecasts and modelling work undertaken by Hyder (2008) which take into consideration forecasts of significant employment and population growth in the Lower Hunter Region. Application of these forecasts to peak hour conditions suggest that all relevant intersection performances would be satisfactory in the short to medium term, and that the performance of the new roundabout on George Booth Drive would be satisfactory in the long term. Application of these forecasts to traffic on John Renshaw Drive indicates possible lengthy delays to vehicles exiting the Donaldson access road could occur in the long term (i.e. 2029).
- It is recommended that long term monitoring of the operation of the intersection of the Donaldson access road with John Renshaw Drive be undertaken to review the impacts of increasing through traffic on the intersection performance, particularly if the Black Hill site is developed to the east of the intersection.

Overall, this study has found that the extension of the life of Tasman would have only minor impacts on the operation of the surrounding road system, and would reduce the road system's exposure to individual coal haulage truck trips with the reduction in distance travelled by each truck trip on the public roads.

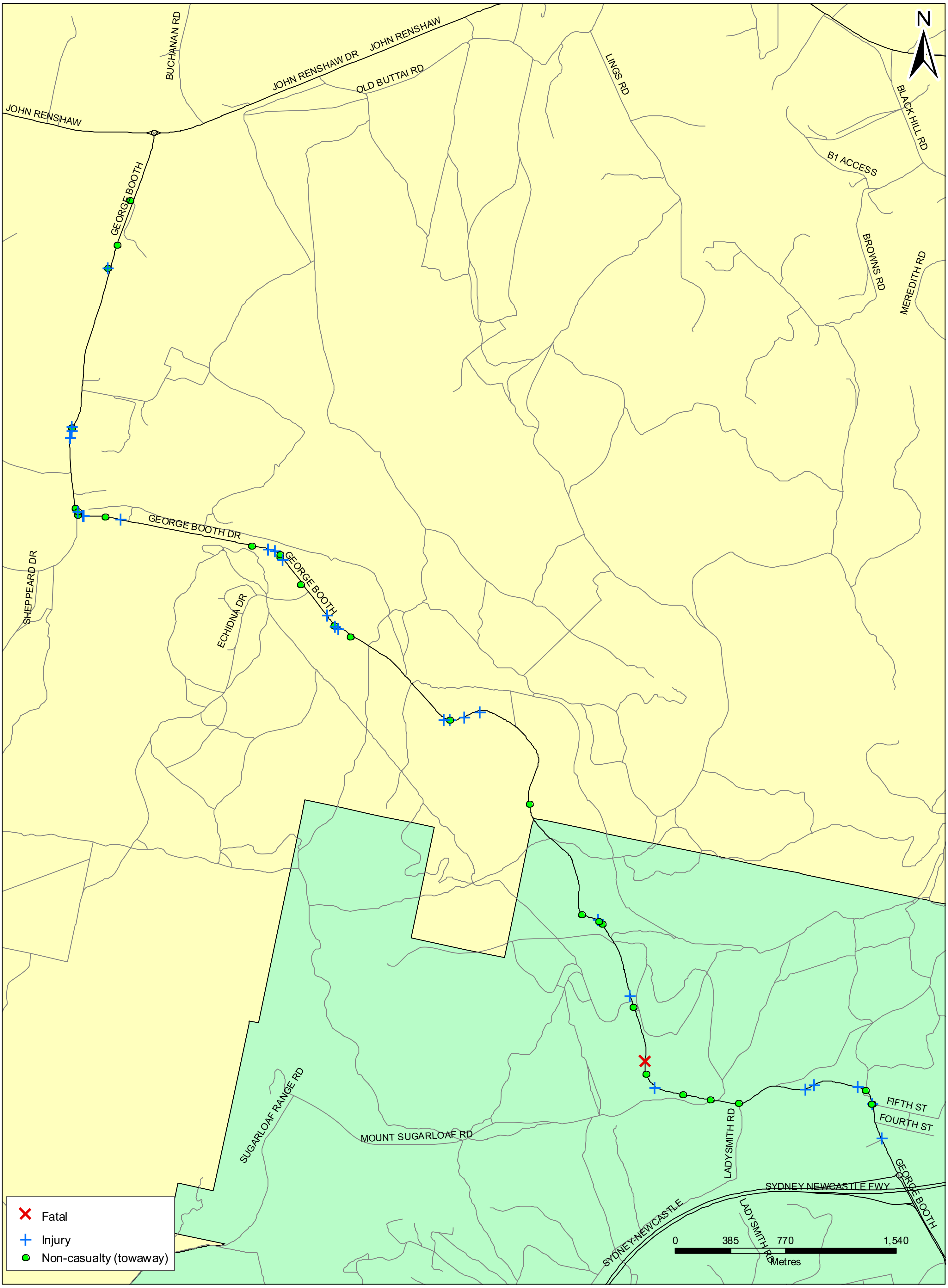
The opening of the Hunter Expressway and forecast growth in background traffic not associated with the Project would have significantly more impact on the operation of the road system than the Project traffic generation. The proposed roundabout on George Booth Drive at the new Project pit top is predicted to improve the Level of Service for existing turning movements out of the Daracon Quarry access road and provide additional turning capacity at this intersection. The Project's contribution to overall traffic conditions on George Booth Drive and John Renshaw Drive would be such that no significant impacts on the performance, capacity, efficiency and safety of the road network are expected to arise as a direct result of the Project.

It is recommended that the operation of the intersection of the Donaldson access road and John Renshaw Drive be monitored in the future, with particular regard to the impacts that increasing background levels of through traffic on John Renshaw Drive would have on traffic turning into and out of the Donaldson access road.

Attachment A. RTA Crash Data

George Booth Drive between F3 (Exc) to John Renshaw Dr (Exc)

Crashes period 1/7/2005 to 30/06/2010 (Finalised data).



 Bronwyn Bosse June 2011

Summary Crash Report

RTA

# Crash Type		
Car Crash	45	81.8%
Light Truck Crash	7	12.7%
Rigid Truck Crash	0	0.0%
Articulated Truck Crash	3	5.5%
'Heavy Truck Crash	(3)	(5.5%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(3)	(5.5%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	4	7.3%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	1	1.8%

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

Location Type		
*Intersection	9	16.4%
Non intersection	46	83.6%

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

Collision Type		
Single Vehicle	35	63.6%
Multi Vehicle	20	36.4%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	55	100.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	29	52.7%
Fatigue	8	14.5%

Weather		
Fine	31	56.4%
Rain	17	30.9%
Overcast	6	10.9%
Fog or mist	1	1.8%
Other	0	0.0%

Road Surface Condition		
Wet	21	38.2%
Dry	34	61.8%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	1	1.8%
Daylight	28	50.9%
Dusk	4	7.3%
Darkness	22	40.0%

Crash Movement		
Intersection, adjacent approaches	1	1.8%
Head-on (not overtaking)	9	16.4%
Opposing vehicles; turning	0	0.0%
U-turn	0	0.0%
Rear-end	6	10.9%
Lane change	0	0.0%
Parallel lanes; turning	1	1.8%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	2	3.6%
Off road, on straight	0	0.0%
Off road on straight, hit object	5	9.1%
Out of control on straight	1	1.8%
Off road, on curve	1	1.8%
Off road on curve, hit object	23	41.8%
Out of control on curve	1	1.8%
Other crash type	5	9.1%

Speed Limit			~ 40km/h or less	0	0.0%
40 km/h or less	0	0.0%	80 km/h zone	38	69.1%
50 km/h zone	0	0.0%	90 km/h zone	4	7.3%
60 km/h zone	9	16.4%	100 km/h zone	2	3.6%
70 km/h zone	2	3.6%	110 km/h zone	0	0.0%

CRASHES	55	
Fatal crash	1	1.8%
Injury crash	26	47.3%
Non-casualty crash	28	50.9%

CASUALTIES	33	
Killed	1	3.0%
Injured	32	97.0%
^ Unrestrained	0	0.0%

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

Time Group			% of Day
00:01 - 02:59	0	0.0%	12.5%
03:00 - 04:59	3	5.5%	8.3%
05:00 - 05:59	2	3.6%	4.2%
06:00 - 06:59	1	1.8%	4.2%
07:00 - 07:59	6	10.9%	4.2%
08:00 - 08:59	1	1.8%	4.2%
09:00 - 09:59	1	1.8%	4.2%
10:00 - 10:59	1	1.8%	4.2%
11:00 - 11:59	0	0.0%	4.2%
12:00 - 12:59	0	0.0%	4.2%
13:00 - 13:59	2	3.6%	4.2%
14:00 - 14:59	0	0.0%	4.2%
15:00 - 15:59	3	5.5%	4.2%
16:00 - 16:59	9	16.4%	4.2%
17:00 - 17:59	7	12.7%	4.2%
18:00 - 18:59	6	10.9%	4.2%
19:00 - 19:59	1	1.8%	4.2%
20:00 - 21:59	4	7.3%	8.3%
22:00 - 24:00	8	14.5%	8.3%

Street Lighting Off/Nil			% of Dark
21	of	22 in Dark	95.5%

Crashes		Casualties
4	2010	4
14	2009	9
9	2008	3
13	2007	8
11	2006	6
4	2005	3

~ School Travel Time		
Involvement	9	16.4%

McLean Periods			% Week
A	8	14.5%	17.9%
B	5	9.1%	7.1%
C	4	7.3%	17.9%
D	0	0.0%	3.5%
E	0	0.0%	3.6%
F	18	32.7%	10.7%
G	6	10.9%	7.1%
H	4	7.3%	7.1%
I	6	10.9%	12.5%
J	4	7.3%	10.7%

Day of the Week								
Monday	9	16.4%	Thursday	4	7.3%	Sunday	4	7.3%
Tuesday	12	21.8%	Friday	6	10.9%	WEEKDAY	42	76.4%
Wednesday	11	20.0%	Saturday	9	16.4%	WEEKEND	13	23.6%

# Holiday Periods								
New Year	0	0.0%	Queen's BD	0	0.0%	Easter SH	2	3.6%
Aust. Day	0	0.0%	Labour Day	2	3.6%	June/July SH	4	7.3%
Easter	1	1.8%	Christmas	0	0.0%	Sept./Oct. SH	2	3.6%
Anzac Day	0	0.0%	January SH	3	5.5%	December SH	0	0.0%

Crashid dataset George Booth Drive between F3 Freeway (exc) to John Renshaw Drive (Exc). Crash Period 01/07/05 to 30/06/10 (finalised data).

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

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region					**Lake Macquarie City LGA**	**Seahampton**			**George Booth Dr**											
638306	08/09/2008	Mon	17:20	60 m N	BLUE GUM CK	2WY	CRV	Fine	Dry	80	1	SEM	M47	S in GEORGE BOOTH DR	40	Proceeding in lane	I	0	1	S
E130111695					Dusk	DCA: 803	L	Off right bend into obj				Fence								
Hunter Region					**Lake Macquarie City LGA**	**Seahampton**			**George Booth Dr**											
558110	09/02/2007	Fri	16:10	155 m N	BLUE GUM CK	2WY	CRV	Fine	Dry	80	1	CAR	F40	S in GEORGE BOOTH DR	70	Proceeding in lane	N	0	0	S F
E57261801					Daylight	DCA: 804	R	Off left bend into obj				Fence								
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
565219	05/04/2007	Thu	16:05	at	BUCHANAN RD	TJN	STR	Fine	Dry	80	2	CAR	M74	S in BUCHANAN RD	5	Turning right	N	0	0	
E29790247					Daylight	DCA: 104		Adj - Right-thru from right				CAR	M35	E in GEORGE BOOTH DR	70	Proceeding in lane				
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
681701	07/09/2009	Mon	07:00	1.35 km E	ECHIDNA DR	2WY	CRV	Overcast	Dry	80	1	CAR	F30	W in GEORGE BOOTH DR	95	Proceeding in lane	N	0	0	S
E38296933					Daylight	DCA: 803	R	Off right bend into obj				Tree/bush								
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
702430	10/03/2010	Wed	17:10	1.35 km E	ECHIDNA DR	2WY	CRV	Raining	Wet	80	3	CAR	F50	W in GEORGE BOOTH DR	Unk	Incorrect side	I	0	2	S
E40110133					Daylight	DCA: 201		Opp - Head on				TRK	M43	E in GEORGE BOOTH DR	Unk	Proceeding in lane				
												4WD	M34	E in GEORGE BOOTH DR	Unk	Proceeding in lane				
Hunter Region					**Lake Macquarie City LGA**	**Seahampton**			**George Booth Dr**											
485535	27/07/2005	Wed	17:45	at	FIFTH ST	TJN	STR	Fine	Dry	60	2	CAR	F22	N in GEORGE BOOTH DR	30	Proceeding in lane	N	0	0	
E24193325					Darkness	DCA: 301		Same - Rear end				WAG	M19	N in GEORGE BOOTH DR	10	Proceeding in lane				
Hunter Region					**Lake Macquarie City LGA**	**Seahampton**			**George Booth Dr**											
663725	30/03/2009	Mon	17:10	at	FIFTH ST	TJN	STR	Fine	Dry	60	2	CAR	M20	N in GEORGE BOOTH DR	60	Proceeding in lane	N	0	0	
E530069090					Daylight	DCA: 303		Same - Rear right				WAG	M48	N in GEORGE BOOTH DR	2	Turning right				
Hunter Region					**Lake Macquarie City LGA**	**Seahampton**			**George Booth Dr**											
679247	11/08/2009	Tue	18:05	at	FIFTH ST	TJN	STR	Fine	Dry	60	2	CAR	F18	N in GEORGE BOOTH DR	60	Proceeding in lane	I	0	1	
E39024665					Darkness	DCA: 303		Same - Rear right				CAR	F49	N in GEORGE BOOTH DR	10	Turning right				
Hunter Region					**Lake Macquarie City LGA**	**Seahampton**			**George Booth Dr**											
696068	03/11/2009	Tue	18:25	10 m N	FIRST ST	TJN	STR	Fine	Dry	60	2	TRK	M39	E in GEORGE BOOTH DR	60	Proceeding in lane	I	0	1	
E39266740					Daylight	DCA: 703		Left off cway into object				WAG		E in GEORGE BOOTH DR	0	Parked				

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region					**Cessnock City LGA**	**Richmond Vale**			**George Booth Dr**											
501044	30/11/2005	Wed	06:38	10 km W	FIRST ST	2WY	CRV	Raining	Wet	80	2	CAR	F19	W in GEORGE BOOTH DR	70	Incorrect side	I	0	2	S
E25430236					Daylight	DCA: 201		Opp - Head on				WAG	M48	E in GEORGE BOOTH DR	70	Proceeding in lane				
Hunter Region					**Cessnock City LGA**	**Mulbring**			**Richmond Vale Rd**											
648195	10/12/2008	Wed	23:20	10 m S	GEORGE BOOTH RD	TJN	CRV	Fine	Dry	80	1	4WD	M U	W in GEORGE BOOTH RD	Unk	Turning left	N	0	0	S
E36558241					Darkness	DCA: 706	R	Left turn				Signpost								
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
586172	16/08/2007	Thu	10:30	500 m S	JOHN RENSHAW DR	2WY	STR	Raining	Wet	80	2	VAN	F76	N in GEORGE BOOTH DR	Unk	Proceeding in lane	N	0	0	
E31054547					Daylight	DCA: 301		Same - Rear end				CAR	M54	N in GEORGE BOOTH DR	0	Stationary				
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
680576	18/05/2009	Mon	18:15	830 m S	JOHN RENSHAW DR	2WY	STR	Raining	Wet	80	2	CAR	F26	S in GEORGE BOOTH DR	20	Turning right	N	0	0	
E37422061					Darkness	DCA: 308		Same - Rgt turn side swipe				CAR	F28	S in GEORGE BOOTH DR	45	Proceeding in lane				
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
535225	09/09/2006	Sat	19:15	1 km S	JOHN RENSHAW DR	2WY	STR	Raining	Wet	60	2	WAG	M36	N in GEORGE BOOTH DR	60	Incorrect side	N	0	0	F
E27765760					Darkness	DCA: 201		Opp - Head on				CAR	M46	S in GEORGE BOOTH DR	50	Proceeding in lane				
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
565661	09/02/2007	Fri	17:10	1 km S	JOHN RENSHAW DR	2WY	STR	Fine	Dry	80	2	CAR	F26	N in GEORGE BOOTH DR	60	Proceeding in lane	I	0	1	
E29889548					Daylight	DCA: 301		Same - Rear end				CAR	F34	N in GEORGE BOOTH DR	20	Proceeding in lane				
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
671299	17/05/2009	Sun	07:15	2.8 km S	JOHN RENSHAW DR	2WY	CRV	Fine	Dry	80	1	CAR	M22	S in GEORGE BOOTH DR	80	Proceeding in lane	I	0	3	S
E37752729					Daylight	DCA: 804	L	Off left bend into obj				Tree/bush								
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
538520	30/09/2006	Sat	23:30	4 km S	JOHN RENSHAW DR	DIV	STR	Fine	Dry	80	1	TRK	M60	N in GEORGE BOOTH DR	80	Proceeding in lane	N	0	0	
E28594728					Darkness	DCA: 704		Right off cway into obj				Tree/bush								
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
561852	25/03/2007	Sun	22:00	4.2 km S	JOHN RENSHAW DR	2WY	CRV	Raining	Wet	80	1	CAR	F55	N in GEORGE BOOTH DR	Unk	Proceeding in lane	I	0	1	S
E29924457					Darkness	DCA: 804	L	Off left bend into obj				Tree/bush								
Hunter Region					**Cessnock City LGA**	**Buchanan**			**George Booth Dr**											
547647	02/12/2006	Sat	23:10	5 km S	JOHN RENSHAW DR	2WY	CRV	Raining	Wet	90	1	CAR	M45	N in GEORGE BOOTH DR	80	Proceeding in lane	N	0	0	S
E30613689					Darkness	DCA: 803	R	Off right bend into obj				Tree/bush								

