



APPENDIX H

Road Transport Assessment



Dendrobium Mine Extension Project Road Transport Assessment

Prepared for:

Illawarra Metallurgical Coal

23 March 2022

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Dendrobium Mine Extension Project

Road Transport Assessment

Client: Illawarra Metallurgical Coal

Version: Draft 05

Date: 23 March 2022

TPP Reference: 21149

Quality Record

Version	Date	Prepared by	Approved by	Signature
Final	23/03/2022	PJD	PJD	<i>P Dalton</i>

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1 Introduction

This Road Transport Assessment report has been prepared to accompany an application for Infrastructure Approval for the Dendrobium Mine Extension Project (the Project). The Dendrobium Mine is an underground coal mine situated in the Southern Coalfield of New South Wales (NSW) approximately 8 kilometres (km) west of Wollongong (Figure 1.1).

Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]), a wholly owned subsidiary of South32 Limited (South32), is the owner and operator of the Dendrobium Mine.

Development Consent DA 60-03-2001 for the Dendrobium Mine was granted by the NSW Minister for Urban Affairs and Planning under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) in November 2001. The Dendrobium Mine extracts coal from the Wongawilli Seam (also known as the No 3 Seam) within Consolidated Coal Lease (CCL) 768 using underground longwall mining methods. The Dendrobium Mine includes five approved underground mining domains, named Areas 1, 2, 3A, 3B and 3C. Longwall mining is currently being undertaken in Area 3B, with extraction largely complete in Areas 1, 2 and 3A (Figure 1.1). The Dendrobium Mine has an approved operational capacity of up to 5.2 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until 31 December 2030.

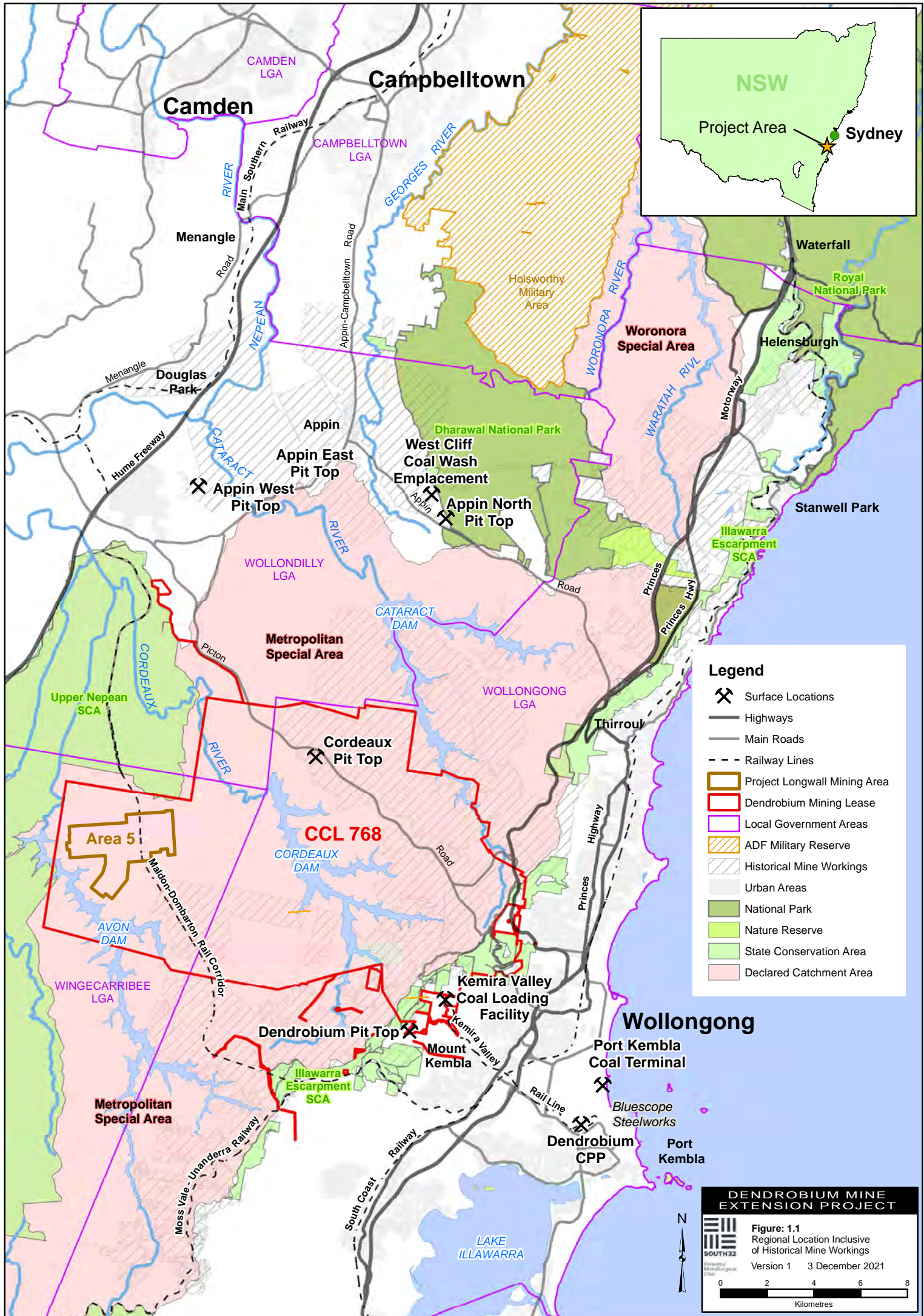
The Project would support the extraction of approximately 31 million tonnes of ROM coal from Area 5 (Figure 1.2), within CCL 768. The life of the Project includes longwall mining in Area 5 up to approximately 31 December 2034, and ongoing use of existing surface facilities (including for the handling of Area 3C ROM coal) until 2041¹.

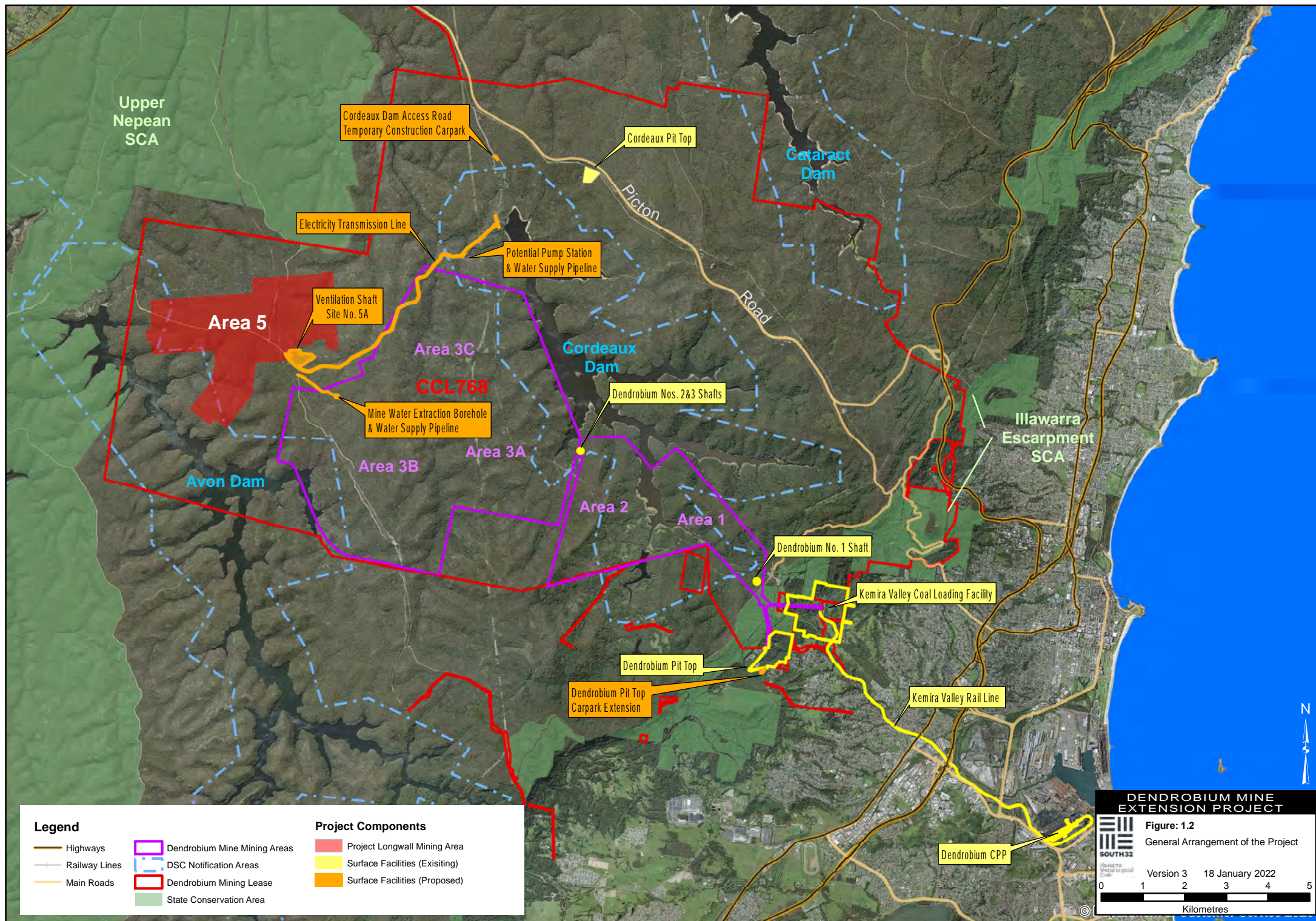
This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) relating to the road transport environment. Inputs to the SEARs from authorities relevant to the road transport environment have also been considered in the preparation of this assessment. The coverage of the relevant SEARs is set out in Table 1.1.

Table 1.1: Coverage of SEARs Relevant to the Road Transport Environment

Coverage of SEARs	Relevant Section(s)
10. Transport - including:	
<ul style="list-style-type: none"> an assessment of the likely transport impacts of the development on the capacity, condition, safety and efficiency of the surrounding transport network, and any required upgrades or operational measures to minimise transport impacts; 	Section 6
<ul style="list-style-type: none"> details of how the development would interact with the Maldon to Dombarton rail corridor and an assessment of the risks to rail assets and the future operational capacity of the corridor from mining operations, undertaken in consultation with the asset owners. 	Section 4.8

¹ The Project does not include approved underground mining operations in the Wongawilli Seam in Areas 1, 2, 3A, 3B and 3C at the Dendrobium Mine and associated surface activities (such as monitoring and remediation). These activities will continue to operate in accordance with Development Consent DA 60-03-2001 (as modified).





The remainder of this report is set out as follows:

- Section 2 describes the existing operating conditions at the Dendrobium Mine.
- Section 3 describes the proposed Project.
- Section 4 assesses the existing road transport environment in the vicinity of the Project, including the road network, historic and current traffic volumes, and road safety history of relevant routes. The existing traffic generated by Dendrobium Mine on the road network is quantified and the implications of the proposed Project on the traffic generated by the Dendrobium Mine during construction activity and during ongoing operational activity is reviewed.
- Section 5 assesses the future road environment with the Project and other background changes to traffic conditions, including future intersection operating conditions, roadway capacity, and road safety. It identifies mitigation measures to satisfactorily accommodate the future traffic demands.
- Section 6 assesses the potential impacts associated with the Project.
- Section 7 presents a summary of the investigation, and its conclusions.

2 Dendrobium Mine

The Dendrobium Mine is located in the Southern Coalfield of NSW, approximately 8 km west of Wollongong, in the vicinity of Mount Kembla Village (Figure 1.1). It is located within the Wollongong City Council, Wingecarribee Shire Council and Wollondilly Shire Council Local Government Areas.

Existing approvals relating to the Dendrobium Mine include Development Consent DA 60-03-2001 (as modified) issued under the EP&A Act, Approval Decision (EPBC 2001/214) issued under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, and CCL 768 issued under the NSW *Mining Act 1992*.

Construction of the Dendrobium Mine commenced in January 2002, with longwall mining commencing in April 2005. Five areas are approved for underground mining, named Areas 1, 2, 3A, 3B and 3C. Longwall mining is currently being undertaken in Area 3B, with extraction being largely complete in Areas 1, 2 and 3A. Monitoring and remediation/rehabilitation activities continue to be undertaken by IMC in previous mining areas.

Existing surface facilities for the Dendrobium Mine include:

- the Dendrobium Pit Top;
- Kemira Valley Coal Loading Facility;
- Kemira Valley Rail Line;
- Dendrobium Coal Preparation Plant (CPP), located within the Port Kembla Steelworks precinct; and
- Dendrobium Shaft Numbers 1, 2 and 3.

The Dendrobium Mine currently extracts coal from the Wongawilli Seam within Area 3, with an approved operational capacity of up to 5.2 Mtpa of ROM coal. The approved life of the Dendrobium Mine under Development Consent DA 60-03-2001 is to 31 December 2030.

ROM coal is transported from underground workings to the Kemira Valley Coal Loading Facility via an underground conveyor network reaching the surface via the Kemira Valley tunnel. Coal is then sized and stockpiled at the Kemira Valley Coal Loading Facility prior to transport by train to the Dendrobium CPP within the Port Kembla Steelworks via the Kemira Valley Rail Line.

ROM coal from the Dendrobium Mine is processed at the Dendrobium CPP, which is located within the Port Kembla Steelworks precinct. Product coal is delivered from the Dendrobium CPP to the Port Kembla Steelworks or Port Kembla Coal Terminal (PKCT) for transport to Liberty Primary Steel Whyalla Steelworks or export. Coal wash is transported by road from the Dendrobium CPP to the West Cliff Colliery Coal Wash Emplacement. Coal wash is also supplied to third parties as an engineering fill material or for other beneficial uses.

The Dendrobium Mine operates on a continuous basis (24 hours per day, seven days per week). Trains travelling between the Kemira Valley Coal Loading Facility and Dendrobium CPP along the Kemira Valley Rail Line do not travel between 11 pm and 6 am, unless written approval is obtained from the Environment Protection Authority (EPA) for emergency use of the rail line. Heavy vehicle access to and from some surface facilities is restricted to specific hours as per the Drivers Code of Conduct (Section 2.5).

2.1 Dendrobium Pit Top

2.1.1 Location and Access

The Dendrobium Pit Top Access is off Cordeaux Road, approximately 4.9 km from the Princes Highway. This is the main site access used by employees, contractors, visitors and delivery vehicles associated with the Dendrobium Mine activity.

The intersection of Cordeaux Road with the Dendrobium Pit Top Access is a T-intersection with no auxiliary storage or turn lanes. At the intersection, the access road is very wide, and the road to the main car park lies at an acute angle to Cordeaux Road, rather than within the preferred range of 70 to 90 degrees. The impact of this alignment has been mitigated by providing a painted median and kerb extensions to assist drivers to align their vehicle when turning into or out of Cordeaux Road. Sight distance at the intersection is satisfactory for both entering and exiting vehicles. Exiting vehicles are controlled with a "STOP" sign and delineation.

2.1.2 Workforce

The Dendrobium Mine currently employs or contracts approximately 500 personnel at the Dendrobium Pit Top, including underground workers, surface staff, warehouse and workshop staff. The current roster and shift arrangements for the underground workforce, which makes up the majority of the workforce at the Dendrobium Pit Top, are summarised in Table 2.1.

Table 2.1: Underground Operational Shifts at Dendrobium Pit Top

	Personnel Present			Start Time	End Time
	Employees	Contractors	Total		
Weekdays (Monday to Thursday)					
Day Shift	62	58	120	6:00 am	4:00 pm
Afternoon Shift	45	55	100	2:00 pm	12:00 am
Night Shift	40	60	100	10:00 pm	8:00 am
Weekend (Friday to Sunday)					
Day Shift	42	43	85	6:00 am	6:00 pm
Night Shift	45	35	80	8:00 pm	8:00 am

The primary contracting company transports workers to and from the Dendrobium Pit Top using 22-seat Coaster buses. The buses travel to the Dendrobium Pit Top from a site on Marley Place at Unanderra, where car parking, shower and locker facilities are provided for those workers. Two buses are used per shift across both weekdays and weekends, transporting up to 42 contractors per shift.

2.1.3 Deliveries and Visitors

On average, the Dendrobium Pit Top receives approximately 20 deliveries per day. Deliveries are generally made by either rigid trucks or semitrailers. Deliveries by heavy vehicles must occur within the allowable times specified in the Drivers' Code of Conduct (Section 2.5).

The number of visitors to the Dendrobium Mine varies from day to day. Based on review of one month of sign-in data at the Dendrobium Pit Top from 2017, there is an average of four visitors per day. The data indicate that on many days however, there are no visitors. On the days during which there were visitors to the Dendrobium Pit Top, there was an average of 11 to 12 visitors per day.

2.2 Kemira Valley Coal Loading Facility

2.2.1 Location and Access

The Kemira Valley Coal Loading Facility is used by a limited number of employees, visitors and delivery vehicles, and is accessed from Stones Road.

The Kemira Valley Coal Loading Facility Access extends northwards from Stones Road, and contains a number of one lane sections that require drivers to stop and give way to traffic in the opposing direction. Signage relating to these requirements includes a standard "STOP" sign, a non-standard sign stating "STOP & LOOK ONE LANE CARRIAGEWAY NO OVERTAKING OR PASSING ENTERING TRAFFIC HAS RIGHT OF WAY" as well as an advisory speed sign for trucks of 40 kilometres per hour (km/h).

2.2.2 Workforce

The Kemira Valley Coal Loading Facility is used by a limited number of employees, being primarily equipment operators and site supervisors.

2.2.3 Deliveries and Visitors

Medium to heavy vehicles require access to the site to transport equipment and materials (approximately three deliveries on a typical day). Vehicles also regularly access the site for maintenance and environmental monitoring.

2.3 Dendrobium CPP

The Dendrobium CPP is located within the Port Kembla Steelworks precinct, and is accessed via an intersection on the northern side of Flinders Street.

The Dendrobium CPP operates 24 hours per day and seven days per week, with some 14 employees and up to seven contractors during normal operations. The workforce operates rotating 12-hour shifts (7.00 am to 7.00 pm and 7.00 pm to 7.00 am), and car parking is provided on site for the employees. The Dendrobium CPP attracts very few visitors.

There are occasional shutdown periods at the Dendrobium CPP to undertake maintenance activities. During these limited periods of up to three weeks duration on an annual basis, production is ceased, and a shutdown maintenance workforce of approximately 200 contractors is temporarily required at the Dendrobium CPP.

Coal wash haulage between the Dendrobium CPP and West Cliff Coal Wash Emplacement is currently undertaken by haul trucks operating under the Appin Mine Project (Bulli Seam Operations Project Approval 08_0150), which permits this haulage activity until the end of the Appin Mine in 2041.

The Dendrobium CPP Access intersects with Flinders Street, Port Kembla at a T-intersection approximately 600 metres (m) from Five Islands Road. The intersection has a single approach and single departure lane on each approach, and vehicles exiting the access road are controlled with a "STOP" sign and pavement marking. The access road has a posted speed limit of 40 km/h and Flinders Street has a speed limit of 60 km/h. This employee access road to the Dendrobium CPP also services batteries and gas processing facilities unrelated to the Dendrobium Mine.

There is limited interaction between heavy vehicles associated with IMC's operations and BlueScope Steel Limited's (BlueScope Steel) operations on the shared BlueScope Steel access road.

2.4 Shaft Numbers 1, 2 and 3

The existing Dendrobium Shaft Sites are primarily unattended sites, with access generally occurring intermittently up to several times a week primarily for maintenance inspections or for specific maintenance or upgrade works.

2.5 Traffic Management Plan

The Dendrobium Mine Traffic Management Plan (TMP) (Illawarra Coal, 2021) addresses the management of road traffic and rail movements associated with the operation of the Dendrobium Mine and associated infrastructure, and aims to:

- *Ensure compliance with Development Consent conditions and any undertakings made by South32 to the community with respect to traffic management;*
- *Ensure that South32's policies and internal company requirements are met with respect to traffic management;*
- *Minimise the potential for traffic conflict and/or personal injury resulting from traffic generated by the Dendrobium Mine;*
- *Create a road environment where all road users feel safe; and*
- *Successfully enforce a Drivers' Code of Conduct for all personnel associated with Dendrobium, including a monitoring and reporting process.*

The Dendrobium Drivers' Code of Conduct aims to:

minimise the impacts of traffic associated with the Dendrobium Mine on local residents by reducing noise and limiting traffic, resulting in a safer traffic environment for everyone.

The Code of Conduct prohibits access to and from the Dendrobium Pit Top, Kemira Valley Coal Loading Facility and Dendrobium Shaft Number 1 by vehicles other than personnel passenger vehicles during specific hours. Allowable travel times for vehicles other than personnel passenger vehicles are:

- Monday to Friday 7:00 am to 8:00 am;
- Monday to Friday 9:30 am to 2:30 pm;
- Monday to Friday 4:00 pm to 5:00 pm; and
- Saturdays 8:00 am to 1:00 pm.

A 24-hour community call line is in place for residents to report breaches of the TMP or Drivers' Code of Conduct. All complaints are investigated, disciplinary action may be taken, and penalties issued (donation to a charity) for non-compliance. IMC's records of complaints made by members of the community indicate that over FY2020 and FY2021, 27 complaints were made regarding traffic issues, of which, 19 were made by one member of the community and the remaining eight were made by six individual community members.

The Transport Planning Partnership (TPPP) has reviewed the complaints recorded over the six months from January to June 2021, over which time, 12 complaints were received with respect to mine-related traffic on the public road network. These are broadly identified as follows:

- Six complaints related to potentially speeding heavy vehicles on Cordeaux Road. In most cases, the vehicle and driver were able to be identified, however, speeds could not be verified as the trucks were not fitted with a GPS tracking system. One of the contractor's fleet is being upgraded to have tracking systems installed.

- Three complaints related to heavy vehicle movements outside of the allowable times, with the following noted:
 - the driver did not usually deliver to the Dendrobium Mine and was unaware of the Drivers' Code of Conduct;
 - the driver waited outside the village until the allowable time however the truck clock was incorrect; and
 - the exit boom gate opened automatically when the truck approached to exit, rather than the driver manually requesting that it be opened. An additional control was installed on the boom gate to prevent a recurrence.
- Two complaints related to vehicles parked on Cordeaux Road. In each case, staff attempted to find the driver and have the vehicle removed, and a reminder on parking protocol was issued to all staff.
- One complaint related to damage caused by a truck turning from Stones Road to Cordeaux Road. The truck company was contacted about the incident, and the damage repaired the following day.

2.6 Cordeaux Pit Top

The Cordeaux Pit Top is not currently part of the existing Dendrobium Mine, but is used to support IMC operations such as exploration, survey and environmental monitoring. The Cordeaux Pit Top is associated with the Cordeaux Colliery, which is a non-producing IMC mine under care and maintenance. The Cordeaux Pit Top entry is located off Picton Road approximately 11 km from its intersection with Mount Ousley Road. The Cordeaux Pit Top is used by approximately 70 employees, visitors and deliveries.

3 Dendrobium Mine Extension Project

3.1 Project Description

The Project would include the following activities:

- longwall mining of the Bulli Seam in a new underground mining area (Area 5);
- development of underground roadways existing Dendrobium Mine underground areas (namely Area 3) to Area 5;
- use of existing Dendrobium Mine underground roadways and drifts for personnel and materials access, ventilation, dewatering and other ancillary activities related to Area 5;
- development of new surface infrastructure associated with mine ventilation, gas management and abatement, water management and other ancillary infrastructure;
- handling and processing of up to 5.2 Mtpa of ROM coal;
- extension of underground mining operations within Area 5 until approximately 2035;
- use of the existing Dendrobium Pit Top, Kemira Valley Coal Loading Facility, Dendrobium CPP and Dendrobium Shafts with minor upgrades and extensions to 2041;
- transport of sized ROM coal from the Kemira Valley Coal Loading Facility to the Dendrobium CPP via the Kemira Valley Rail Line;
- handling and processing of coal from the Dendrobium Mine (including the Project) and IMC's Appin Mine (if required) at the Dendrobium CPP to 2041;
- delivery of product coal from the Dendrobium CPP to the Port Kembla Steelworks for domestic use or to the PKCT for transport to Liberty Primary Steel Whyalla Steelworks or export;
- transport of coal wash by road to customers for engineering purposes (e.g. civil construction fill), for other beneficial uses and/or for emplacement at the West Cliff Stage 3 and Stage 4 Coal Wash Emplacement;
- development and rehabilitation of the West Cliff Stage 3 Coal Wash Emplacement (noting that opportunities for beneficial use of coal wash would be maximised);
- continued use of the Cordeaux Pit Top for mining support activities such as exploration, environmental monitoring, survey, rehabilitation, administration and other ancillary activities;
- progressive development of sumps, pumps, pipelines, water storages and other water management infrastructure;
- controlled release of excess water in accordance with the conditions of Environment Protection Licence 3241 and/or beneficial use;

- monitoring, rehabilitation and remediation of subsidence and other mining effects; and
- other associated infrastructure, plant, equipment and activities.

Project construction activity would require a short term workforce of approximately 100 Full Time Equivalent (FTE) workers, made up of the following:

- 40 construction workers based at Shaft Site No. 5A;
- 40 execution team workers:
 - approximately 25 workers based at the Regional Operations Centre at the PKCT;
 - approximately 10 workers based at Shaft Site No. 5A; and
 - approximately 5 workers based at the Dendrobium Pit Top.
- 20 miscellaneous workers based at the Dendrobium Pit Top.

The Project operational activity would require the ongoing employment of the existing operational workforce plus an additional 50 development crew workers based at the Dendrobium Pit Top.