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
591881	03/08/2007	Fri	22:10	6 km S	JOHN RENSHAW DR	2WY	STR	Fine	Wet	80	2	CAR	M17	N in GEORGE BOOTH DR	80	Incorrect side	I	0	2	
E31264958					Darkness	DCA: 201		Opp - Head on				CAR	M19	S in GEORGE BOOTH DR	80	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
576013	26/05/2007	Sat	20:43	6.15 km S	JOHN RENSHAW DR	2WY	CRV	Fine	Dry	80	1	WAG	M52	E in GEORGE BOOTH DR	80	Proceeding in lane	I	0	1	S
E31180439					Darkness	DCA: 803	L	Off right bend into obj				Fence								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
663056	05/04/2009	Sun	03:05	7 km S	JOHN RENSHAW DR	2WY	CRV	Raining	Wet	100	1	TRK	U U	S in GEORGE BOOTH DR	80	Proceeding in lane	N	0	0	S
E37121804					Darkness	DCA: 803	L	Off right bend into obj				Embankment								
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
676160	24/07/2009	Fri	05:30	1.6 km N	MT SUGARLOAF DR	2WY	CRV	Overcast	Wet	80	2	CAR	M23	S in GEORGE BOOTH DR	75	Incorrect side	N	0	0	S
E39972089					Darkness	DCA: 201		Opp - Head on				CAR	M33	N in GEORGE BOOTH DR	80	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Cessnock**			**George Booth Dr**											
540671	16/10/2006	Mon	07:10	5.05 km W	MT SUGARLOAF R TO	DIV	CRV	Fine	Dry	80	2	TRK	U U	E in GEORGE BOOTH DR	Unk	Incorrect side	N	0	0	
E28811507					Daylight	DCA: 201		Opp - Head on				CAR	F44	W in GEORGE BOOTH DR	70	Proceeding in lane				
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
488718	13/08/2005	Sat	21:02	at	MT SUGARLOAF RD	TJN	CRV	Fine	Dry	80	1	CAR	M17	W in GEORGE BOOTH DR	75	Turning left	N	0	0	S
E24565217					Darkness	DCA: 706	L	Left turn				Fence								
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
605388	22/01/2008	Tue	23:30	200 m E	MT SUGARLOAF RD	2WY	CRV	Fine	Dry	80	1	CAR	M22	E in GEORGE BOOTH DR	75	Proceeding in lane	N	0	0	
E34330882					Darkness	DCA: 609		On path - Hit animal				Kangaroo								
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
660017	04/03/2009	Wed	15:15	700 m E	MT SUGARLOAF RD	2WY	CRV	Raining	Wet	60	1	CAR	F17	W in GEORGE BOOTH DR	80	Proceeding in lane	I	0	1	S
E36839012					Daylight	DCA: 803	L	Off right bend into obj				Tree/bush								
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
529446	10/07/2006	Mon	13:30	400 m N	MT SUGARLOAF RD	2WY	CRV	Fine	Dry	80	1	TRK	M33	S in GEORGE BOOTH DR	60	Proceeding in lane	I	0	1	S F
E27688731					Daylight	DCA: 803	L	Off right bend into obj				Fence								
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
637606	11/08/2008	Mon	16:40	500 m N	MT SUGARLOAF RD	2WY	CRV	Fine	Dry	70	2	CAR	M43	S in GEORGE BOOTH DR	70	Proceeding in lane	N	0	0	
E34922071					Daylight	DCA: 301		Same - Rear end				WAG	M25	S in GEORGE BOOTH DR	0	Stationary				

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
				Natural Lighting																**S F**
Hunter Region				**Lake Macquarie City LGA**		**West Wallsend**			**George Booth Dr**											
695274	27/02/2010	Sat	03:30	600 m N	MT SUGARLOAF RD	2WY	CRV	Fine	Dry	80	2	SEM	M68	N in GEORGE BOOTH DR	60	Proceeding in lane	F	1	0	
E39928636					Darkness	DCA: 4		Ped - On carriageway				PED	M17	GEORGE BOOTH DR		Lie/sit on carriageway				
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
619447	23/02/2008	Sat	04:00	1 km N	MT SUGARLOAF RD	2WY	STR	Fine	Dry	80	1	CAR	M31	N in GEORGE BOOTH DR	80	Proceeding in lane	N	0	0	
E33380769					Darkness	DCA: 703		Left off cway into object				Fence								
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
686825	23/10/2009	Fri	16:00	200 m W	MT SUGARLOAF RD	2WY	STR	Raining	Wet	80	1	CAR	M27	W in GEORGE BOOTH DR	70	Proceeding in lane	N	0	0	
E40585082					Daylight	DCA: 704		Right off cway into obj				Fence								
Hunter Region				**Cessnock City LGA**		**Richmond Vale**			**George Booth Dr**											
592883	22/05/2007	Tue	15:00	480 m W	MT SUGARLOAF RD	2WY	CRV	Fine	Dry	60	1	M/C	M19	W in GEORGE BOOTH DR	60	Proceeding in lane	I	0	1	S F
E30558564					Daylight	DCA: 801	L	Off cway right bend												
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
566308	24/04/2007	Tue	09:45	1 km W	MT SUGARLOAF RD	2WY	STR	Raining	Wet	70	1	UTE	M37	E in GEORGE BOOTH DR	40	Proceeding in lane	N	0	0	F
E30361319					Daylight	DCA: 703		Left off cway into object				Embankment								
Hunter Region				**Lake Macquarie City LGA**		**West Wallsend**			**George Booth Dr**											
524663	19/06/2006	Mon	18:14	1.65 km W	MT SUGARLOAF RD	2WY	CRV	Fine	Dry	80	1	CAR	M29	E in GEORGE BOOTH DR	75	Proceeding in lane	N	0	0	
E27238064					Darkness	DCA: 803	R	Off right bend into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
574977	14/12/2006	Thu	07:15	5 km W	MT SUGARLOAF RD	2WY	CRV	Overcast	Wet	80	2	CAR	M29	E in GEORGE BOOTH DR	70	Incorrect side	I	0	2	S
E29041426					Daylight	DCA: 201		Opp - Head on				CAR	F33	W in GEORGE BOOTH DR	60	Proceeding in lane				
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
489709	29/08/2005	Mon	16:15	1 km W	NEWCASTLE EXP	2WY	CRV	Fine	Dry	80	1	CAR	F22	W in GEORGE BOOTH DR	70	Proceeding in lane	I	0	1	S
E24841668					Daylight	DCA: 803	L	Off right bend into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
672884	27/06/2009	Sat	16:10	52 m S	NUMBER 1395 HN	2WY	CRV	Overcast	Dry	80	1	M/C	M37	N in GEORGE BOOTH DR	Unk	Proceeding in lane	I	0	1	S F
E37940012					Daylight	DCA: 803	L	Off right bend into obj				Fence								

Detailed Crash Report - sorted

Natural Lighting

S F

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
580257	04/07/2007	Wed	05:30	100 m N	ORICA EXPLOSIV ENT	2WY	CRV	Overcast	Wet	80	1	CAR	M17	S in GEORGE BOOTH DR	60	Proceeding in lane	N	0	0	F
E31208407					Dawn	DCA: 803	L	Off right bend into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
616114	18/03/2008	Tue	18:15	28 m N	RICHMOND VALE DR	2WY	CRV	Fine	Dry	100	1	CAR	M21	N in GEORGE BOOTH DR	70	Proceeding in lane	N	0	0	S
E32916170					Daylight	DCA: 803	L	Off right bend into obj				Signpost								
Hunter Region				**Cessnock City LGA**		**Richmond Vale**			**George Booth Dr**											
521625	17/05/2006	Wed	17:45	at	RICHMOND VALE RD	TJN	CRV	Fine	Dry	90	1	CAR	F18	N in GEORGE BOOTH DR	80	Proceeding in lane	I	0	1	S
E28665382					Dusk	DCA: 803	R	Off right bend into obj				Fence								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
716561	03/02/2010	Wed	07:12	35 m E	RICHMOND VALE RD	2WY	CRV	Raining	Wet	80	2	CAR	M38	W in GEORGE BOOTH DR	Unk	Incorrect side	I	0	1	
E39770222					Daylight	DCA: 201		Opp - Head on				CAR	M32	E in GEORGE BOOTH DR	Unk	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
586165	16/08/2007	Thu	20:03	200 m E	RICHMOND VALE RD	2WY	CRV	Fog or mist	Dry	80	1	TRK	M41	E in GEORGE BOOTH DR	80	Proceeding in lane	N	0	0	
E30845720					Darkness	DCA: 803	R	Off right bend into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
681330	05/08/2009	Wed	22:10	300 m E	RICHMOND VALE RD	2WY	STR	Fine	Dry	80	1	CAR	M U	E in GEORGE BOOTH DR	80	Proceeding in lane	I	0	1	
E37834644					Darkness	DCA: 609		On path - Hit animal				Straying stock								
Hunter Region				**Cessnock City LGA**		**Richmond Vale**			**George Booth Dr**											
621092	14/03/2008	Fri	16:10	1.4 km E	RICHMOND VALE RD	2WY	CRV	Fine	Dry	80	1	CAR	M32	W in GEORGE BOOTH DR	80	Proceeding in lane	I	0	1	S
E33913839					Daylight	DCA: 804	L	Off left bend into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
704728	30/03/2010	Tue	18:00	1.45 km E	RICHMOND VALE RD	2WY	CRV	Raining	Wet	80	1	CAR	F30	W in GEORGE BOOTH DR	70	Proceeding in lane	N	0	0	S
E40549512					Darkness	DCA: 804	L	Off left bend into obj				Embankment								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
620698	22/04/2008	Tue	22:30	2.08 km E	RICHMOND VALE RD	2WY	CRV	Raining	Wet	80	1	UTE	M19	W in GEORGE BOOTH DR	70	Proceeding in lane	N	0	0	S
E33895169					Darkness	DCA: 804	R	Off left bend into obj				Embankment								

Natural Lighting S F

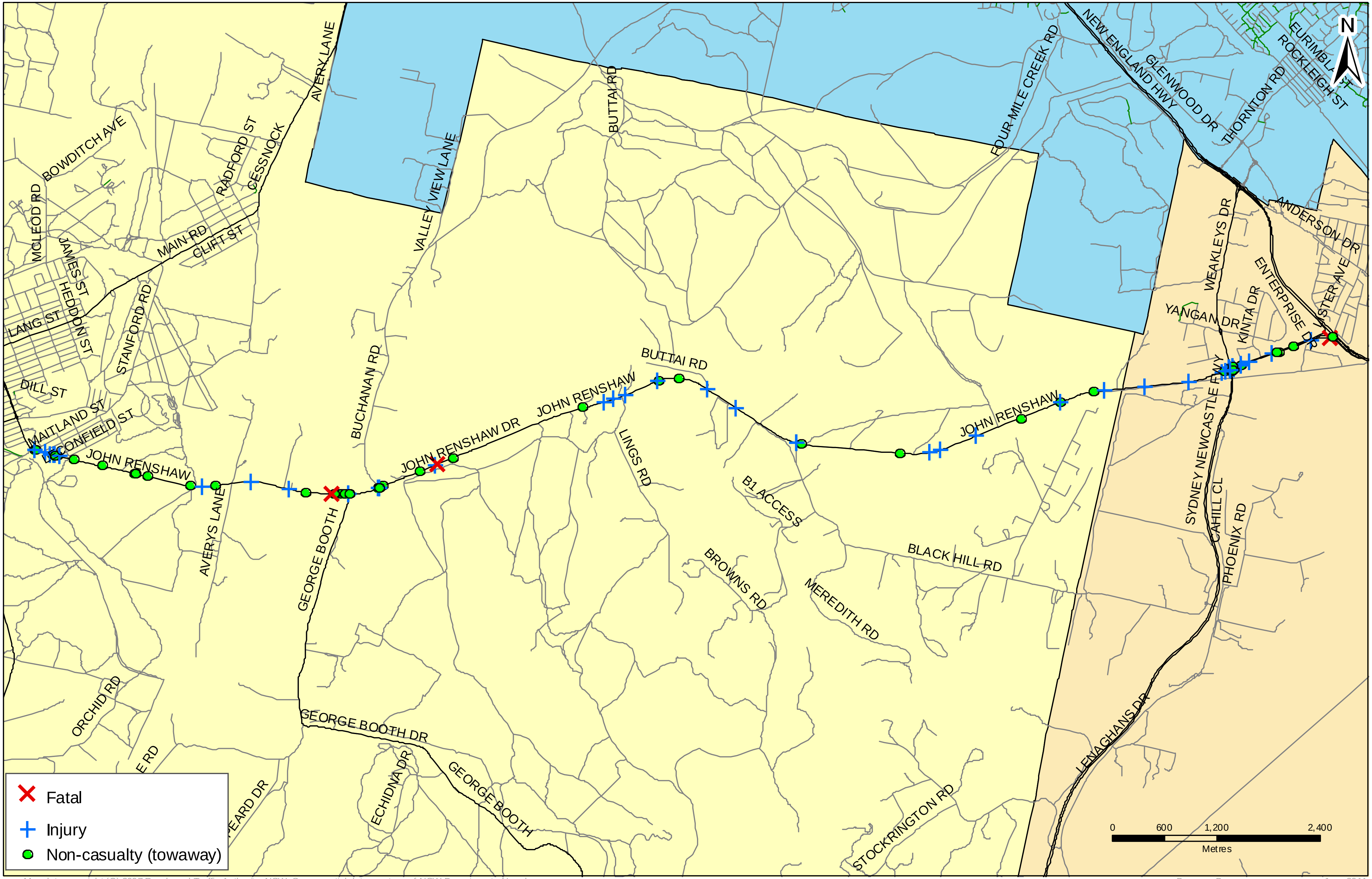
Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
581699	10/07/2007	Tue	17:15	2.12 km E	RICHMOND VALE RD	2WY	CRV	Fine	Dry	90	1	SEM	M38	E in GEORGE BOOTH DR	90	Proceeding in lane	I	0	1	S
E103323298					Dusk	DCA: 805		Out of control on bend												
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
591802	29/09/2007	Sat	16:00	3.105 km E	RICHMOND VALE RD	2WY	CRV	Fine	Dry	80	1	CAR	M19	E in GEORGE BOOTH DR	110	Pull out opposite	I	0	1	S
E31278452					Daylight	DCA: 502		Ovtak - Out of control												
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
625541	01/06/2008	Sun	07:40	540 m N	RICHMOND VALE RD	2WY	CRV	Raining	Wet	80	1	CAR	F20	S in GEORGE BOOTH DR	Unk	Proceeding in lane	I	0	1	S
E34119679					Daylight	DCA: 804	R	Off left bend into obj				Fence								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
511324	25/01/2006	Wed	13:20	600 m N	RICHMOND VALE RD	2WY	CRV	Raining	Wet	90	1	CAR	M17	N in GEORGE BOOTH DR	85	Proceeding in lane	N	0	0	S
E25834676					Daylight	DCA: 803	R	Off right bend into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
686708	20/10/2009	Tue	21:59	2 km S	RICHMOND VALE RD	2WY	CRV	Fine	Dry	80	2	M/C	M49	S in GEORGE BOOTH DR	Unk	Proceeding in lane	I	0	1	
E39212129					Darkness	DCA: 603		On path - Previous accident				WAG	F56	S in GEORGE BOOTH DR	0	Broken down				
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
690830	01/12/2009	Tue	08:20	at	SEAHAMPTON RD	TJN	CRV	Overcast	Dry	60	2	BOX		E in GEORGE BOOTH DR		Incorrect side	N	0	0	
E38961352					Daylight	DCA: 201		Opp - Head on				4WD	M55	W in GEORGE BOOTH DR	60	Proceeding in lane				
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
507659	17/01/2006	Tue	15:13	50 m W	SEAHAMPTON RD	2WY	CRV	Raining	Wet	60	1	CAR	F21	W in GEORGE BOOTH DR	60	Proceeding in lane	I	0	1	S
E25763376					Daylight	DCA: 804	L	Off left bend into obj				Tree/bush								
Hunter Region				**Lake Macquarie City LGA**		**Seahampton**			**George Booth Dr**											
527211	31/05/2006	Wed	16:30	at	TASMAN MINE ENT	DIV	STR	Fine	Dry	80	1	M/C	M64	E in GEORGE BOOTH DR	80	Proceeding in lane	I	0	1	F
E27248538					Dusk	DCA: 705		Out of control on cway												

Report Totals: Total Crashes: 55 Fatal Crashes: 1 Injury Crashes: 26 Killed: 1 Injured: 32

Crashid dataset George Booth Drive between F3 Freeway (exc) to John Renshaw Drive (Exc). Crash Period 01/07/05 to 30/06/10 (finalised data).