3.2 Dendrobium Pit Top

With regard to the road transport environment at the Dendrobium Pit Top, the Project proposes:

- short term employment of up to 60 people during construction activities, with 25 workers based on-site and the remaining 35 workers based off-site (Section 3.1);
- ongoing employment of the existing operational workforce plus an additional 50 development crew workers; and
- construction of an additional car parking area, located to the south of Cordeaux Road and accessed via Cordeaux Road east of the Dendrobium Pit Top Access Road.

3.3 Kemira Valley Coal Loading Facility

With regard to the road transport environment at the Kemira Valley Coal Loading Facility, the Project proposes:

- minor construction and development activities, consistent with existing short term maintenance and upgrade works;
- no changes to operational activities; and
- no changes to access arrangements.

3.4 Dendrobium CPP

With regard to the road transport environment at the Dendrobium CPP, the Project proposes:

- minor construction and development activities, consistent with existing short term maintenance and upgrade works;
- no changes to operational activities;
- no changes to maintenance shutdown arrangements; and
- no changes to access arrangements.

3.5 Shaft Numbers 1, 2 and 3

The Project does not propose any changes to the activities at the existing Dendrobium Shaft Numbers 1, 2 and 3, with ongoing conditions being consistent with existing operations (Section 2.4).

3.6 Shaft Site No. 5A

With regard to the road transport environment at Shaft Site No. 5A, the Project proposes:

- creation of approximately 40 jobs during construction activities, which would occur 24 hours per day, seven days per week;
- access by approximately 10 execution team workers (Section 3.1);
- access via the Cordeaux Dam access road off Picton Road, and then via fire trails and unsealed access roads; and
- use of the existing easement as a temporary car park for construction personnel adjacent to Cordeaux Dam access road (or if preferred by WaterNSW, use of the existing Cordeaux Dam Picnic Area parking, located approximately 700 m further down the access road or other area adjacent to the Picnic Area).

Once constructed, the Shaft Site No. 5A site would be primarily unattended, with access occurring intermittently up to several times per week generally limited to specific maintenance or upgrade works, consistent with the existing Dendrobium Mine Shaft Sites (Section 2.4).

3.7 Cordeaux Pit Top

IMC's mining support activities would continue at the Cordeaux Pit Top, consistent with current operations, noting that the Cordeaux Pit Top is not part of the Dendrobium Mine. No changes to current access arrangements for the Cordeaux Pit Top are proposed as part of the Project. The Cordeaux Pit Top is an approved development which would continue to be used by the Project. IMC would be prepared to surrender the existing Wollongong Council consent (D74/134) and rely on any Infrastructure Approval for the Project.

3.8 Traffic Assessment Scenarios

The majority of Project construction activities would occur intermittently within a two-year period. Upgrade works at the Dendrobium Pit Top would occur during the first year (nominally 2023), and ventilation shaft construction and development would occur over both years (nominally 2023-24). The construction period scenario adopted for this assessment assumes construction activities occur simultaneously at both the Dendrobium Pit Top and at Shaft Site No. 5A. These activities are expected to occur in 2023.

The additional Project operational workforce is expected to peak in 2029, and then reduce as development crews in Area 5 are reduced. Those crews may however be transferred to mining of Area 3C, thus it is assumed that with the Project, the workforce may remain at the peak until approximately 2037. The operational period scenario adopted for this assessment is nominally 2037, with the peak workforce present at the Dendrobium Pit Top, combined with longer term growth in background traffic.

In summary, the following scenarios have been adopted for this assessment of the potential road transport impacts of the Project:

- Construction phase, nominally in 2023, with construction activity at both Dendrobium Pit Top and at Shaft Site No. 5A; and
- Operational phase (peak) in 2037, with peak operational workforce at the Dendrobium Pit Top.

4 Existing Road Environment

4.1 Road Network

The existing road network near the Dendrobium Mine is described below.

Princes Motorway (Route M1) is predominantly a dual carriageway motorway linking Waterfall in the south of Sydney to Mount Ousley Road and the Illawarra Highway at Yallah. It follows a roughly parallel route to the Princes Highway to the Bulli Tops interchange, bypassing the Wollongong central business district. Mount Ousley Road is the portion of the Princes Motorway between the top of Bulli Pass and North Wollongong, where Mount Ousley Road extends to the Princes Highway. Mount Ousley Road typically has two or three travel lanes in each direction, with truck and bus lanes for the slower moving vehicles on the steep grades.

Princes Highway (HW1) is a State and Regional Road linking Sydney to the Victorian border. It is a State Road from the southern end of the Princes Motorway at the Bulli Tops interchange via Bulli Pass and Bulli to Bellambi Lane, then via Bellambi Lane and Memorial Drive to the on/off ramps at Flinders Street, North Wollongong, then via Flinders Street, Keira Street and Crown Street, Wollongong to the junction with Five Islands Road at Unanderra. It is a Regional Road from the intersection of Five Islands Road at Unanderra via Dapto, to the intersection with the F6 Southern Freeway at Yallah.

Picton Road (Main Road 95) is a State Road, which extends from Mount Ousley Road at its south-eastern end to Picton at its north-western end. There is an interchange at the intersection of Picton Road with the Hume Motorway, which allows all vehicle movements between the two routes. Similarly, at the intersection with Mount Ousley Road, an interchange permits all movements between the two routes.

Picton Road is identified in the draft Illawarra-Shoalhaven Regional Transport Plan (Transport for NSW [TfNSW], 2020a) as providing a “nationally significant east-west transport link between Metro Wollongong and Western Sydney. Picton Road comprises existing challenges in the areas of road safety, road geometry, and freight access, and demand is anticipated to increase as the Wilton and Greater Macarthur Growth Areas continue to develop.”

The Plan indicates that by 2056, Picton Road is forecast to carry almost 70 percent (%) of the total road freight task associated with the region, and that TfNSW will investigate opportunities to expand the network for Higher Productivity Vehicles (vehicles that can carry more payload than a B-double) on Picton Road and other key freight routes.

TfNSW is currently planning the duplication of Picton Road, which was identified in the *NSW Freight and Ports Plan for 2018-2023* (TfNSW, 2018) as being key to meeting the demand for additional freight and improved safety. The Picton Road strategic business case, including preferred upgrades, is due to be completed in the second half of 2021, following which, work will start on concept and detailed design (TfNSW, 2020b).

A number of safety improvements have recently been completed on Picton Road in recent years, including changing line markings between Mount Keira Road and Mount Ousley Road to create a widened centre median, widening of Picton Road for approximately 2 km east of Cordeaux Dam Road, installation of a median barrier west of the Cordeaux Pit Top with widened centre lines and audio tactile line marking, installation of acceleration lanes from rest areas, safety barrier installation, provision of a fauna underpass and fauna fencing.

Cordeaux Road is a local road that provides access from Kembla Heights to the Princes Highway at Figtree, via Cordeaux Heights and Mount Kembla. The intersection of Cordeaux Road with the Princes Highway is controlled by a two-lane roundabout, with single entry and exit lanes on the Cordeaux Road leg. Most intersections along Cordeaux Road are priority-controlled T-intersections, with the exception of the signalised intersection with Central Road. Cordeaux Road typically has a single travel lane in each direction with kerbside parking permitted, and a speed limit of 60 km/h.

There are two speed humps that provide thresholds to a 40 km/h speed zone on Cordeaux Road at Mount Kembla, between immediately west of James Road and east of Cudjee Crescent. Signage in this area indicates there is a full time "high pedestrian activity" 40 km/h speed limit, a before and after school period 40 km/h speed limit, and a truck and bus speed limit of 40 km/h.

Cordeaux Road climbs steeply through Mount Kembla to the Dendrobium Pit Top Access. An off-road cycleway is provided along the southern side of Cordeaux Road along most of its length from near the Princes Highway to the eastern end of the built-up area of Mount Kembla. There is a school crossing immediately south of Benjamin Road adjacent to Mount Kembla Public School.

West of the Dendrobium Pit Top Access, Cordeaux Road forms a two lane, two-way rural road, with a winding alignment, narrow or no shoulders, no footpaths, and several bends with advisory speeds of 35 km/h. West of the Dendrobium Pit Top Access, Cordeaux Road also provides a connection to Harry Graham Drive at a T-intersection, at which the western approach of Cordeaux Road forms the minor leg. At that intersection, Cordeaux Road west is signposted as "no through road" and provides only local access to a small number of residences and fire trails.

Harry Graham Drive is a local road that provides a link from Cordeaux Road west of the Dendrobium Pit Top Access to Mount Keira Road. It typically has a two lane, sealed carriageway and is signposted with an eight tonne load limit. Harry Graham Drive has a speed limit of 50 km/h through Kembla Heights, increasing to 60 km/h and 80 km/h to Mount Keira Road. Within the Illawarra State Conservation Area, there is a number of short sections which are temporarily restricted to a single lane width, at which southbound traffic is required to give way.

Mount Keira Road is a local road which extends between Picton Road and the Princes Highway at West Wollongong, via Mount Keira. It is typically a two lane, two-way rural road, with varying shoulder widths, centre delineation and speed limits of 80 km/h and 60 km/h.

Clive Bissell Drive provides a link from Mount Keira Road to Mount Ousley Road (Princes Motorway), where only left turn movements between Clive Bissell Drive and Mount Ousley Road are permitted. Clive Bissell Drive is a sealed two lane, two-way rural road, with unsealed shoulders, centre delineation and a posted speed limit of 60 km/h.

Cordeaux Dam Access extends south-west from Picton Road and provides access to the Cordeaux Dam grounds, recreational facilities, car parking and office, and to fire trails in the Upper Nepean State Conservation Area and surrounds. The access road is a sealed, two-lane two-way road with a posted speed limit of 70 km/h. has a single travel lane in each direction. Picton Road has dedicated left and right turn deceleration lanes for vehicle entering the Cordeaux Dam access road.

4.2 Railway Level Crossings

The Dendrobium Mine makes use of the Kemira Valley Rail Line to transport coal from the Kemira Valley Coal Loading Facility to the Dendrobium CPP, located within the Port Kembla Steelworks precinct. Between the Kemira Valley Coal Loading Facility and Port Kembla Steelworks, the Kemira Valley Rail Line crosses a number of roads, typically at grade-separated crossings. There are two level crossings along the Kemira Valley Rail Line, one being on Central Road south of Cordeaux Road and one on an unnamed access road off Marley Place at Unanderra.

The level crossing on Central Road is actively controlled, with flashing lights and boom arms, and a dedicated gated pedestrian path on the western side. Yellow cross-hatching on the road surface indicates the area which drivers are expected to keep clear, noting that a queue of vehicles from the signals at the intersection of Central Road and Cordeaux Road could extend across the level crossing if not properly managed. Queuing space of approximately 40 m is provided between the signalised intersection stop line and the cross hatched area at the level crossing. North of the level crossing, Central Road has two northbound travel lanes, thus up to 12 cars could queue (six in each lane) at the signals and remain clear of the level crossing. Turn bays are provided on both approaches of Cordeaux Road, which allow any vehicles waiting to turn into Central Road to remain clear of the through lanes.

The level crossing at Unanderra is controlled with signs and flashing lights. The unnamed road provides access to a single industrial site.