John Renshaw Drive between New England Highway at Beresfield (exc) to Maitland St at Kurri Kurri (Inc)

Crashes period 1/7/2005 to 30/06/10 (Finalised Data)



Bronwyn Bosse

June 2011

Summary Crash Report

# Crash Type		
Car Crash	122	93.1%
Light Truck Crash	19	14.5%
Rigid Truck Crash	0	0.0%
Articulated Truck Crash	10	7.6%
'Heavy Truck Crash	(10)	(7.6%)
Bus Crash	1	0.8%
"Heavy Vehicle Crash	(11)	(8.4%)
Emergency Vehicle Crash	1	0.8%
Motorcycle Crash	14	10.7%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	1	0.8%

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

Location Type		
*Intersection	66	50.4%
Non intersection	65	49.6%

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

Collision Type		
Single Vehicle	26	19.8%
Multi Vehicle	105	80.2%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	131	100.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	16	12.2%
Fatigue	9	6.9%

Weather		
Fine	101	77.1%
Rain	17	13.0%
Overcast	11	8.4%
Fog or mist	2	1.5%
Other	0	0.0%

Road Surface Condition		
Wet	25	19.1%
Dry	106	80.9%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	1	0.8%
Daylight	102	77.9%
Dusk	5	3.8%
Darkness	23	17.6%

Crash Movement		
Intersection, adjacent approaches	21	16.0%
Head-on (not overtaking)	9	6.9%
Opposing vehicles; turning	3	2.3%
U-turn	5	3.8%
Rear-end	42	32.1%
Lane change	3	2.3%
Parallel lanes; turning	10	7.6%
Vehicle leaving driveway	3	2.3%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	2	1.5%
Off road, on straight	0	0.0%
Off road on straight, hit object	9	6.9%
Out of control on straight	2	1.5%
Off road, on curve	0	0.0%
Off road on curve, hit object	7	5.3%
Out of control on curve	1	0.8%
Other crash type	14	10.7%

Speed Limit					
			~ 40km/h or less	0	0.0%
40 km/h or less	2	1.5%	80 km/h zone	29	22.1%
50 km/h zone	3	2.3%	90 km/h zone	13	9.9%
60 km/h zone	64	48.9%	100 km/h zone	15	11.5%
70 km/h zone	5	3.8%	110 km/h zone	0	0.0%

CRASHES	131	
Fatal crash	3	2.3%
Injury crash	62	47.3%
Non-casualty crash	66	50.4%

CASUALTIES	86	
Killed	3	3.5%
Injured	83	96.5%
^ Unrestrained	1	1.2%

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

Time Group			% of Day
00:01 - 02:59	5	3.8%	12.5%
03:00 - 04:59	3	2.3%	8.3%
05:00 - 05:59	2	1.5%	4.2%
06:00 - 06:59	5	3.8%	4.2%
07:00 - 07:59	10	7.6%	4.2%
08:00 - 08:59	5	3.8%	4.2%
09:00 - 09:59	10	7.6%	4.2%
10:00 - 10:59	9	6.9%	4.2%
11:00 - 11:59	7	5.3%	4.2%
12:00 - 12:59	9	6.9%	4.2%
13:00 - 13:59	7	5.3%	4.2%
14:00 - 14:59	9	6.9%	4.2%
15:00 - 15:59	11	8.4%	4.2%
16:00 - 16:59	12	9.2%	4.2%
17:00 - 17:59	13	9.9%	4.2%
18:00 - 18:59	2	1.5%	4.2%
19:00 - 19:59	2	1.5%	4.2%
20:00 - 21:59	8	6.1%	8.3%
22:00 - 24:00	2	1.5%	8.3%

Street Lighting Off/Nil			% of Dark
10	of	23 in Dark	43.5%

Crashes		Casualties
11	2010	8
25	2009	15
28	2008	15
25	2007	14
24	2006	16
18	2005	18

~ School Travel Time		
Involvement	41	31.3%

McLean Periods			% Week
A	22	16.8%	17.9%
B	3	2.3%	7.1%
C	34	26.0%	17.9%
D	9	6.9%	3.5%
E	8	6.1%	3.6%
F	22	16.8%	10.7%
G	14	10.7%	7.1%
H	9	6.9%	7.1%
I	3	2.3%	12.5%
J	7	5.3%	10.7%

Day of the Week								
Monday	22	16.8%	Thursday	17	13.0%	Sunday	13	9.9%
Tuesday	19	14.5%	Friday	25	19.1%	WEEKDAY	101	77.1%
Wednesday	18	13.7%	Saturday	17	13.0%	WEEKEND	30	22.9%

# Holiday Periods								
New Year	0	0.0%	Queen's BD	1	0.8%	Easter SH	1	0.8%
Aust. Day	2	1.5%	Labour Day	1	0.8%	June/July SH	4	3.1%
Easter	1	0.8%	Christmas	0	0.0%	Sept./Oct. SH	4	3.1%
Anzac Day	0	0.0%	January SH	6	4.6%	December SH	5	3.8%

Crashid dataset John Renshaw Drive between New England Hwy at Beresfield (exc) to Maitland St, Kurri Kurri (Inc). Crash Period 01/07/05 to 30/06/10 (finalised data).

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

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
485633	09/07/2005	Sat	12:00	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	CAR	M46	W in JOHN RENSHAW DR	Unk	Proceeding in lane	N	0	0	
E24587019					Daylight	DCA: 101		Adj - Cross traffic				4WD	M27	S in NEWCASTLE EXP	30	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
489311	15/07/2005	Fri	14:38	1 km E	WALLSEND ST	2WY	STR	Fine	Dry	60	3	CAR	M48	S in JOHN RENSHAW DR	50	Proceeding in lane	N	0	0	
E24412746						DCA: 301		Same - Rear end				CAR	M18	S in JOHN RENSHAW DR	0	Stationary				
												CAR	F33	S in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**Tarro St**											
490174	30/07/2005	Sat	14:30	at	MAITLAND ST	TJN	STR	Fine	Dry	60	2	CAR	M54	W in TARRO ST	40	Veering left	N	0	0	
E24315415					Daylight	DCA: 303		Same - Rear right				TRK	M45	W in TARRO ST	0	Wait turn right				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
486170	01/08/2005	Mon	14:15	at	NEWCASTLE EXP	RDB	CRV	Fine	Dry	60	2	OMV	M45	E in JOHN RENSHAW DR	30	Proceeding in lane	I	0	1	
E24442514					Daylight	DCA: 101		Adj - Cross traffic				CAR	M64	N in NEWCASTLE EXP	30	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
488200	18/08/2005	Thu	08:30	at	MAITLAND ST	TJN	STR	Fine	Dry	60	2	TRK	M21	W in JOHN RENSHAW DR	50	Proceeding in lane	N	0	0	
E24363875					Daylight	DCA: 301		Same - Rear end				CAR	F45	W in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Newcastle City LGA**		**Leneghans Flat**			**John Renshaw Dr**											
488821	19/08/2005	Fri	13:28	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	SEM	M33	N in NEWCASTLE EXP	20	Incorrect side	I	0	1	F
E24542172					Daylight	DCA: 201		Opp - Head on				4WD	F32	S in NEWCASTLE EXP	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
482963	10/09/2005	Sat	19:45	5 m S	JOHN RENSHAW DR	TJN	STR	Fine	Dry	80	2	4WD	F32	N in GEORGE BOOTH DR	10	Proceeding in lane	I	0	1	
E24947045					Darkness	DCA: 301		Same - Rear end				CAR	M44	N in GEORGE BOOTH DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
492381	23/09/2005	Fri	05:45	75 m E	WALLSEND ST	2WY	STR	Fine	Dry	60	2	TRK	M22	E in JOHN RENSHAW DR	15	Forward from drive	N	0	0	
E25357863					Dawn	DCA: 406		Manov - Emerging from drivewa				CAR	M25	W in JOHN RENSHAW DR	20	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
504593	12/10/2005	Wed	08:00	5 m S	JOHN RENSHAW DR	TJN	STR	Overcast	Dry	70	2	CAR	M20	N in GEORGE BOOTH DR	10	Proceeding in lane	I	0	1	
E102207494					Daylight	DCA: 302		Same - Rear left				CAR	F30	N in GEORGE BOOTH DR	0	Waiting turn left				

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Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
495466	16/10/2005	Sun	09:45	3 km E	MAITLAND ST	2WY	STR	Raining	Wet	80	1	CAR	F21	W in JOHN RENSHAW DR	80	Proceeding in lane	I	0	1	
E25503474					Daylight	DCA: 705		Out of control on cway												
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
494344	19/10/2005	Wed	14:45	5 m S	JOHN RENSHAW DR	TJN	STR	Fine	Dry	70	2	CAR	F26	N in GEORGE BOOTH DR	10	Proceeding in lane	I	0	1	
E49128501					Daylight	DCA: 302		Same - Rear left				CAR	M59	N in GEORGE BOOTH DR	0	Waiting turn left				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
495496	20/10/2005	Thu	17:15	3 km W	NEWCASTLE EXP	2WY	STR	Raining	Wet	90	2	CAR	M51	W in JOHN RENSHAW DR	90	Pull out opposite	I	0	2	
E25397958					Dusk	DCA: 505		Ovtak - Pulling out rear end				SEM	M U	W in JOHN RENSHAW DR	90	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
495672	30/10/2005	Sun	11:00	100 m E	NEWCASTLE EXP	DIV	STR	Raining	Wet	80	1	TRK	M74	W in JOHN RENSHAW DR	65	Proceeding in lane	I	0	1	
E26037741					Daylight	DCA: 703		Left off cway into object				Utility pole								
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
495655	30/10/2005	Sun	11:13	100 m E	NEWCASTLE EXP	DIV	STR	Raining	Wet	80	2	4WD	M35	E in JOHN RENSHAW DR	50	Proceeding in lane	I	0	4	
E25141947					Daylight	DCA: 301		Same - Rear end				OMV	M40	E in JOHN RENSHAW DR	15	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buttai**			**John Renshaw Dr**											
501710	23/11/2005	Wed	14:40	50 m E	BUTTAI RD	2WY	STR	Fine	Dry	90	1	CAR	M29	W in JOHN RENSHAW DR	90	Proceeding in lane	I	0	1	
E25606457					Daylight	DCA: 703		Left off cway into object				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
500551	14/12/2005	Wed	16:45	at	GEORGE BOOTH DR	TJN	STR	Fine	Dry	90	4	CAR	F23	E in JOHN RENSHAW DR	Unk	Proceeding in lane	I	0	3	
E25543517					Daylight	DCA: 302		Same - Rear left				4WD	F54	S in GEORGE BOOTH DR	0	Wait turn right				
												CAR	F54	E in JOHN RENSHAW DR	0	Waiting turn left				
												CAR	F31	W in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
500028	14/12/2005	Wed	17:00	5 m S	JOHN RENSHAW DR	TJN	STR	Fine	Dry	80	2	UTE	F47	N in GEORGE BOOTH DR	10	Proceeding in lane	N	0	0	
E25714421					Daylight	DCA: 303		Same - Rear right				4WD	M18	N in GEORGE BOOTH DR	0	Wait turn right				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
501420	22/12/2005	Thu	13:30	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	M/C	M22	W in JOHN RENSHAW DR	50	Proceeding in lane	I	0	1	
E27060555					Daylight	DCA: 101		Adj - Cross traffic				CAR	M20	N in NEWCASTLE EXP	40	Proceeding in lane				

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					Natural Lighting															**S F**
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
505700	09/01/2006	Mon	12:15	at	GEORGE BOOTH DR	TJN	STR	Fine	Dry	60	2	4WD	F35	N in JOHN RENSHAW DR	5	Proceeding in lane	I	0	1	
E26251728					Daylight	DCA: 301		Same - Rear end				CAR	F52	N in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
506700	18/01/2006	Wed	07:45	5 m S	JOHN RENSHAW DR	TJN	STR	Fine	Dry	80	2	CAR	F25	N in GEORGE BOOTH DR	5	Proceeding in lane	I	0	1	
E26687841					Daylight	DCA: 301		Same - Rear end				CAR	M38	N in GEORGE BOOTH DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
509170	08/02/2006	Wed	09:00	at	BUCHANAN RD	TJN	STR	Fine	Dry	90	2	CAR	F18	E in BUCHANAN RD	20	Turning right	N	0	0	
E26041717					Daylight	DCA: 104		Adj - Right-thru from right				CAR	F48	N in JOHN RENSHAW DR	90	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**George Booth Dr**											
516234	27/02/2006	Mon	17:00	5 m S	JOHN RENSHAW DR	TJN	STR	Fine	Dry	60	2	UTE	M U	N in GEORGE BOOTH DR	20	Proceeding in lane	I	0	1	
E27161877					Daylight	DCA: 301		Same - Rear end				CAR	F33	N in GEORGE BOOTH DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
513478	21/03/2006	Tue	10:30	at	BLACK HILL RD	TJN	CRV	Overcast	Wet	100	1	4WD	F17	W in JOHN RENSHAW DR	80	Proceeding in lane	I	0	1	F
E26558813					Daylight	DCA: 803	R	Off right bend into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
524843	05/05/2006	Fri	22:00	100 m E	WALLSEND ST	2WY	STR	Fine	Dry	60	3	CAR	M17	W in JOHN RENSHAW DR	Unk	Cutting back	I	0	3	S
E28666285					Darkness	DCA: 504		Ovtak - Cutting in				CAR	M17	W in JOHN RENSHAW DR	100	Proceeding in lane				
												CAR	M23	E in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
521085	19/05/2006	Fri	17:00	800 m W	NEW ENGLAND HWY	2WY	STR	Fine	Dry	80	2	4WD	M79	E in JOHN RENSHAW DR	Unk	Other forward	N	0	0	
E27291019					Daylight	DCA: 300		Same - other				4WD	M60	E in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
522045	29/05/2006	Mon	20:00	2 km W	NEW ENGLAND HWY	2WY	STR	Fine	Dry	80	1	CAR	M19	E in JOHN RENSHAW DR	75	Proceeding in lane	N	0	0	
E26875924					Darkness	DCA: 609		On path - Hit animal				Kangaroo								
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
527992	02/06/2006	Fri	21:30	150 m W	NEW ENGLAND HWY	OTH	CRV	Raining	Wet	80	1	CAR	M24	W in JOHN RENSHAW DR	80	Proceeding in lane	F	1	0	S
E28444855					Darkness	DCA: 804	L	Off left bend into obj				Utility pole								

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Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
527857	05/06/2006	Mon	06:50	at	NEWCASTLE EXP	RDB	STR	Raining	Wet	60	2	SEM	M48	N in JOHN RENSHAW DR	10	Turning right	N	0	0	
E27319371				Daylight		DCA: 308		Same - Rgt turn side swipe				TRK	M55	N in JOHN RENSHAW DR	10	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
526813	10/06/2006	Sat	07:15	400 m W	NEW ENGLAND HWY	DIV	CRV	Fog or mist	Wet	80	1	CAR	F25	W in JOHN RENSHAW DR	80	Proceeding in lane	I	0	1	S
E27388506				Daylight		DCA: 805		Out of control on bend												
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
524388	13/06/2006	Tue	00:35	at	WEAKLEYS DR	RDB	STR	Fine	Dry	60	2	WAG	M36	S in WEAKLEYS DR	60	Proceeding in lane	I	0	2	
E27293421				Darkness		DCA: 101		Adj - Cross traffic				TRK	M37	E in JOHN RENSHAW DR	50	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
524684	19/06/2006	Mon	16:20	at	GEORGE BOOTH DR	TJN	STR	Fine	Dry	60	3	CAR	M75	N in GEORGE BOOTH DR	10	Turning left	N	0	0	
E29186484				Daylight		DCA: 107		Adj - Left-thru from right				CAR	M U	E in JOHN RENSHAW DR	20	Proceeding in lane				
												UTE	M18	W in JOHN RENSHAW DR	50	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
525486	24/06/2006	Sat	12:07	500 m W	NEW ENGLAND HWY	DIV	STR	Fine	Dry	80	2	4WD	F60	E in JOHN RENSHAW DR	10	Perform U-turn	N	0	0	
E27172276				Daylight		DCA: 304		Same - U-turn				CAR	M27	E in JOHN RENSHAW DR	80	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
533864	15/07/2006	Sat	19:00	at	NEWCASTLE EXP	RDB	STR	Overcast	Wet	80	2	CAR	M62	N in NEWCASTLE EXP	50	Proceeding in lane	N	0	0	
E27912429				Darkness		DCA: 101		Adj - Cross traffic				CAR	F34	W in JOHN RENSHAW DR	40	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
531763	01/08/2006	Tue	09:19	1 km E	WALLSEND ST	DIV	STR	Fine	Dry	90	1	CAR	M37	W in JOHN RENSHAW DR	90	Proceeding in lane	N	0	0	
E27780257				Daylight		DCA: 703		Left off cway into object				Embankment								
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
535870	10/09/2006	Sun	16:50	1.6 km W	NEW ENGLAND HWY	2WY	CRV	Raining	Wet	80	1	CAR	M35	E in JOHN RENSHAW DR	80	Proceeding in lane	N	0	0	S
E28359504				Dusk		DCA: 803	L	Off right bend into obj				Fence								
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
536196	19/09/2006	Tue	15:20	33 m E	WALLSEND ST	2WY	STR	Fine	Dry	60	2	M/C	M28	W in JOHN RENSHAW DR	80	Proceeding in lane	I	0	1	S
E28403769				Daylight		DCA: 301		Same - Rear end				CAR	M47	W in JOHN RENSHAW DR	10	Proceeding in lane				