4.3 TfNSW Traffic Volume Data

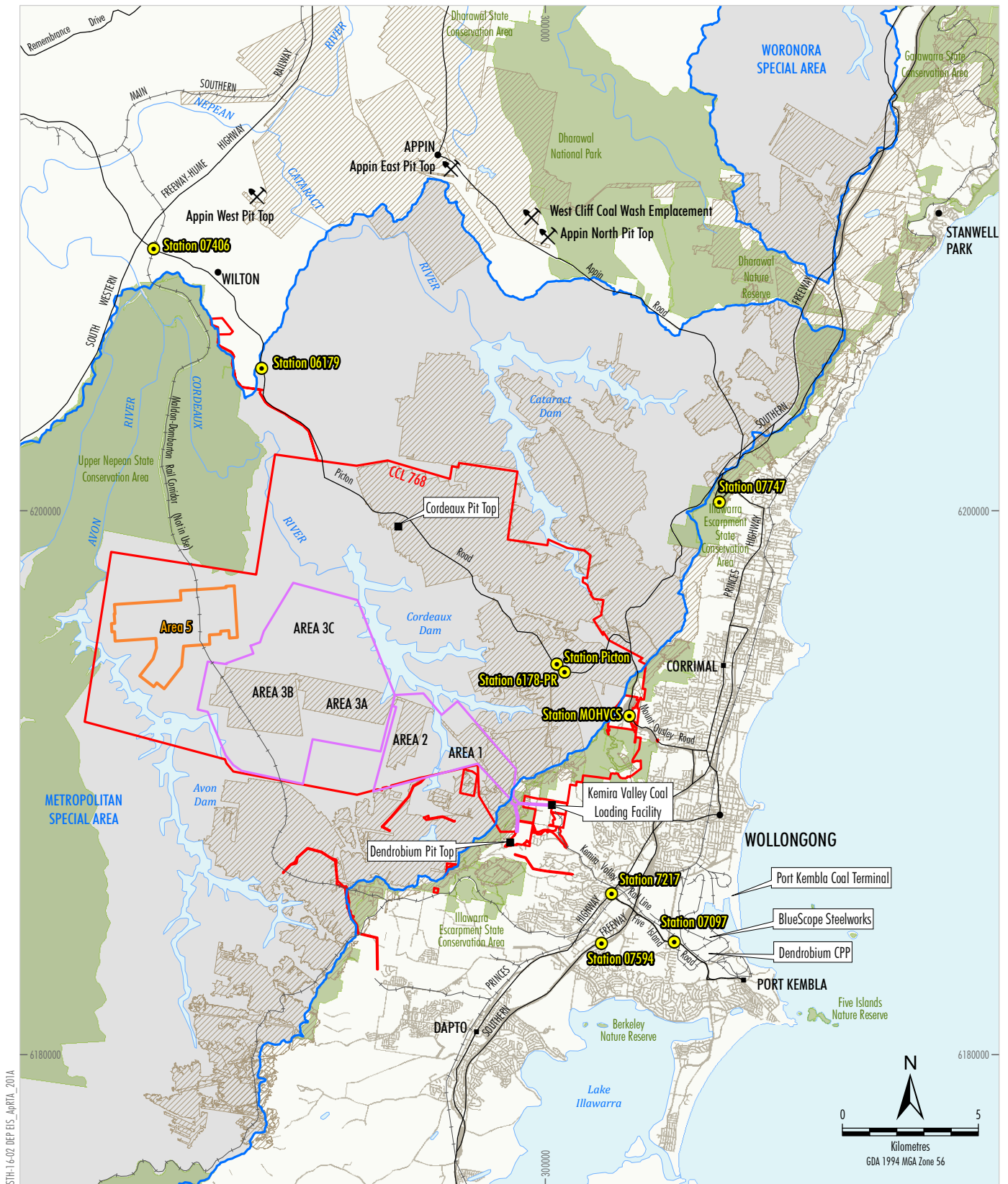
TfNSW collects and publishes traffic volume data on classified roads throughout NSW. Annual Average Daily Traffic (AADT) data on roads near the Dendrobium Mine has been collated from the TfNSW data over the past ten years. AADT is the average number of vehicles passing the survey location per day, measured over one year. At some locations, reported volumes are for one direction of travel only, which are noted in Table 4.1. Survey locations are presented in Figure 4.1.

Table 4.1: AADT Volumes at TfNSW Count Stations (vehicles per day)

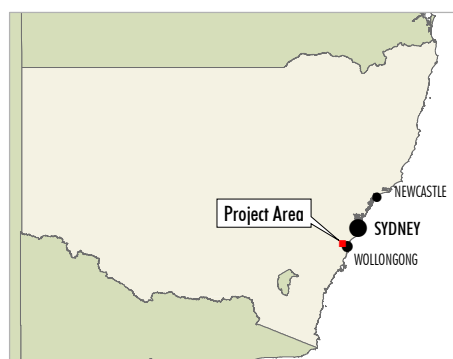
Road and Location	2012	2013	2014	2015	2016	2017	2018	2019	2020	Jan-Jun 2021
Picton Road – East of Janderra Lane, Wilton (Station 07406)	15,586	8,580 ^A	-	-	-	-	-	-	-	-
Picton Road – North of Mount Keira Road, Cordeaux (Station 6178-PR)	-	-	-	17,112	18,958	19,988	20,032	10,033 ^A	9,420 ^A	10,723 ^A
Picton Road – East of Mount Keira Road, Cataract (Station PICTON)	10,484	-	-	-	-	-	-	-	-	-
Picton Road – South of Macarthur Drive, Wilton (Station 06179)	-	-	-	8,623 ^B	9,580 ^B	19,668	19,851	20,506	19,122	21,838
Princes Highway – East of Five Islands Road, Unanderra ^C (Station 7217)	-	-	-	10,636	10,655	10,876	10,926	10,963	10,548	10,785
Five Islands Road – East of Lake Avenue, Spring Hill (Station 07097)	38,960	40,817	40,915	40,691	41,362	37,560	41,534	-	-	-
Princes Highway – South of Princes Motorway, Bulli (Station 07747)	11,975	12,131	12,782	12,992	12,666	12,982	-	-	-	-
Princes Motorway – West of New Mt Pleasant Road, Mount Keira (Station MOHVCS)	-	-	-	-	51,800	53,769	53,083	54,183	77,864	53,578
Princes Motorway – West of Nolan Street, Unanderra (Station 07594)	58,897	62,168	62,250	64,802	66,190	34,751 ^D	61,370	-	-	-

Source TfNSW (2020c) ^A Westbound only, ^B Eastbound only, ^C Southbound only, ^D Northbound only

Table 4.1 demonstrates that the arterial roads in the region of the Dendrobium Mine carry significant volumes of traffic.



STH-16-02 DEP EIS_Apr12A_2014



- LEGEND**
- Dendrobium Mining Lease
 - Road
 - Railway
 - National Park, Nature Reserve and State Conservation Area
 - Historic Mine Workings
 - Declared Catchment Area
 - Dendrobium Underground Mining Area - Existing Mine (DA 60-03-2001)
 - Dendrobium Underground Mining Area Extension Project
 - TfNSW Traffic Count Station Locations

Source: Geoscience Australia, (2006); Department of Industry (2018); Department Finance, Services & Innovation (2018);



DENDROBIUM MINE Traffic Survey Locations

Figure 4-1

The TfNSW survey station on Picton Road near Wilton (06179) is a permanent classifier station, which provides additional data about the average weekday traffic characteristics at that location during 2018, 2019, 2020 and 2021 (January to June only), presented in Table 4.2.

Table 4.2: Characteristics of Average Weekday Traffic on Picton Road near Wilton

Year	Eastbound		Westbound	
	Light Vehicles	Heavy Vehicles	Light Vehicles	Heavy Vehicles
Daily (vehicles per day)				
2017	7,725	2,674	7,425	2,771
2018	7,707	2,813	7,449	2,790
2019	7,988	2,902	7,751	2,805
2020	7,333	2,948	6,984	2,941
2021 Jan-Jun	8,327	3,186	7,931	3,240
AM Peak Hour 7 am to 8 am (vehicles per hour)				
2017	520	195	611	193
2018	535	202	612	191
2019	577	216	612	189
2020	486	228	561	191
2021 Jan-Jun	543	248	612	214
PM Peak Hour 4 pm to 5 pm (vehicles per hour)				
2017	779	163	579	158
2018	771	167	579	154
2019	781	169	627	167
2020	712	167	557	167
2021 Jan-Jun	801	183	615	188

Source TfNSW (2020c)

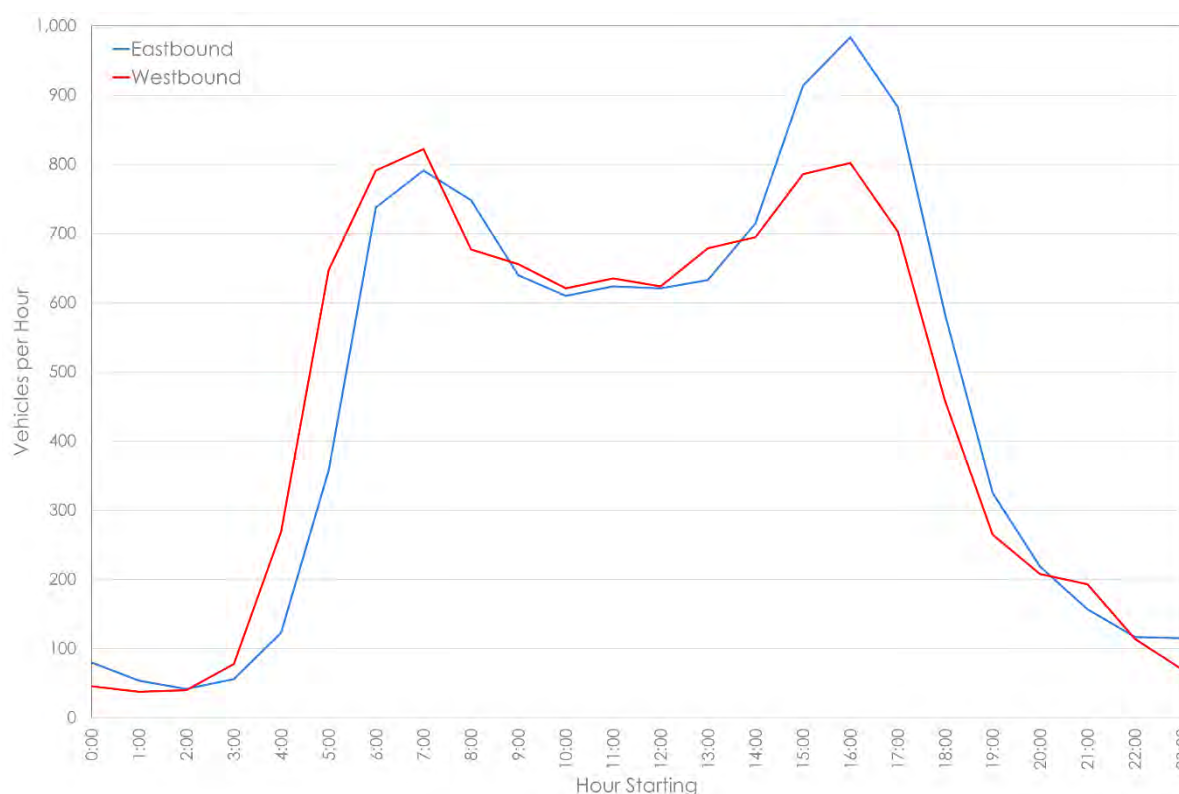
The 2021 data in Table 4.2 indicates that Picton Road is presently carrying approximately 22,700 vehicles per weekday, with 1,600 vehicles per hour during the morning peak hour, and 1,800 vehicles per hour in the evening peak hour. Over the five years of data the following is noted:

- the morning peak hour consistently occurred between 7:00 am and 8:00 am;
- the evening peak hour consistently occurred between 4:00 pm and 5:00 pm;
- the peak hour volumes were consistently approximately 7% (AM peak) and 8% (PM peak) of the total daily volumes;
- during the morning peak hour, the traffic is reasonably evenly split between eastbound (48.5%) and westbound (51.5%); and
- during the evening peak hour, the eastbound demand (55.3%) is somewhat higher than the westbound demand (44.7%).

It is noted that NSW public health orders that impact travel behaviour commenced at the end of June 2021, and so the data does not include any period in 2021 impacted by travel restrictions. The growth in traffic on Picton Road over the five years presented above was not linear, with a decrease from 2019 to 2020. Over the four years from 2017 to 2021, the average weekday daily traffic increased by 10% across all vehicles.

Figure 4.2 presents the hourly distribution of traffic on Picton Road by direction during 2021.

Figure 4.2: Picton Road Average Weekday Hourly Traffic 2021



4.4 Traffic Surveys 2017

A program of traffic surveys was undertaken by Matrix Traffic and Transport Data on behalf of IMC during March and April 2017. The program included surveys of vehicle turning movements between 5:30 am and 8:30 am, and between 2:00 pm and 5:00 pm on Thursday 30 March 2017 at the intersections of:

- Cordeaux Road and the Dendrobium Pit Top Access Road;
- Cordeaux Road and Stones Road; and
- Picton Road and the Cordeaux Pit Top Access Road.

The program included automatic tube counter (ATC) surveys over one week from 30 March to 5 April 2017 on:

- Dendrobium Pit Top Access Road (excluding the visitor car park);
- Cordeaux Pit Top Access Road;
- Kemira Valley Coal Loading Facility Access Road; and
- Cordeaux Road in Mount Kembla.

The ATC on the Dendrobium Pit Top Access was located west of the intersection of the access with Cordeaux Road, and so did not record vehicles entering or exiting the car parking area to the east of the intersection. That eastern car park contained some 30 formal and informal car parking spaces, including six designated visitor parking spaces, and was used by a mix of staff and visitors. The survey included trips made to and from the main car parking area at the Dendrobium Pit Top, which contained approximately 120 car parking spaces at the time of the surveys.

Over the six hours surveyed at the intersection of the Dendrobium Pit Top Access with Cordeaux Road, approximately 95% of traffic using the Dendrobium Pit Top Access Road approached from or departed to Cordeaux Road east. Of the traffic accessing the Cordeaux Pit Top, approximately 89% approached from or departed to Picton Road east.

The surveyed daily traffic volumes recorded during the ATC survey program are summarised in Table 4.3.

Table 4.3: 2017 Daily Traffic by Day of the Week (vehicles per day)

Location	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Dendrobium Pit Top Access Road ^A	526	601	569	545	401	195	192
Kemira Valley Coal Loading Facility Access Road	33	37	44	36	25	18	20
Cordeaux Road	3,230	3,574	3,758	3,509	3,774	3,412	2,894
Cordeaux Pit Top Access Road	107	116	123	97	73	66	4

^A excludes traffic to/from the visitor parking area at Dendrobium Pit Top.

The results indicate that traffic conditions on the Dendrobium Mine access roads on weekdays are distinctly different from those on weekend days, and distinctly lower on the Friday compared with the other weekdays. In contrast, surveyed daily traffic on Cordeaux Road was at its highest on Friday and the surveyed volume on the Saturday was greater than on the Monday.

The traffic surveys also provide data on the composition of the traffic based on the Austroads Vehicle Classifications. Light vehicles include motorcycles, cars, vans, four-wheel drives (4WDs), and utilities (including those towing a trailer or caravan). Heavy rigid vehicles include single unit trucks and buses including some of the longer wheelbase 4WDs and utilities, and articulated vehicles include semi-trailers, rigid trucks with trailers, B-doubles and road trains. Review of the surveyed traffic composition against the observed conditions indicates that many of the heavy vehicles recorded on the Dendrobium Pit Top Access Road ATC were utilities and 4WDs that would be considered as light vehicles (less than 4.5 tonnes gross vehicle mass) rather than trucks or buses. Table 4.4 presents the surveyed classifications of vehicles over the average weekday daily.

Table 4.4: Average Weekday Daily Traffic Composition (%)

Location	Light	Heavy Rigid	Heavy Articulated
Dendrobium Pit Top Access Road ^A	89.9	9.8	0.3
Kemira Valley Coal Loading Facility Access Road	84.0	16.0	0.0
Cordeaux Road	94.0	5.6	0.4
Cordeaux Pit Top Access Road	86.4	10.7	2.9

^A excludes traffic to/from the visitor parking area at Dendrobium Pit Top.

The spread of traffic throughout the average weekday is such that the busiest hour at each of the surveyed locations does not necessarily coincide. This is shown in Figure 4.3, which demonstrates that Cordeaux Road experiences two distinct peak hours in the morning and afternoon, however these do not necessarily coincide with the peaks associated with the Dendrobium Pit Top and Kemira Valley Coal Loading Facility accesses.

Figure 4.3: Surveyed Average Weekday Hourly Traffic 2017



Table 4.5 summarises the volumes surveyed during the busiest hour in the morning (midnight to midday) and busiest hour in the evening (midday to midnight) on the average weekday, and the time at which the busiest hour occurred at each location.

Table 4.5: Average Weekday Peak Hour Traffic 2017 (vehicles per hour)

Location	AM Peak Hour	Vehicles	PM Peak Hour	Vehicles
Dendrobium Pit Top Access Road ^A	5:00 am to 6:00 am	69	4:00 pm to 5:00 pm	56
Keira Valley Coal Loading Facility Access Road	7:00 am to 8:00 am	5	3:00 pm to 4:00 pm	3
Cordeaux Road	8:00 am to 9:00 am	329	4:00 pm to 5:00 pm	342
Cordeaux Pit Top Access Road	7:00 am to 8:00 am	14	3:00 pm to 4:00 pm	14

^A excludes traffic to/from the visitor parking area at Dendrobium Pit Top.

4.5 Traffic Survey 2021

At the time of the surveys in 2017, the workforce at the Dendrobium Pit Top was indicatively 400 people, with two development units in use. A third development unit was introduced in FY2018, and a fourth in FY2020, with increases in workers attending the site each day. The car park at the Dendrobium Pit Top has also been upgraded and extended over that time, with some additional 80 spaces available. It is reasonable to expect that those changes would have impacted the number of vehicles travelling to and from the Dendrobium Pit Top on a typical day.

To quantify how the changes in workforce and car parking have impacted traffic conditions at the Dendrobium Pit Top, a supplementary survey was undertaken at the intersection of Cordeaux Road and the Dendrobium Pit Top Access Road over a 24-hour period on Wednesday 21 July 2021. IMC advised that with the exception of non-essential visitors to the Dendrobium Pit Top, operations were normal at that time. The survey was conducted on a Wednesday with consideration of the 2017 survey results which suggest that Wednesday traffic generation was consistent with the average weekday (excluding Friday) traffic generation.

In addition to identifying each vehicle as light or heavy, the survey also separately identified the mini-buses used to transport contractors to and from the Dendrobium Pit Top. Key findings of the survey are summarised in Table 4.6 over the day and for the peak hours for traffic generated by the Dendrobium Pit Top.

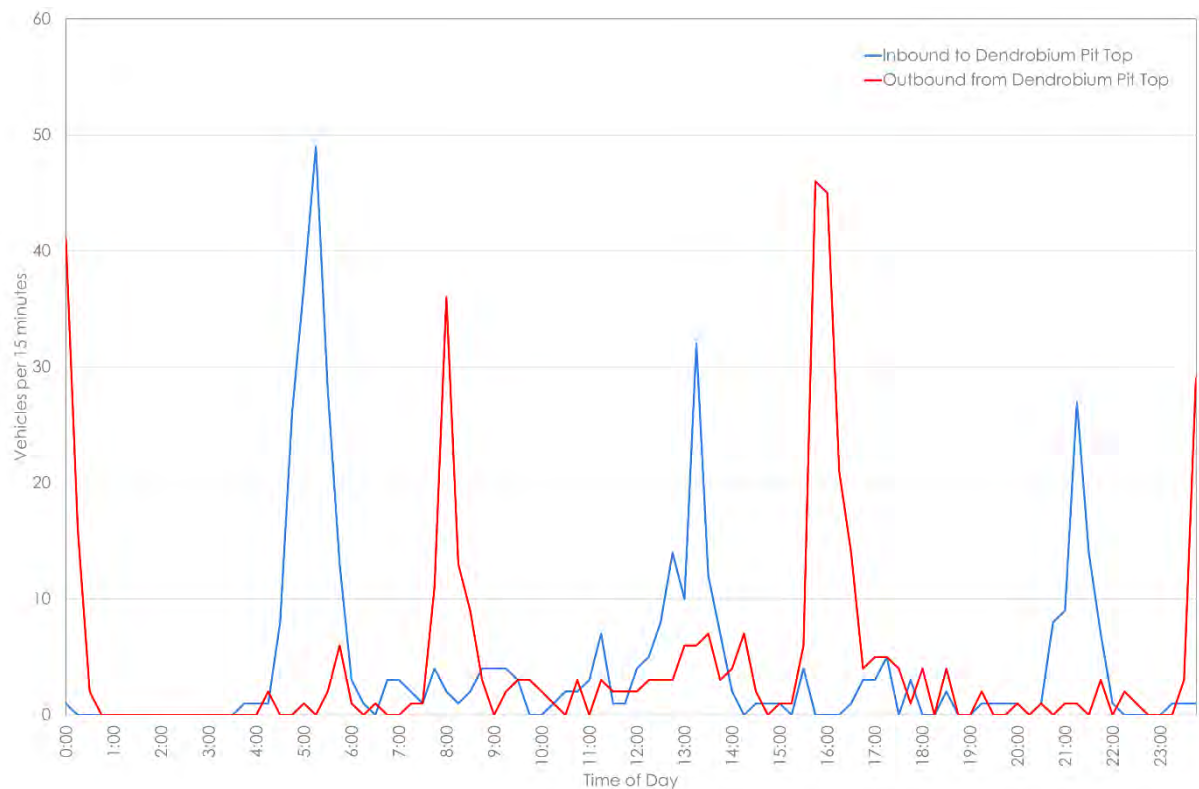
Table 4.6: Dendrobium Pit Top Survey 2021

	Light	Mini Bus	Heavy	Total
Daily (vehicles per day)	789	11	33	833
AM Peak Hour 4:45 am to 5:45 am (vehicles per hour)	143	0	0	143
PM Peak Hour 3:45 pm to 4:45 pm (vehicles per hour)	126	1	0	127

Over the 24 hour period, 48 of the vehicle movements were to or from Cordeaux Road west of the Dendrobium Pit Top, and 781 were to or from Cordeaux Road east of the Dendrobium Pit Top (two vehicles performed a u-turn exiting then re-entering the Dendrobium Pit Top, generating four vehicle trips). This is consistent with the findings of the results of the intersection survey in 2017 which found that approximately 95% of traffic using the Dendrobium Pit Top Access Road approached from or departed to Cordeaux Road east (Section 4.4).

The distribution of the traffic into and out of the Dendrobium Pit Top is presented in Figure 4.4, which shows the number of vehicle movements each 15 minute period throughout the day. This shows the inbound traffic peaking in the period prior to the shift start times (6:00 am, 2:00 pm and 10:00 pm) and the outbound traffic peaking at the shift end times (4:00 pm, 12:00 am and 8:00 am).

Figure 4.4: Dendrobium Pit Top 15-minute Vehicle Movements 2021



4.6 Road Crash History

Road crash information was obtained from TfNSW over the period between 1 October 2015 and 30 September 2020 for those roads relevant to the Project. The data include crashes which conform to the national guidelines for reporting and classifying road vehicle crashes based on the following criteria:

- The crash was reported to the police.
- The crash occurred on a road open to the public.
- The crash involved at least one moving vehicle.
- The crash involved at least one person being killed or injured or at least one motor vehicle being towed away.

Crash data were obtained and reviewed for key access routes used by vehicles travelling to and from the Dendrobium Mine:

- Cordeaux Road between Princes Highway and Harry Graham Drive;
- Harry Graham Drive between Cordeaux Road and Mount Keira Road;
- Mount Keira Road between Harry Graham Drive and Picton Road;
- Picton Road between Mount Keira Road at Cataract to Macarthur Drive at Wilton;
and
- Local roads in Mount Kembla.

Table 4.7 summarises the number of general crash types recorded on each route described above. All crashes reported in the Mount Kembla local area occurred on Cordeaux Road, and are therefore reported under Cordeaux Road results. Over the investigation period and routes reviewed, a total of 77 crashes occurred on those routes, resulting in five people being killed, 32 people being seriously injured, and 24 people being moderately injured.

Table 4.7: Crash Types on Project Access Routes (1 October 2015 to 30 September 2020)

Route	Route Length (km)	Pedestrian	Adjacent Approaches	Opposing Directions	Same Direction	U-turn/Parking	Overtaking	On-Path	Off-Path on Straight	Off-Path on Curve	Miscellaneous	Total
Cordeaux Road	5.3	-	1	2	2	-	-	2	7	4	-	18
Harry Graham Drive	7.5	-	-	1	1	-	-	2	-	8	1	13
Mount Keira Road	2.8	-	-	1	-	-	-	-	-	-	-	1
Picton Road	17.2	-	3	3	7	-	1	6	16	8	-	44
Mt Kembla local roads	-	-	-	-	-	-	-	-	-	-	-	-
Total Crashes by Type		-	4	7	10	-	1	10	23	20	1	76
Fatalities		-	-	1	-	-	1	-	3	-	-	5
Serious Injuries		-	1	3	1	-	2	9	9	8	-	32
Moderate Injuries		-	3	2	2	-	1	3	8	4	1	24

Table 4.7 demonstrates that over all the roads investigated, 53 of the reported crashes involved a single vehicle, the majority of which left the carriageway. These run-off-road (ROR) crashes (including all “off-path” crashes) made up 43 of the 76 reported crashes over all routes. Australian Road Research Board (2011) states that known causes of ROR crashes include:

- driver behaviours such as speed, inattention, avoidance manoeuvres, errant vehicles;
- driver impairment including fatigue, alcohol, drugs, mood state;

- road conditions such as horizontal alignment, shoulder deficiencies, slippery surface, poor delineation, damaged surfaces;
- vehicle failure; and
- environmental conditions such as rain, fog, snow, livestock or native fauna.

4.6.1 Cordeaux Road

A summary of the key characteristics of crashes that occurred on Cordeaux Road over the period investigated is presented in Appendix B. Key aspects of the road crash history are:

- No crashes involved a heavy rigid or articulated truck.
- One crash occurred at the intersection of Cordeaux Road with the Dendrobium Pit Top Access. That crash occurred at 4:00 pm on 29 August 2016, in fine weather on a dry road surface and in daylight conditions. A car that turning right into the Dendrobium Pit Top struck an eastbound light truck on Cordeaux Road. Neither speeding nor fatigue were nominated as contributing factors to the crash.
- No crashes occurred in the 40 km/h zone on Cordeaux Road during the school zone hours.
- Three crashes occurred at the roundabout at the intersection of Cordeaux Road with Princes Highway, one of which involved the sudden illness of the driver, and one of which involved speeding.
- A fatal crash occurred, approximately 500 m west of William James Drive, in the 60 km/h speed limit zone, at 3:15 pm on 21 February 2020. The crash involved an eastbound car travelling at excessive speed, which left the carriageway on a straight section and struck a utility pole. The crash occurred in overcast weather on a dry road surface and in daylight conditions. Speeding was nominated as a contributing factor.

4.6.2 Harry Graham Drive and Mount Keira Road

A summary of the key characteristics of crashes that occurred on Harry Graham Drive and Mount Keira Road combined over the period investigated is presented in Appendix B. Key aspects of the road crash history are:

- No crashes involved a heavy rigid or articulated truck.
- Two crashes occurred at or near the hairpin bend in Harry Graham Road approximately 2 km north of Mount Kembla. The bend is signposted in both directions with an advisory speed of 25 km/h, warning signs for the hairpin bend and chevrons on the outside of the bend. Speeding was nominated as a contributing factor in both crashes, one of which involved a northbound motorcycle which struck an object on the carriageway, and the other involved a southbound light truck which left the carriageway to the left on the right hand bend and struck the guardrail. Both crashes occurred on a dry road surface, in fine weather and in daylight conditions.