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					Natural Lighting															**S F**
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
538563	02/10/2006	Mon	01:30	20 m W	GEORGE BOOTH DR	2WY	STR	Fine	Dry	60	1	CAR	M21	W in JOHN RENSHAW DR	50	Proceeding in lane	N	0	0	
E28057659					Darkness	DCA: 607		On path - Hit temp object				Other non fixed object								
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
540486	10/10/2006	Tue	07:30	1.2 km E	BLACK HILL RD	2WY	STR	Fine	Dry	100	3	LTR		E in JOHN RENSHAW DR		Incorrect side	N	0	0	
E28604650					Daylight	DCA: 201		Opp - Head on				4WD	M49	E in JOHN RENSHAW DR	95	Proceeding in lane				
												CAR	F50	W in JOHN RENSHAW DR	80	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buttai**			**John Renshaw Dr**											
561921	23/11/2006	Thu	03:15	200 m W	LINGS RD	2WY	STR	Fine	Dry	100	2	4WD	F48	W in JOHN RENSHAW DR	Unk	Incorrect side	I	0	2	F
E28563947					Darkness	DCA: 201		Opp - Head on				CAR	M33	E in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
553502	03/12/2006	Sun	11:20	at	BUCHANAN RD	TJN	STR	Overcast	Dry	60	2	CAR	F17	S in BUCHANAN RD	15	Proceeding in lane	I	0	2	
E108246195					Daylight	DCA: 101		Adj - Cross traffic				CAR	F62	E in JOHN RENSHAW DR	45	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
549680	03/12/2006	Sun	11:50	60 m E	BUCHANAN RD	2WY	STR	Overcast	Dry	80	2	CAR	F18	N in JOHN RENSHAW DR	20	Proceeding in lane	N	0	0	
E29544739					Daylight	DCA: 301		Same - Rear end				CAR	M U	N in JOHN RENSHAW DR	20	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
549062	08/12/2006	Fri	17:00	500 m W	AVERYS LANE	2WY	STR	Fine	Dry	90	1	CAR	F27	W in JOHN RENSHAW DR	80	Proceeding in lane	N	0	0	F
E28997026					Daylight	DCA: 704		Right off cway into obj				Tree/bush								
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
590159	09/01/2007	Tue	14:20	at	NEWCASTLE EXP	RDB	CRV	Fine	Wet	60	2	WAG	F75	N in NEWCASTLE EXP	30	Turning right	N	0	0	
E169956092					Daylight	DCA: 308		Same - Rgt turn side swipe				WAG	F28	N in NEWCASTLE EXP	30	Turning right				
Hunter Region				**Cessnock City LGA**		**Buttai**			**John Renshaw Dr**											
554051	26/01/2007	Fri	17:00	100 m W	LINGS RD	2WY	STR	Fine	Dry	100	1	M/C	M34	W in JOHN RENSHAW DR	100	Proceeding in lane	I	0	1	
E29192056					Daylight	DCA: 901		Fell in/from vehicle												
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
560792	31/01/2007	Wed	12:00	at	BUCHANAN RD	TJN	STR	Fine	Dry	80	2	CAR	M24	S in BUCHANAN RD	5	Turning right	N	0	0	
E29056360					Daylight	DCA: 104		Adj - Right-thru from right				TRK	F22	E in JOHN RENSHAW DR	80	Proceeding in lane				

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Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
557605	09/02/2007	Fri	10:09	100 m E	KINTA DR	DIV	STR	Fine	Dry	80	2	CAR	M78	E in JOHN RENSHAW DR	Unk	Perform U-turn	I	0	2	
E30460316					Daylight	DCA: 304		Same - U-turn				CAR	F79	E in JOHN RENSHAW DR	70	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
558243	22/02/2007	Thu	10:05	60 m W	NEWCASTLE EXP	2WY	STR	Fine	Dry	60	2	CAR	M25	E in JOHN RENSHAW DR	Unk	Turning right	N	0	0	
E29254570					Daylight	DCA: 202		Opp - Right-thru				CAR	F24	W in JOHN RENSHAW DR	60	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
588865	25/03/2007	Sun	18:45	200 m E	NEW ENGLAND HWY	DIV	STR	Raining	Wet	80	2	WAG	M54	N in JOHN RENSHAW DR	30	Perform U-turn	I	0	1	
E30934008					Darkness	DCA: 304		Same - U-turn				CAR	F22	N in JOHN RENSHAW DR	60	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
565226	05/04/2007	Thu	16:30	at	MAITLAND ST	TJN	STR	Raining	Wet	50	2	TRK	M31	W in JOHN RENSHAW DR	25	Proceeding in lane	I	0	1	
E431866090					Daylight	DCA: 303		Same - Rear right				CAR	F48	W in JOHN RENSHAW DR	0	Wait turn right				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
567765	03/05/2007	Thu	16:20	50 m E	WALLSEND ST	2WY	STR	Fine	Dry	60	2	CAR	U U	S in JOHN RENSHAW DR	Unk	Forward from drive	I	0	1	
E30082414					Daylight	DCA: 406		Manov - Emerging from drivewa				CAR	F23	W in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
571952	07/05/2007	Mon	17:45	at	NEW ENGLAND HWY	RDB	STR	Fine	Dry	80	2	CAR	F59	S in JOHN RENSHAW DR	Unk	Proceeding in lane	N	0	0	
E30084833					Darkness	DCA: 101		Adj - Cross traffic				CAR	F18	E in NEW ENGLAND HWY	Unk	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
574334	14/05/2007	Mon	15:50	at	NEWCASTLE EXP	RDB	CRV	Fine	Dry	60	2	CAR	U U	N in NEWCASTLE EXP	10	Proceeding in lane	I	0	1	
E436204890					Daylight	DCA: 101		Adj - Cross traffic				CAR	F20	W in JOHN RENSHAW DR	15	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
575368	19/05/2007	Sat	12:35	at	NEWCASTLE EXP	RDB	CRV	Fine	Dry	50	2	M/C	M49	N in JOHN RENSHAW DR	15	Turning right	I	0	1	
E30455857					Daylight	DCA: 308		Same - Rgt turn side swipe				CAR	F23	N in JOHN RENSHAW DR	10	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
576620	28/05/2007	Mon	07:45	100 m W	GEORGE BOOTH DR	2WY	STR	Fine	Dry	60	4	CAR	F22	E in JOHN RENSHAW DR	60	Proceeding in lane	N	0	0	
E30308322					Daylight	DCA: 301		Same - Rear end				CAR	F25	E in JOHN RENSHAW DR	60	Proceeding in lane				
												CAR	F23	E in JOHN RENSHAW DR	60	Proceeding in lane				
												CAR	F21	E in JOHN RENSHAW DR	60	Proceeding in lane				

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region				**Cessnock City LGA**		**Buttai**			**John Renshaw Dr**											
585156	29/05/2007	Tue	06:45	50 m E	BUTTAI CK	2WY	STR	Fog or mist	Dry	90	3	SEM	M45	W in JOHN RENSHAW DR	90	Proceeding in lane	N	0	0	
E30437611					Daylight	DCA: 301		Same - Rear end				CAR	M49	W in JOHN RENSHAW DR	30	Proceeding in lane				
												CAR	M44	W in JOHN RENSHAW DR	30	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
578097	19/06/2007	Tue	07:45	50 m W	GEORGE BOOTH DR	2WY	STR	Raining	Wet	60	2	CAR	M19	E in JOHN RENSHAW DR	60	Proceeding in lane	N	0	0	
E30802405					Daylight	DCA: 301		Same - Rear end				CAR	M29	E in JOHN RENSHAW DR	10	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
589491	17/08/2007	Fri	15:15	at	GEORGE BOOTH DR	RDB	STR	Fine	Dry	80	2	TRK	U U	E in JOHN RENSHAW DR	Unk	Other forward	I	0	1	
E33436981					Daylight	DCA: 300		Same - other				M/C	M45	E in JOHN RENSHAW DR	80	Turning right				
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
591916	31/08/2007	Fri	00:20	at	NEWCASTLE EXP	RDB	CRV	Fine	Dry	60	2	CAR	U U	N in NEWCASTLE EXP	50	Proceeding in lane	I	0	1	
E30946030					Darkness	DCA: 305		Same - Lane side swipe				4WD	M51	N in NEWCASTLE EXP	30	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
593755	31/08/2007	Fri	15:50	60 m W	NEWCASTLE EXP	2WY	STR	Fine	Dry	60	2	4WD	M63	N in JOHN RENSHAW DR	5	Forward from drive	I	0	1	
E31176772					Daylight	DCA: 406		Manov - Emerging from drivewa				WAG	M54	W in JOHN RENSHAW DR	55	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
597948	03/09/2007	Mon	13:45	at	WEAKLEYS DR	RDB	CRV	Fine	Dry	60	2	CAR	U U	E in JOHN RENSHAW DR	Unk	Proceeding in lane	I	0	1	
E31355770					Daylight	DCA: 303		Same - Rear right				TRK	M40	E in JOHN RENSHAW DR	Unk	Turning right				
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
591325	24/09/2007	Mon	09:25	at	NEWCASTLE EXP	RDB	CRV	Fine	Dry	60	2	CCH	M67	N in NEWCASTLE EXP	30	Turning right	I	0	1	
E33267185					Daylight	DCA: 308		Same - Rgt turn side swipe				WAG	F38	N in NEWCASTLE EXP	30	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
592748	27/09/2007	Thu	09:05	600 m E	WALLSEND ST	2WY	STR	Fine	Dry	90	2	CAR	F32	E in JOHN RENSHAW DR	15	Perform U-turn	N	0	0	
E33204887					Daylight	DCA: 304		Same - U-turn				CAR	F21	E in JOHN RENSHAW DR	50	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
594237	13/10/2007	Sat	09:30	at	BUCHANAN RD	TJN	STR	Fine	Dry	60	2	CAR	F19	S in BUCHANAN RD	Unk	Proceeding in lane	N	0	0	
E33837383					Daylight	DCA: 101		Adj - Cross traffic				UTE	M34	E in JOHN RENSHAW DR	Unk	Proceeding in lane				

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
601213	24/11/2007	Sat	06:25	at	NEWCASTLE EXP	RDB	CRV	Overcast	Dry	60	1	CAR	M17	S in NEWCASTLE EXP	40	Proceeding in lane	N	0	0	S
E32892065					Daylight	DCA: 803	L	Off right bend into obj				Utility pole								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
601616	01/12/2007	Sat	10:20	1.2 km W	BLACK HILL RD	2WY	STR	Overcast	Wet	100	2	4WD	F43	E in JOHN RENSHAW DR	100	Incorrect side	I	0	1	F
E32000432					Daylight	DCA: 201		Opp - Head on				4WD	F46	W in JOHN RENSHAW DR	100	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
601915	17/12/2007	Mon	20:56	at	NEWCASTLE EXP	RDB	CRV	Fine	Dry	60	2	SEM	U U	N in JOHN RENSHAW DR	50	Turning right	N	0	0	
E32149433					Darkness	DCA: 308		Same - Rgt turn side swipe				CAR	M44	N in JOHN RENSHAW DR	60	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Black Hill**			**Newcastle Exp**											
602762	22/12/2007	Sat	11:30	10 m S	JOHN RENSHAW DR	RDB	STR	Raining	Wet	80	2	CAR	M23	N in NEWCASTLE EXP	40	Proceeding in lane	N	0	0	
E32066435					Daylight	DCA: 301		Same - Rear end				OMV	M58	N in NEWCASTLE EXP	Unk	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
606797	21/01/2008	Mon	15:40	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	CAR	M73	N in NEWCASTLE EXP	80	Incorrect side	N	0	0	S
E33450453					Daylight	DCA: 201		Opp - Head on				CAR	F39	S in NEWCASTLE EXP	20	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
606173	25/01/2008	Fri	21:00	200 m E	AVERYS LANE	2WY	STR	Overcast	Wet	100	3	CAR	M18	W in JOHN RENSHAW DR	80	Proceeding in lane	I	0	1	
E63569301					Darkness	DCA: 301		Same - Rear end				CAR	M20	W in JOHN RENSHAW DR	90	Proceeding in lane				
												CAR	F21	W in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
607658	03/02/2008	Sun	10:50	3.5 km W	NEW ENGLAND HWY	2WY	CRV	Raining	Wet	100	3	CAR	F19	W in JOHN RENSHAW DR	Unk	Incorrect side	I	0	3	
E33114069					Daylight	DCA: 201		Opp - Head on				TRK	M29	E in JOHN RENSHAW DR	Unk	Proceeding in lane				
												TRK	M56	E in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
614529	27/02/2008	Wed	20:15	500 m W	GEORGE BOOTH DR	2WY	CRV	Fine	Dry	90	2	WAG	M26	W in JOHN RENSHAW DR	30	Perform U-turn	N	0	0	
E32832136					Darkness	DCA: 304		Same - U-turn				CAR	F U	W in JOHN RENSHAW DR	80	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
616518	13/03/2008	Thu	17:25	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	CAR	M48	N in NEWCASTLE EXP	20	Proceeding in lane	I	0	1	
E32869509					Daylight	DCA: 101		Adj - Cross traffic				M/C	M35	W in JOHN RENSHAW DR	20	Proceeding in lane				

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
				Natural Lighting																**S F**
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
621444	14/03/2008	Fri	10:11	at	BUCHANAN RD	TJN	STR	Fine	Dry	60	2	CAR	F48	S in BUCHANAN RD	20	Proceeding in lane	I	0	3	
E33598363					Daylight	DCA: 101		Adj - Cross traffic				WAG	M62	E in JOHN RENSHAW DR	60	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
616106	17/03/2008	Mon	08:15	500 m W	NEW ENGLAND HWY	2WY	STR	Fine	Dry	60	2	M/C	M24	E in JOHN RENSHAW DR	40	Proceeding in lane	I	0	1	
E63587702					Daylight	DCA: 301		Same - Rear end				CAR	M23	E in JOHN RENSHAW DR	20	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Kurri Kurri**			**Tarro St**											
619732	01/04/2008	Tue	16:55	60 m W	WALLSEN ST	2WY	STR	Fine	Dry	60	1	WAG	M39	W in TARRO ST	60	Proceeding in lane	I	0	1	F
E33047035					Daylight	DCA: 704		Right off cway into obj				Tree/bush								
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
618531	02/04/2008	Wed	09:32	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	SEM	M46	W in JOHN RENSHAW DR	15	Turning right	N	0	0	
E34163665					Daylight	DCA: 308		Same - Rgt turn side swipe				CAR	M37	W in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
618524	02/04/2008	Wed	16:40	800 m W	BLACK HILL RD	2WY	STR	Fine	Dry	100	2	TRK	M19	E in JOHN RENSHAW DR	90	Proceeding in lane	I	0	2	
E33567268					Daylight	DCA: 301		Same - Rear end				TRK	M27	E in JOHN RENSHAW DR	90	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
623414	10/04/2008	Thu	16:00	at	NEW ENGLAND HWY	RDB	STR	Fine	Dry	60	2	CAR	M21	W in JOHN RENSHAW DR	60	Proceeding in lane	N	0	0	
E33141209					Daylight	DCA: 305		Same - Lane side swipe				4WD	U U	W in JOHN RENSHAW DR	50	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
621995	28/04/2008	Mon	07:10	at	BUCHANAN RD	TJN	STR	Fine	Dry	100	2	CAR	F49	S in BUCHANAN RD	5	Turning right	N	0	0	
E35582784					Daylight	DCA: 104		Adj - Right-thru from right				CAR	M49	E in JOHN RENSHAW DR	70	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
624193	02/05/2008	Fri	12:20	6.7 km W	NEWCASTLE EXP	2WY	CRV	Fine	Dry	80	2	CAR	M18	W in JOHN RENSHAW DR	Unk	Proceeding in lane	N	0	0	
E33345735					Daylight	DCA: 301		Same - Rear end				CAR	M19	W in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
625884	13/05/2008	Tue	15:55	20 m E	WALLSEND ST	2WY	STR	Fine	Dry	60	2	TRK	M31	E in JOHN RENSHAW DR	Unk	Proceeding in lane	N	0	0	
E36024981					Daylight	DCA: 301		Same - Rear end				TRK	M22	E in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
629858	24/06/2008	Tue	08:00	100 m W	NEWCASTLE EXP	2WY	STR	Fine	Dry	80	2	TRK	M25	E in JOHN RENSHAW DR	10	Proceeding in lane	I	0	1	
E34606079					Daylight	DCA: 301		Same - Rear end				CAR	F19	E in JOHN RENSHAW DR	0	Stationary				

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
634454	15/08/2008	Fri	04:20	500 m E	BUCHANAN RD	2WY	STR	Fine	Dry	100	1	CAR	M57	E in JOHN RENSHAW DR	100	Proceeding in lane	N	0	0	
E34954549					Darkness	DCA: 609		On path - Hit animal				Kangaroo								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
635138	15/08/2008	Fri	15:30	1 km W	AVERYS LANE	2WY	STR	Fine	Dry	90	2	OMV	U U	W in JOHN RENSHAW DR	Unk	Pulling out	N	0	0	
E35093228					Daylight	DCA: 401		Manov - Leaving parking				CAR	F22	W in JOHN RENSHAW DR	90	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
664466	22/08/2008	Fri	16:45	100 m E	NEWCASTLE EXP	DIV	STR	Raining	Wet	80	3	CAR	M18	E in JOHN RENSHAW DR	40	Incorrect side	N	0	0	
E35107143					Dusk	DCA: 201		Opp - Head on				VAN	F48	W in JOHN RENSHAW DR	40	Proceeding in lane				
												TRK	U U	W in JOHN RENSHAW DR	40	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
636383	27/08/2008	Wed	06:15	2.5 km W	NEWCASTLE EXP	2WY	STR	Fine	Dry	100	2	CAR	M21	S in JOHN RENSHAW DR	95	Incorrect side	N	0	0	F
E34601036					Daylight	DCA: 201		Opp - Head on				WAG	M22	N in JOHN RENSHAW DR	95	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
636054	27/08/2008	Wed	10:49	100 m W	GEORGE BOOTH DR	2WY	STR	Fine	Dry	60	2	CAR	F23	E in JOHN RENSHAW DR	Unk	Proceeding in lane	N	0	0	
E116548197					Daylight	DCA: 301		Same - Rear end				UTE	M25	E in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
635511	27/08/2008	Wed	15:50	at	BUCHANAN RD	TJN	STR	Fine	Dry	100	3	4WD	F30	W in JOHN RENSHAW DR	80	Proceeding in lane	N	0	0	
E34913121					Daylight	DCA: 301		Same - Rear end				4WD	M37	S in JOHN RENSHAW DR	0	Stationary				
												CAR	M20	W in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
636387	27/08/2008	Wed	15:50	50 m E	WALLSEND ST	2WY	STR	Fine	Dry	90	3	WAG	M34	W in JOHN RENSHAW DR	50	Proceeding in lane	N	0	0	
E35189243					Daylight	DCA: 301		Same - Rear end				CAR	M17	W in JOHN RENSHAW DR	0	Stationary				
												CAR	F61	W in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
640654	02/09/2008	Tue	16:50	at	BUCHANAN RD	TJN	STR	Fine	Dry	70	2	4WD	M18	S in BUCHANAN RD	10	Turning right	I	0	1	
E34515860					Daylight	DCA: 104		Adj - Right-thru from right				CAR	M64	E in JOHN RENSHAW DR	60	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
640616	28/09/2008	Sun	11:45	at	NEWCASTLE EXP	RDB	CRV	Fine	Dry	60	2	CAR	F57	N in NEWCASTLE EXP	Unk	Proceeding in lane	N	0	0	
E35161318					Daylight	DCA: 603		On path - Previous accident				4WD	F45	N in NEWCASTLE EXP	0	Broken down				

Detailed Crash Report - sorted

Natural Lighting

S F

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
650413	11/11/2008	Tue	06:55	at	BUCHANAN RD	TJN	STR	Fine	Dry	60	2	CAR	F19	E in BUCHANAN RD	5	Turning right	N	0	0	
E35320317					Daylight	DCA: 202		Opp - Right-thru				TRK	M45	W in BUCHANAN RD	60	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
647562	28/11/2008	Fri	13:00	30 m W	NEW ENGLAND HWY	DIV	CRV	Raining	Wet	80	1	CAR	F62	N in JOHN RENSHAW DR	60	Proceeding in lane	N	0	0	S
E35545772					Daylight	DCA: 803	R	Off right bend into obj				Fence								
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
647607	30/11/2008	Sun	17:00	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	4WD	F36	N in NEWCASTLE EXP	40	Turning right	N	0	0	
E38174786					Daylight	DCA: 308		Same - Rgt turn side swipe				CAR	F22	N in NEWCASTLE EXP	40	Turning right				
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
651987	20/12/2008	Sat	17:00	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	CAR	F53	N in NEWCASTLE EXP	60	Turning right	I	0	1	
E35794047					Daylight	DCA: 308		Same - Rgt turn side swipe				4WD	F21	N in NEWCASTLE EXP	60	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
654589	30/01/2009	Fri	20:10	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	M/C	M43	N in NEWCASTLE EXP	25	Turning right	I	0	1	
E35998044					Darkness	DCA: 308		Same - Rgt turn side swipe				CAR	M19	N in NEWCASTLE EXP	40	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
655692	12/02/2009	Thu	05:30	40 m E	OLD BUTTAI RD	2WY	STR	Overcast	Dry	100	1	4WD	F23	E in JOHN RENSHAW DR	90	Proceeding in lane	N	0	0	
E36261233					Darkness	DCA: 704		Right off cway into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
659830	10/03/2009	Tue	09:15	350 m W	AVERYS LANE	2WY	STR	Fine	Dry	90	2	VAN	F45	E in JOHN RENSHAW DR	Unk	Proceeding in lane	I	0	1	
E36556614					Daylight	DCA: 301		Same - Rear end				CAR	M38	E in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
669538	08/04/2009	Wed	17:20	at	NEW ENGLAND HWY	RDB	CRV	Fine	Dry	60	2	CAR	F40	W in JOHN RENSHAW DR	5	Proceeding in lane	I	0	1	
E37456963					Dusk	DCA: 101		Adj - Cross traffic				4WD	M33	S in NEW ENGLAND HWY	50	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
670287	02/05/2009	Sat	10:30	at	WALLSEND ST	TJN	STR	Fine	Dry	60	2	WAG	F23	W in JOHN RENSHAW DR	Unk	Proceeding in lane	I	0	3	
E38003739					Daylight	DCA: 303		Same - Rear right				CAR	F U	W in JOHN RENSHAW DR	0	Wait turn right				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
696060	09/05/2009	Sat	15:05	at	NEW ENGLAND HWY	RDB	STR	Fine	Dry	60	1	CAR	M53	S in NEW ENGLAND HWY	40	Other forward	N	0	0	
E37159122					Daylight	DCA: 700		Other straight												

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
				Natural Lighting																**S F**
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
667810	12/05/2009	Tue	21:00	540 m E	NEWCASTLE EXP	DIV	STR	Fine	Dry	80	1	WAG	M25	E in JOHN RENSHAW DR	60	Proceeding in lane	N	0	0	F
E37293813					Darkness	DCA: 703		Left off cway into object				Drain/culvert								
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**Maitland Rd**											
683980	18/05/2009	Mon	09:00	5 m N	MULBRING ST	TJN	STR	Fine	Dry	60	2	OMV	U U	N in MAITLAND RD	Unk	Proceeding in lane	N	0	0	
E38740018					Daylight	DCA: 303		Same - Rear right				CAR	F60	N in MAITLAND RD	0	Wait turn right				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
667601	21/05/2009	Thu	07:15	200 m W	AVERYS LANE	2WY	STR	Raining	Wet	80	2	CAR	M18	E in JOHN RENSHAW DR	80	Proceeding in lane	N	0	0	
E37698373					Daylight	DCA: 301		Same - Rear end				CAR	F37	E in JOHN RENSHAW DR	50	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
669396	04/06/2009	Thu	14:45	at	NEWCASTLE EXP	RDB	STR	Overcast	Wet	60	2	SEM	M29	N in JOHN RENSHAW DR	20	Turning right	N	0	0	
E37314335					Daylight	DCA: 308		Same - Rgt turn side swipe				CAR	M37	N in JOHN RENSHAW DR	20	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
674268	09/06/2009	Tue	16:30	50 m E	RHONDDA ST	2WY	STR	Fine	Dry	60	2	CAR	M29	W in JOHN RENSHAW DR	60	Proceeding in lane	N	0	0	
E37750621					Daylight	DCA: 301		Same - Rear end				WAG	F35	W in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
675407	14/07/2009	Tue	12:39	1 km W	WEAKLEYS DR	2WY	STR	Fine	Dry	40	2	SEM	M41	W in JOHN RENSHAW DR	80	Proceeding in lane	I	0	1	S
E38216873					Daylight	DCA: 301		Same - Rear end				CAR	M23	W in JOHN RENSHAW DR	50	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
679736	28/07/2009	Tue	13:50	at	MAITLAND ST	TJN	STR	Fine	Dry	50	2	TRK	M39	W in JOHN RENSHAW DR	40	Proceeding in lane	I	0	1	
E38894865					Daylight	DCA: 303		Same - Rear right				CAR	F54	W in JOHN RENSHAW DR	0	Wait turn right				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
678813	13/08/2009	Thu	20:10	500 m W	UNNAMED RD	2WY	CRV	Fine	Dry	60	1	CAR	F46	E in JOHN RENSHAW DR	60	Proceeding in lane	N	0	0	
E38349621					Darkness	DCA: 606		On path - Hit temp roadwork				Roadwork equipment								
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
678796	13/08/2009	Thu	22:10	500 m W	UNNAMED RD	2WY	CRV	Fine	Dry	60	1	CAR	M63	W in JOHN RENSHAW DR	Unk	Proceeding in lane	I	0	1	
E37736660					Darkness	DCA: 606		On path - Hit temp roadwork				Roadwork equipment								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
679465	20/08/2009	Thu	07:15	700 m E	BUCHANAN RD	2WY	STR	Fine	Dry	60	2	4WD	M47	W in JOHN RENSHAW DR	65	Incorrect side	I	0	1	S F
E225140892					Daylight	DCA: 201		Opp - Head on				TRK	M51	E in JOHN RENSHAW DR	60	Proceeding in lane				

Detailed Crash Report - sorted

Natural Lighting

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors S F
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
682781	06/09/2009	Sun	00:15	3.6 km W	NEW ENGLAND HWY	2WY	CRV	Fine	Dry	60	1	CAR	M35	E in JOHN RENSHAW DR	80	Proceeding in lane	I	0	1	S
E40496084					Darkness	DCA: 804	R	Off left bend into obj				Tree/bush								
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
683728	28/09/2009	Mon	08:20	10 m W	GEORGE BOOTH DR	RDB	STR	Fine	Dry	60	3	CAR	F43	E in JOHN RENSHAW DR	30	Proceeding in lane	N	0	0	
E38329344					Daylight	DCA: 301		Same - Rear end				CAR	F54	E in JOHN RENSHAW DR	0	Stationary				
												CAR	M22	E in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
686290	19/10/2009	Mon	09:30	50 m E	BLACK HILL RD	2WY	STR	Fine	Dry	60	2	CAR	M35	W in JOHN RENSHAW DR	Unk	Proceeding in lane	N	0	0	
E38693433					Daylight	DCA: 301		Same - Rear end				CAR	M40	W in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
703819	15/11/2009	Sun	12:00	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	1	M/C	M40	N in NEWCASTLE EXP	Unk	Proceeding in lane	I	0	1	
E39990659					Daylight	DCA: 705		Out of control on cway												
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
691373	21/11/2009	Sat	10:00	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	M/C	M56	S in NEWCASTLE EXP	15	Turning right	N	0	0	
E177004393					Daylight	DCA: 202		Opp - Right-thru				CAR	F83	N in NEWCASTLE EXP	15	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
690825	30/11/2009	Mon	17:15	at	GEORGE BOOTH DR	RDB	CRV	Raining	Wet	60	1	4WD	M54	E in JOHN RENSHAW DR	60	Proceeding in lane	N	0	0	S
E177241093					Daylight	DCA: 803	L	Off right bend into obj				Utility pole								
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
695330	08/12/2009	Tue	12:30	2 km W	NEW ENGLAND HWY	2WY	STR	Fine	Dry	40	2	CAR	M38	W in JOHN RENSHAW DR	50	Proceeding in lane	I	0	1	S
E39220254					Daylight	DCA: 301		Same - Rear end				4WD	M58	W in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
687372	20/12/2009	Sun	03:40	730 m E	BUCHANAN RD	2WY	STR	Overcast	Dry	100	2	CAR	M20	E in JOHN RENSHAW DR	100	Proceeding in lane	F	1	1	
E39899851					Darkness	DCA: 5		Ped - Walking with traffic				PED	M33	E in JOHN RENSHAW DR		Walk with traffic				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
693022	21/12/2009	Mon	15:10	at	BUCHANAN RD	TJN	STR	Fine	Dry	80	2	TRK	M63	S in BUCHANAN RD	Unk	Turning left	N	0	0	
E42005086					Daylight	DCA: 107		Adj - Left-thru from right				WAG	M23	E in JOHN RENSHAW DR	Unk	Proceeding in lane				

Detailed Crash Report - sorted

Natural Lighting

S F

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
Hunter Region				**Newcastle City LGA**		**Black Hill**			**John Renshaw Dr**											
697978	30/01/2010	Sat	18:30	at	NEWCASTLE EXP	RDB	CRV	Fine	Dry	70	1	M/C	M45	N in NEWCASTLE EXP	30	Proceeding in lane	I	0	1	
E42411786					Daylight	DCA: 607		On path - Hit temp object				Other non fixed object								
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
702517	12/03/2010	Fri	07:40	10 m W	BLACK HILL RD	TJN	STR	Fine	Dry	60	2	CAR	F17	E in JOHN RENSHAW DR	60	Proceeding in lane	I	0	1	
E40405338					Daylight	DCA: 301		Same - Rear end				CAR	M24	E in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
703122	17/03/2010	Wed	13:00	at	BUCHANAN RD	TJN	STR	Fine	Dry	80	2	WAG	M17	S in BUCHANAN RD	10	Proceeding in lane	N	0	0	
E40414245					Daylight	DCA: 101		Adj - Cross traffic				CAR	M53	E in JOHN RENSHAW DR	75	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
699716	19/04/2010	Mon	16:40	205 m W	GEORGE BOOTH DR	2WY	STR	Fine	Dry	60	2	M/C	M51	W in JOHN RENSHAW DR	900	Pull out opposite	F	1	0	S
E41175867					Daylight	DCA: 501		Ovtak - Head on				CAR	M17	E in JOHN RENSHAW DR	65	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
710709	07/05/2010	Fri	14:10	180 m W	GEORGE BOOTH DR	2WY	STR	Fine	Dry	80	3	WAG	F19	E in JOHN RENSHAW DR	90	Proceeding in lane	N	0	0	S
E40623836					Daylight	DCA: 301		Same - Rear end				CAR	F46	E in JOHN RENSHAW DR	60	Proceeding in lane				
												UTE	M67	E in JOHN RENSHAW DR	60	Proceeding in lane				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
713314	14/05/2010	Fri	07:30	5 m E	NEWCASTLE EXP	RDB	STR	Fine	Dry	70	2	SEM	M45	W in JOHN RENSHAW DR	Unk	Proceeding in lane	I	0	1	
E41056457					Daylight	DCA: 301		Same - Rear end				M/C	M57	W in JOHN RENSHAW DR	0	Stationary				
Hunter Region				**Newcastle City LGA**		**Beresfield**			**John Renshaw Dr**											
711901	27/05/2010	Thu	11:30	at	NEWCASTLE EXP	RDB	STR	Fine	Dry	60	2	CAR	M80	W in JOHN RENSHAW DR	25	Proceeding in lane	N	0	0	
E41062105					Daylight	DCA: 305		Same - Lane side swipe				SEM	M51	W in JOHN RENSHAW DR	20	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Black Hill**			**John Renshaw Dr**											
712687	04/06/2010	Fri	02:20	1.47 km W	NEWCASTLE EXP	2WY	STR	Raining	Wet	100	1	CAR	M27	E in JOHN RENSHAW DR	Unk	Proceeding in lane	I	0	1	
E40839617					Darkness	DCA: 704		Right off cway into obj				Utility pole								
Hunter Region				**Cessnock City LGA**		**Stanford Merth**			**John Renshaw Dr**											
715198	18/06/2010	Fri	14:15	1 km E	WALLSEND ST	2WY	STR	Fine	Dry	90	2	CAR	M19	E in JOHN RENSHAW DR	40	Proceeding in lane	N	0	0	
E41503540					Daylight	DCA: 703		Left off cway into object				CAR	M19	W in JOHN RENSHAW DR	0	Stationary				
												Fence								

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
					Natural Lighting															**S F**
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
714623	19/06/2010	Sat	17:30	at	BUCHANAN RD	TJN	STR	Fine	Dry	60	2	CAR	M55	S in BUCHANAN RD	Unk	Turning right	I	0	2	
E41066936					Dusk	DCA: 104		Adj - Right-thru from right				M/C	M30	E in JOHN RENSHAW DR	Unk	Proceeding in lane				
Hunter Region				**Cessnock City LGA**		**Buchanan**			**John Renshaw Dr**											
724961	23/06/2010	Wed	13:00	at	BUCHANAN RD	TJN	STR	Fine	Wet	60	2	CAR	F24	S in BUCHANAN RD	10	Proceeding in lane	I	0	1	S
E41077475					Daylight	DCA: 101		Adj - Cross traffic				CAR	M33	E in JOHN RENSHAW DR	70	Proceeding in lane				

Report Totals: Total Crashes: 131 Fatal Crashes: 3 Injury Crashes: 62 Killed: 3 Injured: 83

Crashid dataset John Renshaw Drive between New England Hwy at Beresfield (exc) to Maitland St, Kurri Kurri (Inc). Crash Period 01/07/05 to 30/06/10 (finalised data).