- Two crashes occurred on the sweeping bend near the intersection of Morans Road. That bend is not signposted, and it is noted that vegetation grows close to the edge of the carriageway on the inside of the bend. Speeding was nominated as a contributing factor to both crashes, one of which involved a northbound motorcycle which lost control on the carriageway on a dry road surface in fine weather and daylight conditions. The other involved a southbound car which left the carriageway to the left on the left-hand bend and struck an object, and occurred on a wet road surface in overcast weather and darkness.
- Three crashes occurred at or near bends in Harry Graham Drive approximately 2 km from Mount Keira Road. Speeding was nominated as a contributing factor in two of those crashes, both of which involved the vehicle (one motorcycle, one car) leaving the carriageway. In third crash, a southbound car was on the incorrect side of the road and struck a northbound car head on.

4.6.3 Picton Road

A summary of the key characteristics of crashes that occurred on Picton Road over the period investigated is presented in Appendix B. Key aspects of the road crash history are:

- No crashes occurred at or near the intersection with Cordeaux Dam access road.
- Two crashes occurred at or near the intersection with the Cordeaux Pit Top Access Road in 2018, however neither were related to conflicting vehicles at the intersection. Both were single-vehicle crashes involving the vehicle leaving the carriageway on the straight length of Picton Road, and fatigue was nominated as a contributing factor in both crashes.
- Four crashes occurred at the intersection of Picton Road with Mount Keira Road, one of which was not related to conflicting vehicles at the intersection. The other three crashes involved a vehicle turning right out of Mount Keira Road striking a westbound vehicle in Picton Road. Two of those involved a driver disobeying the traffic controls, and the other involved a speeding vehicle.
- There was a notable decrease in crashes from 2018 to 2019, noting that progressive upgrades have been undertaken on Picton Road.

4.7 Dendrobium Mine Traffic

Review of the traffic survey data demonstrates that the traffic generated by the Dendrobium Mine in the Mount Kembla area (i.e. the Dendrobium Pit Top and Kemira Valley Coal Loading Facility combined) is distinctly lower on Friday than the other weekdays. This is due to the changed shift arrangements over the weekend compared with weekdays, with those changes occurring from Friday afternoon through to early Monday morning. To consider typical daily conditions relating to Dendrobium Mine traffic generation, TTPP has therefore considered an average day over Monday to Thursday rather than over all weekdays.

4.7.1 Dendrobium Mine Traffic Distribution

4.7.1.1 Workforce

The residential postcodes of the direct employee workforce were reviewed to determine the likely distribution of routes used by the workforce travelling to and from the Dendrobium Mine. The results are summarised in Table 4.8, which compares the current workforce characteristics with that of similar data collected in 2017.

Table 4.8: Direct Employee Directional Travel to/from Dendrobium Mine

Route to/from	2017	2021
North via Princes Highway	24.8	25.2
South via Princes Highway	7.8	8.2
South via Princes Motorway	36.0	35.8
South via Five Islands Road	11.2	9.4
East via The Avenue	7.0	7.3
West via Picton Road	2.7	2.4
Local	10.5	11.8

Table 4.8 suggests that the distribution of the workforce has remained relatively stable. It is noted that a portion of the traffic to/from the north via the Princes Highway would use the Princes Motorway at West Wollongong. Some of those drivers travelling to/from the Princes Motorway (north) may choose to use Harry Graham Drive and Mount Keira Road to access Mount Ousley Road via Picton Road or Clive Bissell Drive. The latter would only be used by outbound traffic from the Dendrobium Mine, because only left turn movements are permitted between Clive Bissell Drive and Mount Ousley Road.

Alternatively, drivers travelling to/from the north along the Princes Highway may choose to use Gibsons Road between the Princes Highway and Cordeaux Road, or remain on Cordeaux Road to the Princes Highway when travelling between the Princes Highway and the Dendrobium Pit Top.

Similarly, a portion of the drivers assumed to travel to and from the north (e.g. to/from suburbs of south or south-west Sydney) may choose to travel via Harry Graham Drive, Mount Keira Road and Picton Road, depending on their final destination.

As described (Section 2.1.2), the contracting company transports workers to and from the Dendrobium Pit Top from a site on Marley Place at Unanderra. Two buses are used per shift across both weekdays and weekends, transporting up to 42 contractors per shift. It is expected that the buses travel via Marley Place, Five Islands Road, Princes Highway and Cordeaux Road.

The balance of the contractors who do not travel by bus would travel in private or company vehicles. The distribution of those contractor trips on the road network is assumed to be consistent with that of the direct employee workforce.

4.7.1.2 *Visitors and Deliveries*

The results of the intersection survey in 2021 confirm that all heavy vehicle movements to and from the Dendrobium Pit Top entered or exited the site via Cordeaux Road east of the Dendrobium Pit Top. The Project would not change this arrangement.

The majority of deliveries are sourced from local suppliers in the Wollongong region. Non-local deliveries come from Newcastle, and to a lesser extent from Sydney. Delivery vehicles would thus be expected to use the Princes Highway and Cordeaux Road to travel to and from the Dendrobium Pit Top or Kemira Valley Coal Loading Facility. Those travelling from Newcastle or Sydney would access the Princes Highway from the Princes Motorway. Those travelling from the local Wollongong region would access the Princes Highway at various locations depending on the origin of the trip.

Visitors to the Dendrobium Pit Top are also primarily sourced from the Wollongong region, and thus typically travel to and from the site via Cordeaux Road east.

4.7.2 Dendrobium Pit Top

At the time of the 2021 survey of Dendrobium Pit Top traffic (Section 4.5), non-essential visitors to the Dendrobium Pit Top were not permitted, thus any trips generated by those visitors under normal conditions were not captured by the survey. To account for this, TPPP has referred to the aforementioned records of visitors signing in to the Dendrobium Pit Top over one month in 2017. The change in workforce since that time is not expected to have impacted the number of visitors. The data indicate that on average, there are four visitors per day, however this varies from day to day, with no visitors attending the Dendrobium Pit Top on many days. Considering only those days during which there were visitors to the Dendrobium Pit Top, there was an average of 11 to 12 visitors per day.

On this basis, TPPP has assumed that under normal conditions, 12 visitors may attend the Dendrobium Pit Top on any one day, which would generate 24 vehicle trips over the day. Visitors typically attend during daylight business hours 9:00 am to 5:00 pm, and for the purpose of this assessment, it has been assumed that up to four visitor vehicles may approach or depart the Dendrobium Pit Top during the afternoon peak hour. It is unlikely that visitors attend the site during the early morning peak hour.

On the survey day, 33 heavy vehicle movements were recorded to and from the Dendrobium Pit Top. The Dendrobium Pit Top typically receives some 20 deliveries per day by heavy vehicles, therefore TTP has assumed that on any one day, up to 40 heavy vehicle movements may be generated by deliveries. For the purpose of this assessment, it has been assumed that up to two of the additional seven heavy vehicle movements above those surveyed may occur during the afternoon peak hour, noting that those trips would occur only after 4:00 pm. It is unlikely that heavy vehicle deliveries would coincide with the early morning peak hour.

The resulting estimated trip generation of the Dendrobium Pit Top including visitors and average day deliveries is summarised in Table 4.9.

Table 4.9: Dendrobium Pit Top Vehicle Trips by Type

	Light	Mini Bus	Heavy ^A	Total
Daily (vehicles per day)				
Workforce	789	11	0	800
Visitor	24	0	0	24
Deliveries	0	0	40	40
Total	813	11	40	864
AM Peak Hour 4:45 am to 5:45 am (vehicles per hour)				
Workforce	143	0	0	143
Visitor	0	0	0	0
Deliveries	0	0	0	0
Total	143	0	0	143
PM Peak Hour 3:45 pm to 4:45 pm (vehicles per hour)				
Workforce	126	1	0	127
Visitor	4	0	0	4
Deliveries	0	0	2	2
Total	130	1	2	133

^A Heavy vehicles only permitted 7:00 am to 8:00 am, 9:30 am to 2:30 pm and 4:00 pm to 5:00 pm.

The distribution of the existing Dendrobium Pit Top traffic onto the surrounding roads has been estimated as summarised in Table 4.10.

Table 4.10: Dendrobium Pit Top Vehicle Trip Distribution

Trip Type	Cordeaux Road East				Cordeaux Road West			
	Light	Mini Bus	Heavy ^A	Total	Light	Mini Bus	Heavy ^A	Total
Daily (vehicles per day)								
Workforce	741	11	0	752	48	0	0	48
Visitor	24	0	0	24	0	0	0	0
Deliveries	0	0	40	40	0	0	0	0
Total	765	11	40	816	48	0	0	48
AM Peak Hour 4:45 am to 5:45 am (vehicles per hour)								
Workforce	134	0	0	134	9	0	0	9
Visitor	0	0	0	0	0	0	0	0
Deliveries	0	0	0	0	0	0	0	0
Total	134	0	0	134	9	0	0	9
PM Peak Hour 3:45 pm to 4:45 pm (vehicles per hour)								
Workforce	118	1	0	119	8	0	0	8
Visitor	4	0	0	4	0	0	0	0
Deliveries	0	0	2	2	0	0	0	0
Total	122	1	2	125	8	0	0	8

^A Heavy vehicles only permitted 7:00 am to 8:00 am, 9:30 am to 2:30 pm and 4:00 pm to 5:00 pm.

4.7.3 Kemira Valley Coal Loading Facility

Operations at the Kemira Valley Coal Loading Facility have not materially changed since the surveys were conducted in 2017, therefore the number of vehicle trips generated by the Kemira Valley Coal Loading Facility would also not have materially changed since that time. The 2017 survey results are therefore considered representative of existing conditions at the Kemira Valley Coal Loading Facility.

Review of the traffic survey data demonstrates that the traffic generated by the Dendrobium Mine in the Mount Kembla area is distinctly lower on Friday than the other weekdays. This is due to the changed shift arrangements over the weekend compared with weekdays, with those changes occurring from Friday afternoon through to early Monday morning. To consider typical daily conditions relating to traffic generation of the Kemira Valley Coal Loading Facility, TTPP has therefore considered an average day over Monday to Thursday only.

The number of vehicle trips generated by each of the type of vehicles over the average day and peak hours has been estimated as shown in Table 4.11.

Table 4.11: Kemira Valley Coal Loading Facility Vehicle Trips by Type

	Light	Mini Bus	Heavy	Total
Daily (vehicles per day)				
Workforce	32	0	0	32
Visitor	0	0	0	0
Deliveries	0	0	6	6
Total	32	0	6	38
AM Peak Hour 7:00 am to 8:00 am (vehicles per hour)				
Workforce	5	0	0	5
Visitor	0	0	0	0
Deliveries	0	0	1	1
Total	5	0	1	6
PM Peak Hour 3:00 pm to 4:00 pm (vehicles per hour)				
Workforce	3	0	0	3
Visitor	0	0	0	0
Deliveries	0	0	0	0
Total	3	0	0	3

Average day Monday to Thursday

Based on the distributions described in Section 4.7.1, the significant majority of traffic to and from the Kemira Valley Coal Loading Facility would travel to and from the site via Cordeaux Road east.

4.7.4 Dendrobium CPP

The typical workforce of 14 employees and up to seven contractors at the Dendrobium CPP operates rotating 12-hour shifts (7.00 am to 7.00 pm and 7.00 pm to 7.00 am), and car parking is provided on site for the employees. The CPP attracts very few visitors.

On this basis, it is estimated that the Dendrobium CPP generates approximately 42 vehicle trips per day as a result of the movement of the workforce to and from the site. It is estimated that access to battery service and gas processing facilities along the same employee access road generate approximately 50 vehicle trips per day, noting that these trips are not associated with Dendrobium Mine activity.

During occasional shutdowns, up to 200 workers may be at the CPP, however this is an infrequent event occurring once per year for up to three weeks, and is not considered relevant to the day-to-day operation of the Dendrobium Mine.

4.8 Maldon to Dombarton Rail Corridor

The Maldon to Dombarton Railway is a proposed 35 km single track rail freight line between the Main South Line at Maldon in the Southern Highlands and the Moss Vale Unanderra Line at Dombarton near Port Kembla. Construction on the line commenced but was suspended. In 2017, Infrastructure Australia did not recommend that the project be added to the Infrastructure Priority List as it would impose a net cost on the Australian economy and not justify its costs (Infrastructure Australia, 2017).

The rail corridor for the Maldon to Dombarton link diverges from the Main South line at Maldon via a triangular junction and heads in a south-easterly direction via a proposed bridge over the Nepean River before crossing beneath Hume Highway and Picton Road. It then proceeds to Wilton, over the Cordeaux River, passing through the Dendrobium Mining Lease and a proposed 4 km tunnel before joining the Moss Vale Unanderra line at Dombarton.