Note: Ordered by: Crash Date,Crash Time,Crash No.

Attachment B. Traffic Survey Results

Tasman Mine Access

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun	W/Day	W/End	7 Day
Time	4-Jul-11	5-Jul-11	29/06/2011	30-Jun-11	1-Jul-11	2-Jul-11	3-Jul-11	Ave.	Ave.	Ave
0:00	0	0	4	0	3	0	0	1	0	1
1:00	0	3	1	1	0	2	0	1	1	1
2:00	0	3	0	0	0	1	0	1	1	1
3:00	0	2	0	0	0	1	0	0	1	0
4:00	5	2	3	4	3	3	0	3	2	3
5:00	15	11	15	16	17	12	6	15	9	13
6:00	41	42	31	41	34	19	5	38	12	30
7:00	39	29	31	40	35	17	1	35	9	27
8:00	35	38	29	22	35	1	0	32	1	23
9:00	37	24	28	27	21	2	0	27	1	20
10:00	22	21	20	19	30	1	0	22	1	16
11:00	30	27	18	32	29	0	0	27	0	19
12:00	35	36	32	40	13	2	4	31	3	23
13:00	33	40	43	34	17	0	0	33	0	24
14:00	47	35	36	25	16	0	1	32	1	23
15:00	37	24	25	9	11	2	2	21	2	16
16:00	47	38	40	20	24	17	2	34	10	27
17:00	35	18	10	12	1	4	8	15	6	13
18:00	9	3	4	0	3	6	1	4	4	4
19:00	11	3	1	4	3	1	0	4	1	3
20:00	11	10	12	13	11	1	5	11	3	9
21:00	11	8	9	12	9	0	**9**	10	5	8
22:00	17	22	20	19	18	0	0	19	0	14
23:00	5	5	2	3	0	2	0	3	1	2
Total	**522**	**444**	**414**	**393**	**333**	**94**	**44**	**421**	**69**	**321**

George Booth Drive

Day Time	Mon 4-Jul-11	Tue 5-Jul-11	Wed 29/06/2011	Thu 30-Jun-11	Fri 1-Jul-11	Sat 2-Jul-11	Sun 3-Jul-11	W/Day Ave.	W/End Ave.	7 Day Ave
0:00	17	36	34	29	42	50	61	32	55	38
1:00	7	17	9	22	26	19	22	16	20	17
2:00	10	7	7	9	12	13	13	9	13	10
3:00	18	15	33	23	25	15	9	23	12	20
4:00	92	92	104	107	89	38	19	97	28	77
5:00	420	413	422	418	396	129	46	414	88	321
6:00	772	798	790	813	776	194	78	790	136	603
7:00	685	702	805	779	713	237	92	737	165	573
8:00	561	555	758	658	668	361	170	640	266	533
9:00	414	458	461	511	447	390	340	458	365	431
10:00	398	425	407	382	440	502	372	411	437	418
11:00	402	439	429	416	451	543	439	427	491	446
12:00	429	490	517	445	466	524	419	469	471	470
13:00	452	531	508	461	501	490	368	491	429	473
14:00	550	540	563	571	609	437	424	567	431	528
15:00	758	765	854	782	874	473	461	807	467	710
16:00	898	913	893	939	943	473	435	917	454	785
17:00	857	927	811	905	827	481	361	865	421	738
18:00	327	354	342	431	369	233	171	365	202	318
19:00	150	158	166	206	184	125	105	173	115	156
20:00	118	99	139	153	116	101	99	125	100	118
21:00	91	109	121	136	110	89	71	113	80	104
22:00	68	71	81	96	98	132	41	83	87	84
23:00	38	38	42	46	68	85	19	47	52	48
Total	**8531**	**8954**	**9299**	**9337**	**9250**	**6135**	**4638**	**9074**	**5386**	**8020**

Includes adjustment for school holidays (refer Section 3.7.1)

John Renshaw Drive West of CHPP access

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun	W/Day	W/End	7 Day
Time	23-May-11	24-May-11	25-May-11	19/05/2011	20-May-11	21-May-11	22-May-11	Ave.	Ave.	Ave
0:00	22	43	54	48	52	66	94	44	80	54
1:00	22	29	38	37	39	55	50	33	53	39
2:00	21	36	38	41	32	30	26	34	28	32
3:00	37	44	42	54	48	34	32	45	33	42
4:00	110	130	109	145	113	73	29	121	51	101
5:00	466	496	501	522	522	194	76	501	135	397
6:00	759	853	757	857	767	252	135	799	194	626
7:00	785	850	799	833	784	286	152	810	219	641
8:00	649	719	659	731	659	419	224	683	322	580
9:00	515	600	536	520	547	407	333	544	370	494
10:00	499	493	452	464	501	550	450	482	500	487
11:00	440	478	429	473	521	583	457	468	520	483
12:00	463	487	427	513	596	563	419	497	491	495
13:00	484	514	473	542	609	498	388	524	443	501
14:00	618	680	652	685	699	454	431	667	443	603
15:00	829	946	974	902	869	408	467	904	438	771
16:00	829	948	927	875	889	487	485	894	486	777
17:00	717	849	866	840	749	447	362	804	405	690
18:00	336	389	415	387	447	298	191	395	245	352
19:00	192	191	212	229	231	173	167	211	170	199
20:00	177	167	177	204	178	133	96	181	115	162
21:00	147	146	188	176	154	134	73	162	104	145
22:00	115	127	123	146	156	175	78	133	127	131
23:00	78	71	66	80	87	116	39	76	78	77
Total	**9310**	**10286**	**9914**	**10304**	**10249**	**6835**	**5254**	**10013**	**6045**	**8879**

Tasman - Donaldson Mine: Travel Time Survey Results

Date	25/05/2011										24/05/2011													Average	Min	Max
Start Time	7:11	7:43	8:30	9:03	9:33	10:19	10:58	11:28	12:05	12:45	13:22	13:53	14:26	15:43	16:13	16:50	17:29	18:15	18:51	19:23	19:55	20:44		Mins	Mins	Mins
Donaldson Mine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
John Renshaw Dr	6	5.9	6.58	6.13	5.92	7.06	5.83	5.33	5.63	5.6	5.8	5.88	5.75	5.98	6.22	5.82	5.77	7.1	6.18	6.47	6.32	6.58		6.10	5.33	7.10
Richmond Vale Rd	2.27	2.25	2.3	2.37	2.22	2.55	2.17	2.1	2.17	2.05	2.27	2.32	2.37	2.3	2.47	2.3	2.35	2.43	2.35	2.35	2.37	2.27		2.30	2.05	2.55
Orica Access	1.43	1.43	1.48	1.4	1.4	1.38	1.25	1.28	1.38	1.22	1.47	1.45	1.43	1.4	1.42	1.43	1.45	1.42	1.4	1.38	1.6	1.27		1.40	1.22	1.60
Access Rd	0.88	0.87	0.87	0.87	0.85	0.88	0.85	0.78	0.85	0.78	0.85	0.9	0.88	0.85	0.9	0.88	0.88	0.93	0.95	0.82	0.87	0.82		0.86	0.78	0.95
Tasman Mine	2.72	2.97	2.82	2.52	2.57	2.85	2.37	2.95	2.29	2.73	2.63	2.63	2.55	3.28	2.7	2.65	2.77	2.82	2.85	2.8	2.45	2.6		2.89	2.29	6.43
	13.3	13.4	14.1	13.3	13	14.7	14.7	12.4	12.3	12.4	13	13.2	13	13.8	13.7	13.1	13.2	14.7	13.7	13.8	13.6	13.5				

Start Time	7:26	8:12	8:47	9:19	10:02	10:33	11:15	11:41	12:31	12:57	12:51	13:35	14:06	14:39	15:57	16:28	17:12	17:48	18:01	18:34	19:07	19:39	20:32			
Tasman Mine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Access Rd	2.67	3.95	2.57	2.52	2.62	2.73	2.6	3.03	2.43	2.27	3.2	2.88	3.57	2.53	3.2	3.8	2.78	3.53	2.63	2.56	2.68	3.38	2.53	2.89	2.27	3.95
Orica Access	1.75	0.95	0.85	0.83	0.83	0.8	0.83	0.87	0.8	0.77	0.97	0.85	0.92	0.83	0.85	0.87	0.87	0.93	0.87	0.85	0.87	0.85	0.78	0.90	0.77	1.75
Richmond Vale Rd	1.42	1.57	1.4	1.4	1.4	1.42	1.37	1.42	1.3	1.32	1.6	1.45	1.45	1.42	1.47	1.5	1.4	1.47	1.43	1.35	1.37	1.33	1.3	1.43	1.30	1.60
John Renshaw Dr	2.53	2.92	2.52	2.45	2.43	2.4	2.27	2.35	2.32	2.13	2.75	2.47	2.72	2.47	2.63	2.78	2.77	2.92	2.77	2.73	2.55	2.57	2.33	2.57	2.13	2.92
Donaldson Mine	5.97	6.62	5.75	5.87	6.47	5.7	5.28	5.63	5.18	5.47	5.43	5.73	6.45	5.72	5.32	6.72	6.34	6.13	6.85	6.13	6.08	5.88	5.75	5.94	5.18	6.85
	14.3	16	13.1	13.1	13.8	13.1	12.4	13.3	12	12	14	13.4	15.1	13	13.5	15.7	14.2	15	14.6	13.6	13.6	14	12.7	13.73	11.65	17.07

Note: Shaded sections indicate where a Tasman Coal Truck was encountered within that section of the trip.
Our drivers attempted to tag on behind the Tasman Mine trucks where possible. However, the truck drivers either slowed down or pulled over if our driver stayed behind.

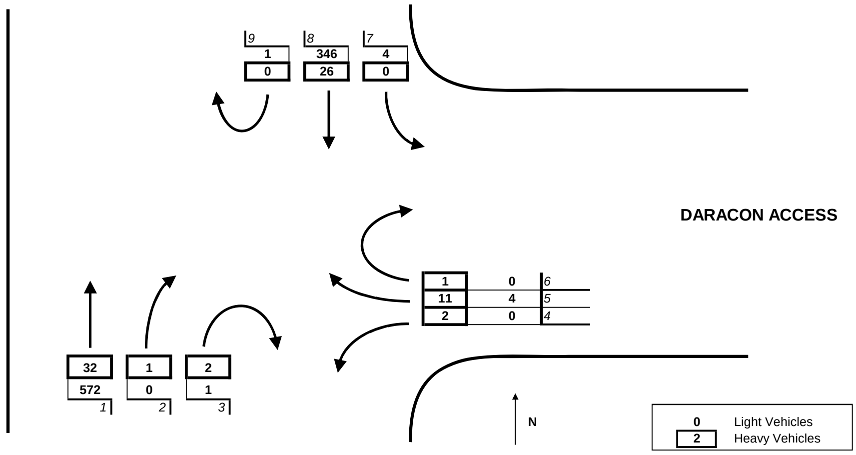
9/2/2012 - GEORGE BOOTH DVE / DARACON ACCESS RD,

8:30 <<< HOUR ENDING **Thursday**

Summary:
GEORGE BOOTH DVE / DARACON ACCESS RD
928 **Total Light Vehicles**
75 **Total Heavy Vehicles**

Quality Surveys

GEORGE BOOTH DVE



9/2/2012 - GEORGE BOOTH DVE / DARACON ACCESS RD,

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
06:15	128	5	0	0	0	0	5	52	0	190	
06:30	162	4	1	2	0	0	12	90	0	271	
06:45	165	0	0	0	2	0	2	80	0	249	
07:00	128 <	0 <	0	0 <	0	0	0 <	79	0	207	917
07:15	114	0	1 <	0 <	0	0	1	70	0	186	913
07:30	127	0	0	0	0	0	1	85	0	213	855
07:45	152	0	0	0	1	0	1	121	0	275	881
08:00	141	0	0	0	0	0	1	73	0	215	889
08:15	131	0	0	0	2	0	2	87 <	0	222	925
08:30	148	0	1	0	1 <	0	0	65	1 <	216	928 <
08:45	133	1	0	0	0	0	0	68	0 <	202	855
09:00	63	0	0	0	0	1 <	1	36	0 <	101	741

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
06:15	5	1	0	0	0	0	0	9	0	15	
06:30	7	1	0	0	0	0	2	11	0	21	
06:45	11	0	1	0	0	0	0	11	0	23	
07:00	11	0 <	3	0	0	0	1	8 <	0	23	82
07:15	18	1 <	1	0	0	0	1 <	5	0	26	93
07:30	12 <	0	0	0	8	0	0	6	0	26	98
07:45	7	0	2 <	1	9	1 <	0	7	0	27	102 <
08:00	8	0	0	0	1 <	0 <	0	9	0	18	97
08:15	8	0	0	0	0 <	0 <	0	2	0	10	81
08:30	9	1	0	1 <	1	0 <	0	8	0	20	75
08:45	10	0	0	0	0	0	0	6	0	16	64
09:00	8	0	0	0	0	0	2	4	0	14	60

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
06:15	133	6	0	0	0	0	5	61	0	205	
06:30	169	5	1	2	0	0	14	101	0	292	
06:45	176	0	1	0	2	0	2	91	0	272	
07:00	139 <	0 <	3	0 <	0	0	1 <	87	0	230	999
07:15	132	1	2 <	0 <	0	0	2	75	0	212	1006 <
07:30	139	0	0	0	8	0	1	91	0	239	953
07:45	159	0	2 <	1	10	1 <	1	128	0	302	983
08:00	149	0	0	0	1	0 <	1	82	0	233	986
08:15	139	0	0	0	2 <	0 <	2	89 <	0	232	1006 <
08:30	157	1	1	1 <	2	0 <	0	73	1 <	236	1003
08:45	143	1	0	0	0	0	0	74	0 <	218	919
09:00	71	0	0	0	0	1 <	3	40	0 <	115	801

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

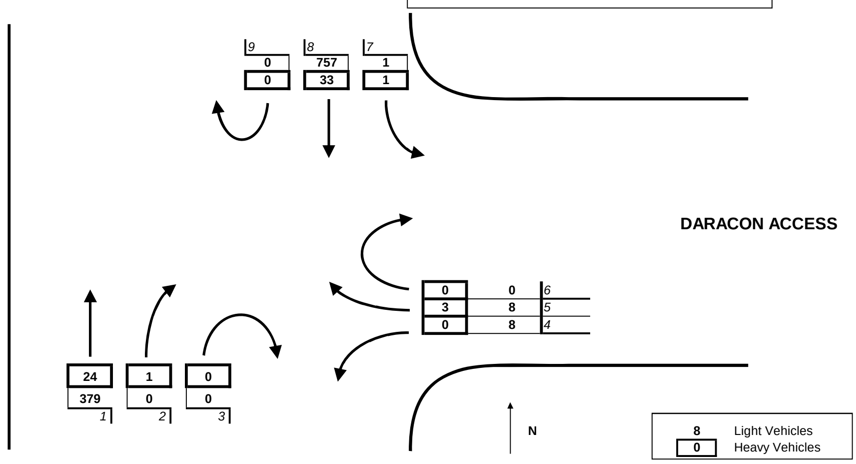
9/2/2012 - GEORGE BOOTH DVE / DARACON ACCESS RD,

17:45 <<< HOUR ENDING **Thursday**

Summary:
GEORGE BOOTH DVE / DARACON ACCESS RD
1153 **Total Light Vehicles**
62 **Total Heavy Vehicles**

Quality Surveys

GEORGE BOOTH DVE



9/2/2012 - GEORGE BOOTH DVE / DARACON ACCESS RD,

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
15:15	83	0	0	0	1	0	1	83	0	168	
15:30	81	0	0	0	1	0	0	113	0	195	
15:45	115	0	0	0	1	0	0	123	0	239	
16:00	103	0	1 <	0	2	0	0	130	0	236	838
16:15	104	0	0 <	1	0	0	0	136	0	241	911
16:30	93 <	0	0 <	0	0	0	0	177	0	270	986
16:45	110	0	0 <	0	1	0	3	155	0	269	1016
17:00	105	0	0	0	0	0	0	175	0	280	1060
17:15	87	0	0	1	2	0	0	182	0	272	1091
17:30	98	0	0	3	4	0	1 <	212	0	318	1139
17:45	89	0	0	4 <	2	0	0	188 <	0	283	1153 <
18:00	46	0	0	0 <	1 <	0	1	110	0	158	1031