Considering the routes used by Dendrobium Mine road traffic (Section 4.7.1) and the alignment of the proposed Maldon to Dombarton railway, it is anticipated that should construction of the railway proceed, there would be no interaction between rail traffic on the Maldon to Dombarton corridor and Dendrobium Mine road traffic. Access to the surface above the proposed Area 5 mining will be required for monitoring and management activities. This access would be via existing Fire Road crossing located along the proposed Maldon to Dombarton railway. No further consideration has therefore been given to interaction between the Dendrobium Mine and the rail corridor with regard to the road transport environment. Impacts due to mining on the Maldon to Dombarton railway are considered in the *Dendrobium Mine Extension Project - Subsidence Assessment* (MSEC, 2022).

5 Project Traffic Generation

5.1 Construction Traffic

Project construction activity would occur at the Dendrobium Pit Top, the proposed car park extension opposite the Dendrobium Pit Top on the southern side of Cordeaux Road and the new Shaft Site No. 5A, with a combined total additional temporary workforce of approximately 100 people.

Construction and development activities would occur at the Kemira Valley Coal Loading Facility, Dendrobium CPP, existing Shaft Sites and along the Kemira Valley Rail Line. The works at those sites are expected to be minor, and consistent with short term maintenance and upgrade works which currently occur as part of the Dendrobium Mine's operations, so are not considered further in this assessment.

5.1.1 Dendrobium Pit Top

The initial Project construction activities would involve additional workers, deliveries and visitors to the facilities at the Dendrobium Pit Top.

Construction activity would attract a short-term workforce based at the Dendrobium Pit Top made up of approximately five execution team workers and 20 miscellaneous construction workers (Section 3.1). The majority of these workers would work the day shift consistent with the shift times of the existing operational workforce, i.e. 6:00 am to 4:00 pm on weekdays. The execution team workers may work that day shift or typical office hours, however as a robust assessment, it has been assumed that they would work the day shift hours, and so arrive and depart at the same time as the miscellaneous workers.

These workers would typically drive to the Dendrobium Mine, with some level of car pooling likely. For the purpose of this assessment of traffic impacts of the Project, it is assumed that these workers would travel in passenger cars with an average of 1.1 people per vehicle. On this basis, the 25 workers per day based at the Dendrobium Pit Top would travel in 23 vehicles. Should construction contracting companies implement shuttle buses for their workforce to travel to and from the Dendrobium Pit Top, the trip generation would be significantly lower than assessed herein.

On weekdays, the vehicle trips generated by the additional workforce would be expected to occur prior to 6:00 am (23 vehicles inbound) and after 4:00 pm (23 vehicles outbound). As a robust assessment, it has been assumed that these trips would coincide with the existing peak hours associated with the traffic generated by the Dendrobium Pit Top, i.e. 4:45 am to 5:45 am, and 3:45 pm to 4:45 pm.

It would be expected that throughout the day, some of the 25 workers based at the Regional Operations Centre at PKCT would travel to and from the Dendrobium Pit Top as required. For the purpose of this assessment, it is assumed that on a typical day, up to 10 visits to the Dendrobium Pit Top would be made by workers based at the Regional Operations Centre. This would generate up to 20 vehicle trips per day, which would not tend to coincide with the peak hours described above.

It is estimated that construction activity at the Dendrobium Pit Top would generate up to an additional ten heavy vehicle deliveries per day and an additional five visitors per day.

Table 5.1 summarises the estimated average day vehicle trips generated by the Project construction activity accessing the Dendrobium Pit Top during the peak periods associated with Dendrobium Mine traffic.

Table 5.1: Dendrobium Pit Top Construction Vehicle Trips by Type

	Light	Mini Bus	Heavy ^A	Total
Daily (vehicles per day)				
Workforce	66	0	0	66
Visitor	10	0	0	10
Deliveries	0	0	20	20
Total	76	0	20	96
AM Peak Hour 4:45 am to 5:45 am (vehicles per hour)				
Workforce	23	0	0	23
Visitor	0	0	0	0
Deliveries	0	0	0	0
Total	23	0	0	23
PM Peak Hour 3:45 pm to 4:45 pm (vehicles per hour)				
Workforce	23	0	0	23
Visitor	1	0	0	1
Deliveries	0	0	2	2
Total	23	0	2	26

^A Heavy vehicles only permitted 7:00 am to 8:00 am, 9:30 am to 2:30 pm and 4:00 pm to 5:00 pm.

5.1.2 Shaft Site No. 5A

Access to the new Shaft Site No. 5A site would be via the Cordeaux Dam access road off Picton Road, and then via fire trails and unsealed access roads. A temporary car park for construction personnel would be provided adjacent to Cordeaux Dam access road (or if preferred by WaterNSW, the existing Cordeaux Dam Picnic Area parking area or adjacent area may be used, located approximately 700 m further down the access road). Due to the remote location of the new Shaft Site No. 5A, it is anticipated that the construction workers would travel by private vehicles to a meeting point on Cordeaux Dam access road, from which they would be transported in dedicated work vehicles capable of carrying multiple personnel. The Cordeaux Dam access road has previously been used with the agreement of WaterNSW for this purpose.

Construction activity at Shaft Site No. 5A would attract a short-term workforce of approximately 40 people for shaft construction, made up of 30 people on the day shift (typically 6:00 am to 4:00 pm) and 10 people on the night shift (typically 6:00 pm to 6:00 am) while shaft construction is being undertaken. Other activities at the shaft site like fan and compressor installation and borehole drilling would primarily occur on day shift.

Approximately 10 execution team workers would also be based at Shaft Site No. 5A (Section 3.1), working the day shift or office hours.

On this basis, and assuming the workforce travel to the meeting point on the Cordeaux Dam access road by private cars, with an average of 1.1 people per vehicle, the 30 construction workers and 10 execution team workers for the day period would travel in 36 vehicles to the Cordeaux Dam from Picton Road. The 10 construction workers for the night period would travel in nine vehicles to the Cordeaux Dam from Picton Road. From there, workers would be transported in a combination of utilities and personnel carriers to the construction site via fire trails, which are not public roads. Should construction contracting companies implement shuttle buses for their workforce to travel to and from the Cordeaux Dam access road, the trip generation would be significantly lower than assessed herein. These travel arrangements would be the same regardless of whether a temporary construction car park is constructed or the existing Cordeaux Dam Picnic Area parking area located further down the access road is utilised.

The number of vehicle trips generated by the workforce at the Shaft Site No. 5A are therefore estimated at:

- 36 inbound and 9 outbound vehicle trips in the morning; and
- 9 inbound and 36 outbound trips in the evening.

While the construction and execution team workers would be nominally working the same day shift, different activities would start and finish at staggered times, such that the departure of workers from the Cordeaux Dam would be spread over a longer period than would be suggested by reference only to the shift times. However as a robust assessment, it has been assumed that all arrivals and departures in the morning and evening would occur in the same hour, with the peak hours occurring at the same times as those identified at the Dendrobium Pit Top which operates the same shift times as proposed at Shaft Site No. 5A, i.e. the peak hourly trip generation is therefore estimated as:

- 36 inbound and 9 outbound vehicle trips between 4:45 am and 5:45 am; and
- 9 inbound and 36 outbound trips between 3:45 pm and 4:45 pm.

It would be expected that throughout the day, some of the 25 workers based at the Regional Operations Centre at PKCT would travel to and from Shaft Site No. 5A as required. For the purpose of this assessment, it is assumed that on a typical day, up to five visits to the Dendrobium Pit Top would be made by workers based at the Regional Operations Centre. This would generate up to 10 vehicle trips per day, which would be spread throughout the day and would not tend to coincide with the peak hours described above.

Construction activity would generate approximately 20 heavy vehicles per day for deliveries of materials and equipment. No visitors would attend Shaft Site No. 5A during construction activity. It is estimated that up to 10% of the daily delivery trips may occur at the same time as the peak movement of the workforce to and from the construction site. As access to Shaft Site No. 5A would be via Picton Road, there would be no restrictions on the times during which heavy vehicles may access the site as occurs for access to the Dendrobium Mine facilities via Cordeaux Road through Mount Kembla.

Table 5.2 summarises the estimated average day vehicle trips generated by the Project construction activity accessing Shaft Site No. 5A via Picton Road and the Cordeaux Dam access road.

Table 5.2: Shaft Site No. 5A Construction Vehicle Trips by Type

	Light	Mini Bus	Heavy	Total
Daily (vehicles per day)				
Workforce	82	0	0	82
Visitor	0	0	0	0
Deliveries	0	0	40	40
Total	82	0	40	122
AM Peak Hour 4:45 am to 5:45 am (vehicles per hour)				
Workforce	45	0	0	45
Visitor	0	0	0	0
Deliveries	0	0	4	4
Total	45	0	4	49
PM Peak Hour 3:45 pm to 4:45 pm (vehicles per hour)				
Workforce	45	0	0	45
Visitor	0	0	0	0
Deliveries	0	0	4	4
Total	45	0	4	49

Trips generated on public roads to and from the Cordeaux Dam access road via Picton Road.

5.1.3 Regional Operations Centre

During construction, approximately 25 execution team workers would be based at the Regional Operations Centre (IMC head office) at the PKCT. These workers would be working a combination of the day shift (typically 6:00 am to 4:00 pm) and office hours, and would make occasional visits throughout the day to the construction sites at the Dendrobium Pit Top and Shaft Site No. 5A. The additional trips generated in and around the PKCT would be negligible in the context of the background traffic in the region, and has therefore not been considered further in this assessment. Allowance has been made for the visiting trips to the Dendrobium Mine construction sites, described in Sections 5.1.1 and 5.1.2.

5.2 Operational Traffic

The Project does not propose any changes to the operational activities at the Kemira Valley Coal Loading Facility, Dendrobium CPP, Dendrobium Shaft Numbers 1, 2 and 3, or along the Kemira Valley Rail Line. Ongoing conditions would be consistent with existing operations (Section 2.4) with no additional traffic anticipated, so these sites are not considered further in this assessment.

5.2.1 Dendrobium Pit Top

The Project operational activities would involve up to an additional 50 development crew workers at the Dendrobium Pit Top. These workers would work similar shifts to the existing operational workforce, with between eight and 12 additional workers during each shift (refer to Table 2.1). Noting that the existing operational workforce is approximately half direct employees and half contractors, the additional workforce may comprise a similar combination of contractors and employees.

There is the potential for contractors to be transported to and from the site by mini-buses, similar to the existing transport arrangements. As a robust assessment of the potential impacts of the Project traffic on the road network, this study has assumed that the additional 50 workers would all travel by car, with an average of 1.1 people per car. This will overestimate the future traffic demands if shuttle buses are implemented for the contractor component of the additional workforce. The traffic generated by the additional workers would be spread across the day consistent with the existing spread of workforce traffic.

The Project activities at the Dendrobium Pit Top may result in some additional visitor and delivery trips on a typical day. This assessment assumes that the 10% increase in workforce at the Dendrobium Pit Top would result in a similar increase in both visitor and delivery trips on a typical day.

Table 5.3 summarises the resulting additional trips assumed to be generated by the Dendrobium Pit Top with the Project operating at its peak operational workforce.

Table 5.3: Dendrobium Pit Top Additional Operational Vehicle Trips by Type

	Light	Mini Bus	Heavy ^A	Total
Daily (vehicles per day)				
Workforce	90	0	0	90
Visitor	1	0	0	1
Deliveries	0	0	4	4
Total	91	0	4	95
AM Peak Hour 4:45 am to 5:45 am (vehicles per hour)				
Workforce	16	0	0	16
Visitor	0	0	0	0
Deliveries	0	0	0	0
Total	16	0	0	16
PM Peak Hour 3:45 pm to 4:45 pm (vehicles per hour)				
Workforce	15	0	0	15
Visitor	1	0	0	1
Deliveries	0	0	1	1
Total	16	0	1	17

^A Heavy vehicles only permitted 7:00 am to 8:00 am, 9:30 am to 2:30 pm and 4:00 pm to 5:00 pm.

5.2.2 Shaft Site No. 5A

Once constructed, Shaft Site No. 5A would be primarily unattended, with access generally limited to intermittent maintenance inspections (up to several times weekly) or for specific maintenance or upgrade works, consistent with the existing Dendrobium Shaft Sites (Section 2.4). The day-to-day traffic generation would be very low, and is not considered further in this assessment.

6 Impacts of the Project

6.1 Future Traffic Volumes

6.1.1 Dendrobium Pit Top

Future traffic volumes on Cordeaux Road at the time of the construction and operational peaks being assessed have been estimated assuming that growth in background (non-mine) traffic may occur at a rate of 1.0% per annum. The background traffic has been estimated by assuming that during the traffic surveys in 2017 (Section 4.4), 95% of the average daily light vehicle traffic and 100% of the average daily heavy vehicle traffic surveyed on the Dendrobium Pit Top Access Road accessed the Dendrobium Pit Top via Cordeaux Road east. These forecasts will tend to overestimate the volume of traffic on Cordeaux Road not associated with the Dendrobium Mine, as it excludes the traffic generated by the visitor car parking area at the Dendrobium Pit Top and by the Kemira Valley Coal Loading Facility during the 2017 surveys. The forecast background traffic on Cordeaux Road in Mount Keira (east of Stones Road) is summarised in Table 6.1.