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
15:15	12	0	0	0	0	0	0	11	0	23	
15:30	4	0	0	0	0	1	0	8	0	13	
15:45	6	0	0	0	0	0	0	11	0	17	
16:00	1	1	0	0	0	1 <	0	12	0	15	68
16:15	8	1	0	1 <	0	0 <	0	13	0	23	68
16:30	2	1 <	0	0 <	0	0	0	10 <	0	13	68
16:45	11	0 <	0	0 <	1	0	1	9	0	22	73
17:00	6	1 <	0	0 <	2	0	0	7	0	16	74 <
17:15	8	0	0	0	0	0	1 <	6	0	15	66
17:30	7 <	0	0	0	1 <	0	0 <	10	0	18	71
17:45	3	0	0	0	0	0	0	10	0	13	62
18:00	5	0	0	0	2	0	1 <	1	0	9	55

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
15:15	95	0	0	0	1	0	1	94	0	191	
15:30	85	0	0	0	1	1	0	121	0	208	
15:45	121	0	0	0	1	0	0	134	0	256	
16:00	104	1	1 <	0	2	1 <	0	142	0	251	906
16:15	112	1	0 <	2	0	0 <	0	149	0	264	979
16:30	95	1 <	0 <	0	0	0	0	187	0	283	1054
16:45	121	0 <	0 <	0	2	0	4	164	0	291	1089
17:00	111 <	1 <	0	0	2	0	0	182	0	296	1134
17:15	95	0	0	1	2	0	1	188	0	287	1157
17:30	105	0	0	3	5	0	1 <	222	0	336	1210
17:45	92	0	0	4 <	2	0	0	198 <	0	296	1215 <
18:00	51	0	0	0 <	3 <	0	2	111	0	167	1086

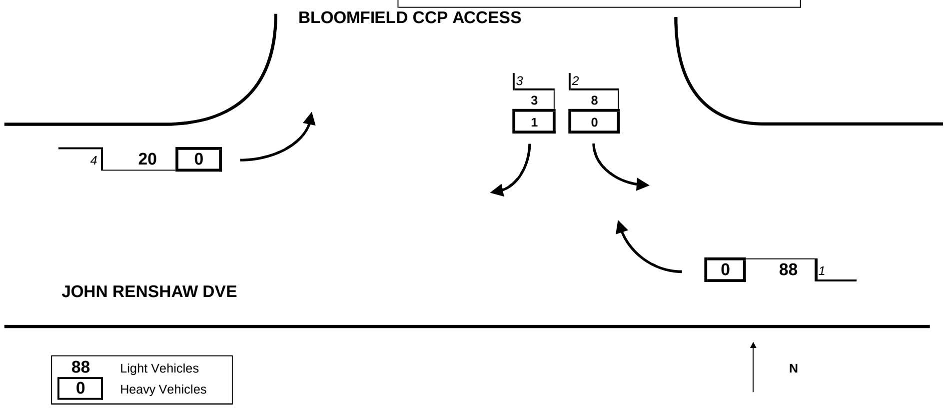
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

9/2/2012 - JOHN RENSHAW DVE / BLOOMFIELD CCP ACCESS, BUCHANAN

7:00 <<< HOUR ENDING Thursday

Summary:
JOHN RENSHAW DVE / BLOOMFIELD CCP ACCESS
124 Total Light Vehicles
1 Total Heavy Vehicles

Quality Surveys



9/2/2012 - JOHN RENSHAW DVE / BLOOMFIELD CCP ACCESS, BUCHANAN

	Light Vehicles				Total Vehicles		Pedestrians		
	1	2	3	4	15 MIN	HOUR	7	8	9
06:15	37	2	0	4	43		0	0	0
06:30	20	1	1	2	24		0	0	0
06:45	16	5	1	4	26		0	0	0
07:00	15 <	0	1	10 <	26	119 <	0	0	0
07:15	4	2	3	1	10	86	0	0	0
07:30	9	1	3	3	16	78	0	0	0
07:45	4	4	1	1	10	62	0	0	0
08:00	1	18	6 <	1	26	62	0	0	0
08:15	3	3	1	3	10	62	0	0	0
08:30	7	4 <	2	2	15	61	0	0	0
08:45	3	2	0	2	7	58	0	0	0
09:00	5	2	0	1	8	40	0	0	0

	Heavy Vehicles				Total Vehicles	
	1	2	3	4	15 MIN	HOUR
06:15	0	0	1	0	1	
06:30	0	0	0	0	0	
06:45	0	0	0	0	0	
07:00	0	0	0	0	0	1
07:15	0	0	0	2	2	2
07:30	4	0	0	4	8	10
07:45	1	0	4	0	5	15
08:00	0	1	3 <	0	4	19 <
08:15	1 <	0	0 <	1	2	19 <
08:30	0	1 <	0 <	4	5	16
08:45	0	0 <	2	3 <	5	16
09:00	0	0	5 <	0 <	5	17

	All Vehicles				Total Vehicles	
	1	2	3	4	15 MIN	HOUR
06:15	37	2	1	4	44	
06:30	20	1	1	2	24	
06:45	16	5	1	4	26	
07:00	15 <	0	1	10	26	120 <
07:15	4	2	3	3	12	88
07:30	13	1	3	7 <	24	88
07:45	5	4	5	1	15	77
08:00	1	19	9 <	1	30	81
08:15	4	3	1	4	12	81
08:30	7	5 <	2	6	20	77
08:45	3	2	2	5	12	74
09:00	5	2	5	1	13	57

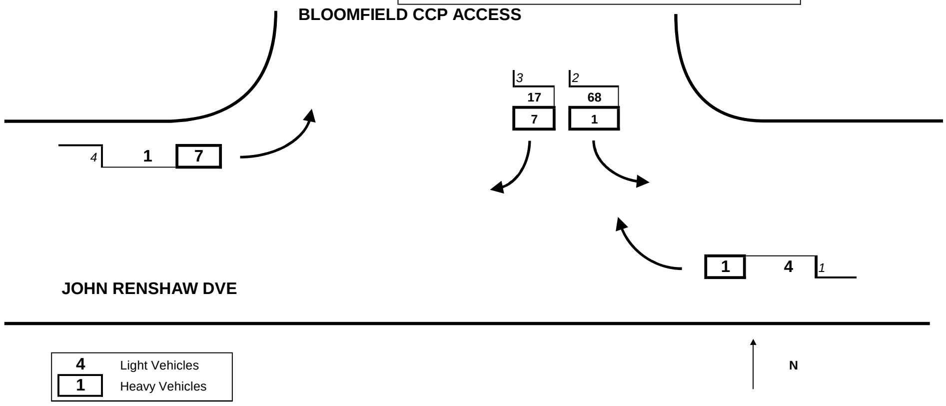
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

9/2/2012 - JOHN RENSHAW DVE / BLOOMFIELD CCP ACCESS, BUCHANAN

17:00 <<< HOUR ENDING **Thursday**

Summary:
JOHN RENSHAW DVE / BLOOMFIELD CCP ACCESS
141 Total Light Vehicles
16 Total Heavy Vehicles

Quality Surveys



9/2/2012 - JOHN RENSHAW DVE / BLOOMFIELD CCP ACCESS, BUCHANAN

Light Vehicles / **Total Vehicles**

	1	2	3	4	15 MIN	HOUR
15:15	3	5	0	3	11	
15:30	4	7	1	2	14	
15:45	5	1	2	2	10	
16:00	2 <	10	0	5 <	17	52
16:15	2	11	8	0	21	62
16:30	1	12	4	0	17	65
16:45	1	18	3	0	22	77
17:00	0	27	2 <	1	30	90 <
17:15	2	17 <	1	0	20	89
17:30	1	3	1	0	5	77
17:45	1	5	0	0	6	61
18:00	0	0	0	0	0	31

Heavy Vehicles / **Total Vehicles**

	1	2	3	4	15 MIN	HOUR
15:15	1	0	1	0	2	
15:30	1	0	0	2	3	
15:45	1	2	0	2	5	
16:00	0 <	2	3	4	9	19
16:15	0	1 <	3	1 <	5	22 <
16:30	0	0 <	2	1	3	22 <
16:45	0	0	1 <	2	3	20
17:00	1	0	1	3	5	16
17:15	0	1	0	2	3	14
17:30	0	1	5	1	7	18
17:45	0	0	0	2	2	17
18:00	0	3 <	0	2	5	17

All Vehicles / **Total Vehicles**

	1	2	3	4	15 MIN	HOUR
15:15	4	5	1	3	13	
15:30	5	7	1	4	17	
15:45	6	3	2	4	15	
16:00	2 <	12	3	9 <	26	71
16:15	2	12	11	1	26	84
16:30	1	12	6	1	20	87
16:45	1	18	4 <	2	25	97
17:00	1	27	3 <	4	35	106 <
17:15	2	18 <	1	2	23	103
17:30	1	4	6	1	12	95
17:45	1	5	0	2	8	78
18:00	0	3	0	2	5	48

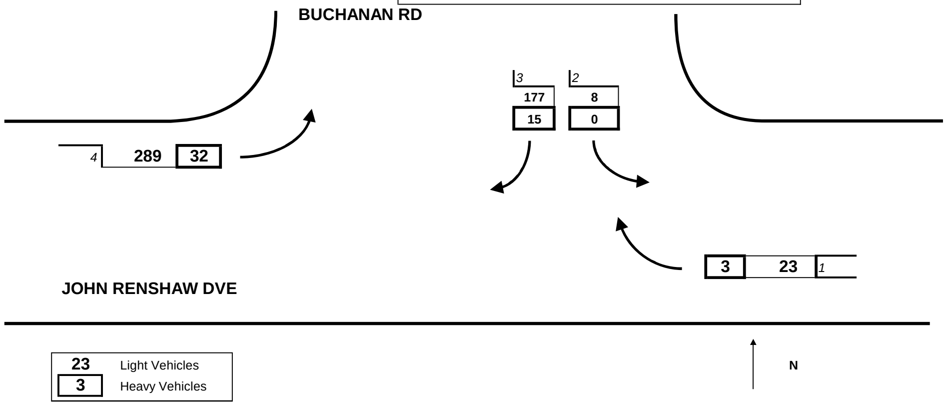
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

9/2/2012 - JOHN RENSHAW DVE / BUCHANAN RD, BUCHANAN

8:45 <<< HOUR ENDING **Thursday**

Summary:
JOHN RENSHAW DVE / BUCHANAN RD
328 **Total Light Vehicles**
50 **Total Heavy Vehicles**

Quality Surveys



9/2/2012 - JOHN RENSHAW DVE / BUCHANAN RD, BUCHANAN

Light Vehicles / **Total Vehicles**

	1	2	3	4	15 MIN	HOUR
06:15	2	1	19	14	36	
06:30	6	1	40	30	77	
06:45	8	3	34	46	91	
07:00	6	2	28	43	79	283
07:15	3	2	18	36	59	306
07:30	5	2	38	39	84	313
07:45	3	4	38	41	86	308
08:00	3	3	51	84	141	370
08:15	10	3	42	58	113	424
08:30	6	1	43	86	136	476
08:45	4	1	41 <	61 <	107	497 <
09:00	5 <	8 <	41	56	110	466

Heavy Vehicles / **Total Vehicles**

	1	2	3	4	15 MIN	HOUR
06:15	0	1	0	0	1	
06:30	0	0	2	0	2	
06:45	2	0	2	4	8	
07:00	2	1 <	4	2	9	20
07:15	2 <	0	2	1	5	24
07:30	0 <	0	2	2	4	26
07:45	0	0	3	5	8	26
08:00	0	0	2	8	10	27
08:15	0	0	3	5	8	30
08:30	2	0	4	9	15	41
08:45	1	0	6	10 <	17	50 <
09:00	0	1	3 <	3	7	47

All Vehicles / **Total Vehicles**

	1	2	3	4	15 MIN	HOUR
06:15	2	2	19	14	37	
06:30	6	1	42	30	79	
06:45	10	3	36	50	99	
07:00	8	3	32	45	88	303
07:15	5 <	2	20	37	64	330
07:30	5	2	40	41	88	339
07:45	3	4	41	46	94	334
08:00	3	3	53	92	151	397
08:15	10	3	45	63	121	454
08:30	8	1	47	95	151	517
08:45	5	1	47 <	71 <	124	547 <
09:00	5	9 <	44	59	117	513

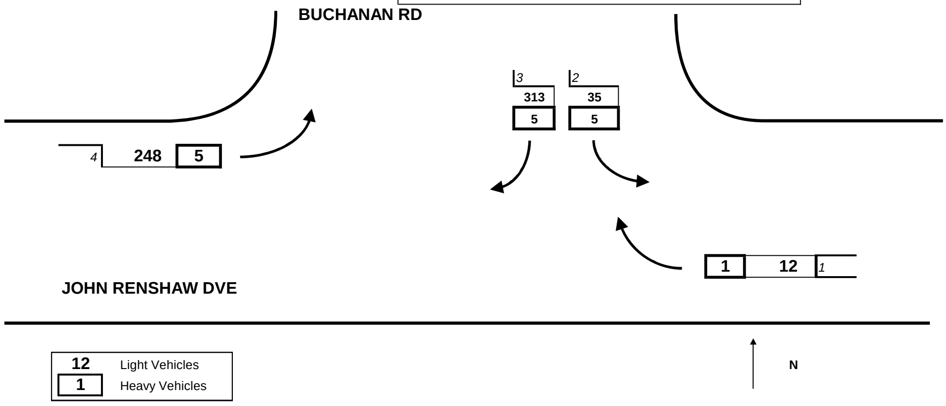
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

9/2/2012 - JOHN RENSHAW DVE / BUCHANAN RD, BUCHANAN

17:45 <<< HOUR ENDING   Thursday

Summary:
JOHN RENSHAW DVE / BUCHANAN RD
330 Total Light Vehicles
16 Total Heavy Vehicles

Quality Surveys



9/2/2012 - JOHN RENSHAW DVE / BUCHANAN RD, BUCHANAN

Light Vehicles

	1	2	3	4	Total Vehicles 15 MIN	HOUR
15:15	1	2	30	24	57	
15:30	0	4	57	42	103	
15:45	4	2	48	83	137	
16:00	1	9	55	67	132	429
16:15	12	3	58	88	161	533
16:30	5 <	5	74	53 <	137	567
16:45	0	3	81	57	141	571
17:00	1	5	77	52	135	574
17:15	5	5	72	72	154	567
17:30	3	19	86 <	61	169	599
17:45	3	6 <	78	63	150	608 <
18:00	6	5 <	60	63	134	607

Heavy Vehicles

	1	2	3	4	Total Vehicles 15 MIN	HOUR
15:15	1	0	2	1	4	
15:30	3	2	7	4	16	
15:45	2	1	3	1	7	
16:00	2	3	2	3	10	37
16:15	2 <	1	4 <	2 <	9	42 <
16:30	3 <	0	2	4 <	9	35
16:45	1	3	1	0	5	33
17:00	1	2	3	3	9	32
17:15	0	1	0	1	2	25
17:30	0	2 <	2	1	5	21
17:45	0	0	0	0	0	16
18:00	0	0	0	0	0	7

All Vehicles

	1	2	3	4	Total Vehicles 15 MIN	HOUR
15:15	2	2	32	25	61	
15:30	3	6	64	46	119	
15:45	6	3	51	84	144	
16:00	3	12	57	70	142	466
16:15	14	4	62	90	170	575
16:30	8 <	5	76	57 <	146	602
16:45	1	6	82	57	146	604
17:00	2	7	80	55	144	606
17:15	5	6	72	73	156	592
17:30	3	21 <	88 <	62	174	620
17:45	3	6 <	78	63	150	624 <
18:00	6	5	60	63	134	614

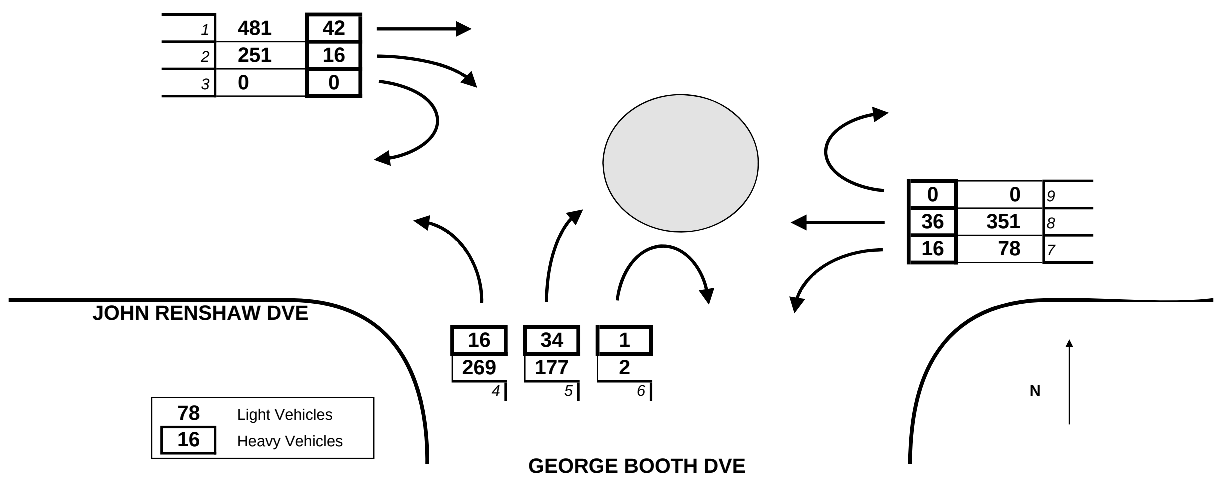
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

9/2/2012 - JOHN RENSHAW DVE / GEORGE BOOTH DVE, BUCHANAN

8:15 <<< HOUR ENDING **Thursday**

Summary:
JOHN RENSHAW DVE / GEORGE BOOTH DVE
1609 Total Light Vehicles
161 Total Heavy Vehicles

Quality Surveys



9/2/2012 - JOHN RENSHAW DVE / GEORGE BOOTH DVE, BUCHANAN

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
06:15	79	23	0	49	19	0	15	101	0	285	
06:30	121	60	0	102	30	0	34	94	0	441	
06:45	147	51	0	83	36	0	26	105	0	448	
07:00	109	50	0	91	34	0	22	80	0	386	1560
07:15	104	53	0	61 <	22	0	26 <	50	0	316	1591
07:30	138 <	66	0	65	40	0	20	83	0	412	1562
07:45	111	77	0	76	40	1	17	92	0	414	1528
08:00	138	50	0	64	46	1 <	17	87	0	403	1545
08:15	94	58 <	0	64	51	0 <	24	89 <	0	380	1609 <
08:30	148	41	0	57	45 <	0 <	20	73	0	384	1581
08:45	110	47	0	85	35	0	25	98	0	400	1567
09:00	99	34	0	62	25	0	22	70	0	312	1476

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
06:15	4	11	0	4	0	0	0	8	0	26	
06:30	6	5	0	4	0	0	7	5	0	27	
06:45	5	1	0	6	4	0	7	18	0	41	
07:00	9	6	0	3	3	0	3	10	0	34	128
07:15	8	2	0	14	7	0	4 <	6	0	41	143
07:30	10	4	0	3	8	1 <	4	3	0	33	149
07:45	11	5 <	0	7	11	0 <	2	12	0	48	156
08:00	12	6 <	0	2	9 <	0 <	9	10	0	48	170
08:15	9	1	0	4	6	0 <	1	11	0	32	161
08:30	13 <	4	0	8	4	0	6	19	0	54	182 <
08:45	11 <	2	0	6	9	0	3	15 <	0	46	180
09:00	8	10 <	0	12 <	1	0	3	9	2 <	45	177

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
06:15	83	34	0	53	19	0	15	109	0	311	
06:30	127	65	0	106	30	0	41	99	0	468	
06:45	152	52	0	89	40	0	33	123	0	489	
07:00	118	56	0	94	37	0	25	90	0	420	1688
07:15	112	55	0	75 <	29	0	30 <	56	0	357	1734
07:30	148	70	0	68	48	1	24	86	0	445	1711
07:45	122	82	0	83	51	1	19	104	0	462	1684
08:00	150	56	0	66	55	1 <	26	97	0	451	1715
08:15	103	59 <	0	68	57	0 <	25	100	0	412	1770 <
08:30	161 <	45	0	65	49 <	0	26	92	0	438	1763
08:45	121	49	0	91	44	0	28	113 <	0	446	1747
09:00	107	44	0	74	26	0	25	79	2 <	357	1653

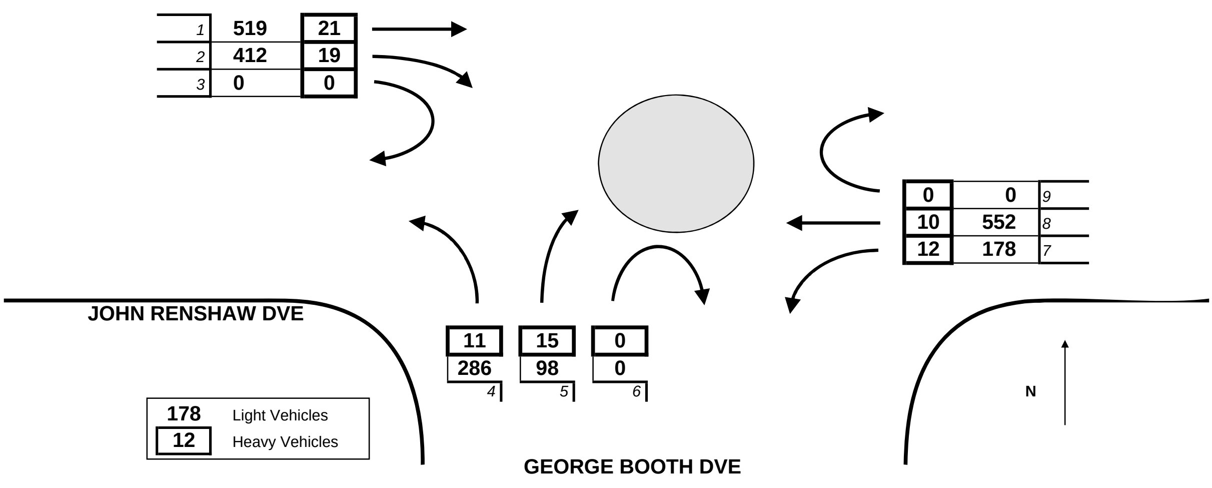
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

9/2/2012 - JOHN RENSHAW DVE / GEORGE BOOTH DVE, BUCHANAN

17:45 <<< HOUR ENDING **Thursday**

Summary:
JOHN RENSHAW DVE / GEORGE BOOTH DVE
2045 Total Light Vehicles
88 Total Heavy Vehicles

Quality Surveys



9/2/2012 - JOHN RENSHAW DVE / GEORGE BOOTH DVE, BUCHANAN

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
15:15	97	59	0	37	13	0	17	100	1	324	
15:30	91	80	0	36	9	0	37	112	1	366	
15:45	116	74	0	49	24	0	32	112	0	407	
16:00	134	83	0	70	25	1	29	146	0 <	488	1585
16:15	142	74	1 <	53	21	2	32	150	0	475	1736
16:30	103	101	0 <	46	20	1 <	33	146	1	451	1821
16:45	133	80	0 <	44	22	0 <	45	134 <	0	458	1872
17:00	113	106	0 <	69	22	0	36	135	0	481	1865
17:15	137	103	0	77	23	0	42	120	0	502	1892
17:30	136 <	106	0	67	25	0	56 <	157	0	547	1988
17:45	133 <	97 <	0	73	28	0	44	140	0	515	2045 <
18:00	108	84	0	70 <	32 <	0	24	116	0	434	1998

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
15:15	10	6	0	3	7	0	6	13	0	45	
15:30	10	9	0	1	5	0	1	7	1	34	
15:45	8	4	0	1	5	0	1	9	1	29	
16:00	6	8	0	1	2 <	0	2	9	0 <	28	136
16:15	10	7 <	0	1	4	0	5	16 <	0 <	43	134
16:30	12	3	0	4	4	0	9	7 <	0	39	139 <
16:45	8	3	0	2	1	0	2	7	0	23	133
17:00	9 <	4	0	4	6	0	4 <	0	0	27	132
17:15	7	3	0	2 <	2	0	1	4	0	19	108
17:30	3	3	0	4 <	4	0	4	5	0	23	92
17:45	2	9	0	1	3	0	3	1	0	19	88
18:00	7	2	0	0	3	0	1	2	0	15	76

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
15:15	107	65	0	40	20	0	23	113	1	369	
15:30	101	89	0	37	14	0	38	119	2	400	
15:45	124	78	0	50	29	0	33	121	1	436	
16:00	140	91	0	71	27	1	31	155	0 <	516	1721
16:15	152	81	1 <	54	25	2	37	166	0	518	1870
16:30	115	104	0 <	50	24	1 <	42	153	1	490	1960
16:45	141 <	83	0 <	46	23	0 <	47	141 <	0	481	2005
17:00	122	110	0 <	73	28	0	40	135	0	508	1997
17:15	144	106	0	79	25	0	43	124	0	521	2000
17:30	139	109	0	71	29	0	60 <	162	0	570	2080
17:45	135	106 <	0	74 <	31	0	47 <	141	0	534	2133 <
18:00	115	86	0	70	35 <	0	25	118	0	449	2074

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

Attachment C. Project Traffic Scenarios

The tables which follow present the components of the traffic generation of Tasman for the three future scenarios presented in this report. It is noted that "Delivery" referred to in the tables includes vehicle trips generated by visitors as well as by deliveries, and "Works" refers to both construction and decommissioning activities.

Year 2013 Daily Tasman Underground Mine Project Traffic (veh/day)

Road and Location	Heavy Vehicles				Light Vehicles				Total
	Coal Haulage	Operational Delivery	Works Delivery	Waste Rock Transport	Operational Employees	Operational Delivery	Works Employees	Works Delivery	
Average Weekday									
Tasman Mine Access									
Existing	118	24	0	0	154	96	0	0	392
New	0	0	33	118	0	0	40	32	223
George Booth Drive									
South of Existing Mine Access	0	17	23	0	116	67	30	22	275
North of Existing Mine Access	118	8	23	0	38	28	30	22	267
North of New Mine Access	118	8	10	118	38	28	10	10	340
John Renshaw Drive									
East of Donaldson Access	0	3	4	0	8	9	2	3	29
West of Donaldson Access	118	3	4	118	8	9	2	3	265
Saturday									
Tasman Mine Access									
Existing	0	0	0	0	96	0	0	0	96
New	0	0	0	0	0	0	0	0	0
George Booth Drive									
South of Existing Mine Access	0	0	0	0	73	0	0	0	73
North of Existing Mine Access	0	0	0	0	23	0	0	0	23
North of New Mine Access	0	0	0	0	23	0	0	0	23
John Renshaw Drive									
East of Donaldson Access	0	0	0	0	5	0	0	0	5
West of Donaldson Access	0	0	0	0	5	0	0	0	5

Year 2017 Daily Tasman Underground Mine Project Traffic (veh/day)

Road and Location	Heavy Vehicles				Light Vehicles				Total
	Coal Haulage	Operational Delivery	Works Delivery	Waste Rock Transport	Operational Employees	Operational Delivery	Works Employees	Works Delivery	
Average Weekday									
Tasman Mine Access									
Existing	0	0	15	0	0	0	40	15	70
New	356	36	0	0	212	144	0	0	748
George Booth Drive									
South of Existing Mine Access	0	25	10	0	161	101	30	11	338
North of Existing Mine Access	0	25	5	0	161	101	10	4	306
North of New Mine Access	356	11	5	0	51	43	10	4	480
John Renshaw Drive									
East of Donaldson Access	0	4	2	0	11	14	2	1	34
West of Donaldson Access	356	4	2	0	11	14	2	1	390
Saturday									
Tasman Mine Access									
Existing	0	0	0	0	0	0	0	0	0
New	100	0	0	0	96	0	0	0	196
George Booth Drive									
South of Existing Mine Access	0	0	0	0	73	0	0	0	73
North of Existing Mine Access	0	0	0	0	73	0	0	0	73
North of New Mine Access	100	0	0	0	23	0	0	0	123
John Renshaw Drive					0				
East of Donaldson Access	0	0	0	0	5	0	0	0	5
West of Donaldson Access	100	0	0	0	5	0	0	0	105

Year 2029 Daily Tasman Underground Mine Project Traffic (veh/day)

Road and Location	Heavy Vehicles				Light Vehicles				Total
	Coal Haulage	Operational Delivery	Works Delivery	Waste Rock Transport	Operational Employees	Operational Delivery	Works Employees	Works Delivery	
Average Weekday									
Tasman Mine Access									
Existing	0	0	0	0	0	0	0	0	0
New	356	36	0	0	212	144	0	0	748
George Booth Drive									
South of Existing Mine Access	0	25	0	0	161	101	0	0	287
North of Existing Mine Access	0	25	0	0	161	101	0	0	287
North of New Mine Access	356	11	0	0	51	43	0	0	461
John Renshaw Drive									
East of Donaldson Access	0	4	0	0	11	14	0	0	29
West of Donaldson Access	356	4	0	0	11	14	0	0	385
Saturday									
Tasman Mine Access									
Existing	0	0	0	0	0	0	0	0	0
New	100	0	0	0	96	0	0	0	196
George Booth Drive									
South of Existing Mine Access	0	0	0	0	73	0	0	0	73
North of Existing Mine Access	0	0	0	0	73	0	0	0	73
North of New Mine Access	100	0	0	0	23	0	0	0	123
John Renshaw Drive									
East of Donaldson Access	0	0	0	0	5	0	0	0	5
West of Donaldson Access	100	0	0	0	5	0	0	0	105

Weekday On-Street Peak Hour Tasman Underground Mine Project Traffic at Maximum Haulage (veh/day)

	Heavy Vehicles				Light Vehicles				Total
	Coal Haulage	Operational Delivery	Works Delivery	Waste Rock Transport	Operational Employees	Operational Delivery	Works Employees	Works Delivery	
Year 2011									
Daily	236	24	-	-	154	96	-	-	510
6.00 to 7.00am[A]	24	5	-	-	28	0	-	-	57
4.00 to 5.00pm	24	0	-	-	17	5	-	-	46
Year 2013									
Daily	118	24	33	118	154	96	40	32	615
6.00 to 7.00am[A]	12	5	7	12	28	0	7	0	71
4.00 to 5.00pm	12	0	0	12	17	5	4	2	53
Year 2017									
Daily	356	36	15	0	212	144	40	15	818
6.00 to 7.00am[A]	40	8	3	0	38	0	7	0	96
4.00 to 5.00pm	40	0	0	0	24	8	4	1	77
Year 2029									
Daily	356	36	0	0	212	144	0	0	748
6.00 to 7.00am[A]	40	8	0	0	38	0	0	0	86
4.00 to 5.00pm	40	0	0	0	24	8	0	0	72

Assumptions:

- Maximum coal haulage (including waste rock haulage in 2013) is 12 loaded trucks per hour, increases to 20 loaded trucks per hour after 2013, with loaded trucks matched by empty trucks returning.
- [A]Coal and waste rock haulage would not commence until 7am, but is conservatively included in the 6-7am forecast volume. Waste rock haulage is assumed to follow same distribution through the day as coal haulage (note maximum haulage rate applies to combination of waste rock and coal haulage trips).
- Peak hour to daily ratio remains constant for employee and delivery trips.
- Construction employee and delivery traffic assumed to be spread through the day according to operational employee and delivery distribution.

Average Weekday Future Peak Hour Midblock Levels of Service No Project

	Capacity (vehicles per hour)	Volume (veh/hr)	V/C Ratio	Level of Service
Year 2013 AM Peak				
Existing Mine Access	1,489	45	0.03	A
George Booth Drive	2,399	891	0.37	C/D
John Renshaw Drive	2,875	930	0.32	C
Year 2013 PM Peak				
Existing Mine Access	1,566	35	0.02	A
George Booth Drive	2,633	1,026	0.39	D
John Renshaw Drive	2,917	1,031	0.35	C
Year 2017 AM Peak				
Existing Mine Access	1,489	45	0.03	A
George Booth Drive	1,951	100	0.05	A
John Renshaw Drive	2,879	1,264	0.44	D
Year 2017 PM Peak				
Existing Mine Access	1,566	35	0.02	A
George Booth Drive	2,162	110	0.05	A
John Renshaw Drive	2,921	1,402	0.48	D
Year 2029 AM Peak				
George Booth Drive	2,471	9	0.00	A
John Renshaw Drive	2,904	2,478	0.85	E
Year 2029 PM Peak				
George Booth Drive	2,704	11	0.00	A
John Renshaw Drive	2,943	2,754	0.94	E

Average Weekday Future Peak Hour Midblock Levels of Service with Project

	Capacity (vehicles per hour)	Volume (veh/hr)	V/C Ratio	Level of Service
Year 2013 AM Peak				
Existing Mine Access	1,489	45	0.03	A
New Mine Access	1,006	26	0.03	A
George Booth Drive	2,328	907	0.39	D
John Renshaw Drive	2,844	943	0.33	C
Year 2013 PM Peak				
Existing Mine Access	1,566	35	0.02	A
New Mine Access	1,076	18	0.02	A
George Booth Drive	2,566	1,040	0.41	D
John Renshaw Drive	2,890	1,044	0.36	C
Year 2017 AM Peak				
Existing Mine Access	1,650	11	0.01	A
New Mine Access	1,200	86	0.07	A
George Booth Drive	1,490	134	0.09	A
John Renshaw Drive	2,829	1,293	0.46	D
Year 2017 PM Peak				
Existing Mine Access	3,200	5	0.00	A
New Mine Access	1,196	72	0.06	A
George Booth Drive	1,628	142	0.09	A
John Renshaw Drive	2,874	1,431	0.50	D
Year 2029 AM Peak				
New Mine Access	1,200	86	0.07	A
George Booth Drive	1,020	61	0.06	A
John Renshaw Drive	2,866	2,521	0.88	E
Year 2029 PM Peak				
New Mine Access	1,196	72	0.06	A
George Booth Drive	1,040	59	0.06	A
John Renshaw Drive	2,908	2,796	0.96	E