Table 6.1: Average Weekday Traffic on Cordeaux Road East of Stones Road – No Project

Year	Inbound to Dendrobium Pit Top			Outbound from Dendrobium Pit Top		
	Light	Heavy	Total	Light	Heavy	Total
2017 Surveyed						
Daily ^A	1,646	115	1,761	1,708	99	1,807
5:00 am to 6:00 am ^B	91	6	97	30	2	32
4:00 pm to 5:00 pm ^B	153	8	161	175	7	182
2017 Background Traffic ^C						
Daily ^A	1,422	94	1,516	1,481	67	1,548
5:00 am to 6:00 am ^B	35	1	36	26	1	27
4:00 pm to 5:00 pm ^B	149	8	157	129	3	132
2023 Background Traffic						
Daily ^A	1,510	100	1,610	1,572	71	1,643
5:00 am to 6:00 am ^B	37	1	38	28	1	29
4:00 pm to 5:00 pm ^B	158	8	166	137	3	140
2037 Background Traffic						
Daily ^A	1,736	114	1,850	1,808	82	1,890
5:00 am to 6:00 am ^B	43	1	44	32	1	33
4:00 pm to 5:00 pm ^B	182	10	192	157	3	160

^A vehicles per day

^B vehicles per hour

^C traffic not generated by Dendrobium Pit Top main car park.

Without the Project, the Dendrobium Pit Top would continue to generate traffic consistent with that surveyed in 2021 until cessation of approved mine activity at the end of 2030. With the Project, the Dendrobium Pit Top would generate traffic consistent with that surveyed in 2021 until cessation of approved mine activity at the end of 2040, with additional construction traffic during 2023 (Section 5.1.1), and additional operational traffic until approximately 2037 (Section 5.2.1), after which the operational traffic would decline.

Table 6.2 summarises the forecast daily and peak hourly volumes on Cordeaux Road in Mount Kembla with and without the Project during the years under consideration. This assumes that 95% of the light vehicle traffic and 100% of the heavy vehicle traffic generated by the Dendrobium Pit Top Accesses the Dendrobium Pit Top via Cordeaux Road east. These forecasts assume that the peak mine-generated traffic (surveyed to occur from 4:45 am to 5:45 am and from 3:45 pm to 4:45 pm) coincide with the hourly volumes on Cordeaux Road between 5:00 am and 6:00 am and between 4:00 pm and 5:00 pm.

Table 6.2: Forecast Average Weekday Traffic on Cordeaux Road East of Stones Road

Year	Inbound to Dendrobium Pit Top				Outbound from Dendrobium Pit Top			
	Light	Mini Bus	Heavy	Total	Light	Mini Bus	Heavy	Total
2023 No Project								
Daily ^A	1,893	11	120	2,019	1,954	5	91	2,050
5:00 am to 6:00 am ^B	171	0	1	172	28	0	1	29
4:00 pm to 5:00 pm ^B	158	0	8	166	259	1	5	265
2023 With Project Construction								
Daily ^A	1,929	11	140	2,075	1,990	5	111	2,106
5:00 am to 6:00 am ^B	193	0	1	194	28	0	1	29
4:00 pm to 5:00 pm ^B	158	0	8	166	282	1	5	288
2037 No Project								
Daily ^A	1,736	0	114	1,850	1,808	0	82	1,890
5:00 am to 6:00 am ^B	43	0	1	44	32	0	1	33
4:00 pm to 5:00 pm ^B	182	0	10	192	157	0	3	160
2037 With Project Peak Operational Workforce								
Daily ^A	2,162	6	138	2,306	2,233	5	106	2,344
5:00 am to 6:00 am ^B	192	0	1	193	32	0	1	33
4:00 pm to 5:00 pm ^B	182	0	10	192	293	1	5	299

^A vehicles per day

^B vehicles per hour

6.1.2 Shaft Site No. 5A

Future traffic volumes on Picton Road at the time of peak construction activity at Shaft Site No. 5A have been estimated from the TfNSW data (Section 4.3) on Picton Road near Wilton. That data showed growth of 10% over four years, thus an annual growth rate of 2.5% for traffic on Picton Road has been assumed. The forecast traffic on Picton Road during the peak hours associated with the Project construction activity is summarised in Table 6.3.

Table 6.3: Forecast Average Weekday Traffic on Picton Road near Wilton

Year	Eastbound			Westbound		
	Light	Heavy	Total	Light	Heavy	Total
2021 No Project						
Daily ^A	7,944	3,197	11,141	7,789	3,239	11,028
5:00 am to 6:00 am ^B	177	181	358	454	197	651
4:00 pm to 5:00 pm ^B	801	183	984	615	188	803
2023 No Project						
Daily ^A	8,352	3,361	11,713	8,189	3,405	11,594
5:00 am to 6:00 am ^B	186	190	376	477	207	684
4:00 pm to 5:00 pm ^B	842	192	1,034	647	198	845
2023 With Project^C						
Daily ^A	8,393	3,381	11,774	8,230	3,425	11,655
5:00 am to 6:00 am ^B	186	190	376	522	211	733
4:00 pm to 5:00 pm ^B	887	196	1,083	647	198	845

^A vehicles per day

^B vehicles per hour

^C assumes all Project-generated traffic approaches and departs Cordeaux Dam access road in one direction.

6.2 Operation of Intersections

The operating characteristics of the key intersections have been assessed using SIDRA INTERSECTION 9, an analysis program that determines characteristics of intersection operating conditions including the degree of saturation, average delays and intersection level of service. The degree of saturation, or x-value, is the ratio of the arrival rate of vehicles to the capacity. The average delay, expressed in seconds per vehicle, is measured over all movements at signalised intersections, and over the movement with the highest average delay at roundabout and priority intersections. Average vehicle delay is the commonly used measure of intersection performance defined by TfNSW. Table 6.4 shows the criteria adopted by TfNSW for assessing the level of service of intersections.

Table 6.4: Intersection Level of Service Criteria

Level of Service	Average Delay per Vehicle (seconds per vehicle)	Traffic Signals, Roundabout	Give Way & Stop Sign
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	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

6.2.1 Dendrobium Pit Top

Table 6.5 presents a summary of the peak hour operating characteristics of the intersection of the Dendrobium Pit Top Access Road with Cordeaux Road. Detailed results, including 95th percentile vehicle queues per movement are presented in Appendix C.

Table 6.5: Dendrobium Pit Top and Cordeaux Road Intersection Operating Conditions

Scenario	AM Peak Hour 4:45 am to 5:45 am			PM Peak Hour 3:45 pm to 4:45 pm		
	X-Value	Average Delay ^A	Level of Service	X-Value	Average Delay ^A	Level of Service
2021 – Surveyed	0.08	5.6	A	0.08	5.6	A
2023 – With Project Construction	0.10	5.6	A	0.12	5.6	A
2037 – With Project Operational	0.09	5.6	A	0.11	5.6	A

^A Seconds per vehicle for movement with the highest average delay per vehicle.

The results demonstrate that with the Project-generated traffic, the intersection of Cordeaux Road with the Dendrobium Pit Top Access Road would operate at a good level of service during the peak hours, with short delays to turning traffic and spare capacity.

6.2.2 Shaft Site No. 5A

Under normal circumstances, the grounds of the Cordeaux Dam are open to the public between 10:00 am and 5:00 pm, thus the background traffic during the Project morning peak hour between 4:45 am and 5:45 am would be zero or negligible. During the Project afternoon peak hour between 3:45 pm and 4:45 pm, there is the potential for the public to generate trips on the Cordeaux Dam access road. As the area is currently closed to the public, TTPP has been unable to quantify existing vehicle movements, hence for clarity, the impacts of the short-term construction traffic have been estimated assuming that without the Project, one light vehicle would operate on each movement into and out of the Cordeaux Dam access road during the afternoon peak hour under consideration.

As a robust assessment, it is assumed that all Project-generated traffic would approach or depart to and from the east (i.e. turn left in and right out of the Cordeaux Dam access road), representing the worst case for vehicles departing the site and entering Picton Road. The existing layout of the intersection of Picton Road with the Cordeaux Dam access road allows a vehicle turning right out of the Cordeaux Dam access road to conduct a staged turn. A right-turning vehicle can select a gap and cross the westbound traffic lane, then shelter in the wide median area before selecting a gap to enter the eastbound travel lane. The overall average delay for the right turn movement is therefore the sum of the average delays experienced for both those movements.

The resulting intersection operating conditions are summarised in Table 6.6. Detailed results, including 95th percentile vehicle queues per movement are presented in Appendix C.

Table 6.6: Cordeaux Dam Road and Picton Road Intersection Operating Conditions 2023

Scenario	AM Peak Hour 4:45 am to 5:45 am			PM Peak Hour 3:45 pm to 4:45 pm		
	X-Value	Average Delay ^A	Level of Service	X-Value	Average Delay ^A	Level of Service
2023 – No Project construction	0.44	11.1	A	0.63	19.7	B
2023 – With Project construction	0.44	14.7	B	0.63	23.9	B

Background through traffic on Picton Road 5 am to 6 am, and 4 pm to 5 pm

^A Seconds per vehicle for movement with the highest average delay per vehicle.

The results demonstrate that the intersection of Picton Road with the Cordeaux Dam access road has adequate capacity to accommodate the Project construction traffic with acceptable delays to turning vehicles and spare capacity.

6.3 Car Parking

6.3.1 Dendrobium Pit Top

Additional car parking is proposed to be provided on the southern side of Cordeaux Road, accessed via a new access driveway from Cordeaux Road east of the Dendrobium Pit Top. The capacity of the new car park will be dependent on its detailed design, however it is anticipated that it will accommodate in the order of 100 to 120 car parking spaces. This exceeds the expected increase in the workforce at the Dendrobium Pit Top during both the peak construction phase (approximately 25 workers based on-site and visiting workers based off-site) and operational phase (approximately 50 workers) of the Project. The additional capacity would therefore meet the additional demands generated by the Project, and also provide additional parking to meet the demands of the existing workforce.

It is recommended that the proposed access driveway and car park be designed in accordance with the employee parking requirements of the Australian Standard for Parking Facilities – Off-street car parking, and that a formal pedestrian route between the car park and the main Dendrobium Pit Top would be provided, including a dedicated footpath which directs pedestrians across Cordeaux Road at a suitable location.

6.3.2 Shaft Site No. 5A

A temporary car park would be provided on the Cordeaux Dam access road for the construction workforce at Shaft Site No. 5A, or if preferred by WaterNSW, the existing Cordeaux Dam Picnic Area parking or adjacent area would be utilised (located approximately 700 m further down the access road). The capacity of the temporary car park (or existing picnic area car park) would meet the expected demands at the meeting point, taking into account the peak demand at shift changeover times, when both inbound and outbound workers would be present at the same time.

6.4 Kemira Valley Rail Level Crossings

The Project would continue to make use of the Kemira Valley Rail Line to transport coal from the Kemira Valley Coal Loading Facility to the Dendrobium CPP, with Project trains using the existing level crossings on Central Road south of Cordeaux Road and off Marley Place at Unanderra.

The Project would not increase the number of trains using the rail line and level crossings, rather would extend the number of years over which the trains would use the rail line at the current frequency. The number of vehicles using the level crossing at Central Road would be expected to increase over the life of the Project due to non-specific traffic growth and to a small extent by growth in employees drawn from the local east Unanderra area who might use that level crossing to access Cordeaux Road when travelling to and from the Dendrobium Mine. The number of vehicles using the level crossing at Marley Place is limited by the development on the adjacent land which is accessed via the level crossing and so is not expected to change significantly over the life of the Project.

The probability of a car driver being delayed by a train at a level crossing is a function of the number of vehicles and trains using the crossing, thus would be expected to increase only slightly over the life of the Project at the Central Road level crossing, and to remain at the current level at the Marley Place level crossing. Both crossings have space available for vehicles to queue without blocking through traffic on the nearby roads. The impact of the Project on the operation of the level crossings is low and would not warrant upgrading of the level crossings.

6.5 Road Safety

The review of the road crash history of roads relevant to the Project (Section 4.6) found no particular concerns with the access intersections for the surface facilities or specific locations along the routes investigated. The existing traffic management measures along Cordeaux Road (such as reduced speed limits and speed humps) and the Dendrobium Mine TMP would continue to manage the behaviour of drivers along the route.

6.6 Oversize and Overmass Vehicles

A number of oversize or overmass (OSOM) vehicle movements may be generated on an occasional basis during the life of the Project, consistent with the current Dendrobium Mine operations. OSOM vehicle movements would be associated with the transport of mining equipment and infrastructure to and from the Project. The proposed movement of any OSOM vehicles associated with the Project will conform with the relevant permits obtained in accordance with *Additional Access Conditions Oversize and overmass heavy vehicles and loads* (TfNSW, 2020d), and any other licences and escorts as required by the regulatory authorities.

The movement of OSOM vehicles would be avoided on Cordeaux Road during the times outlined in the TMP.

6.7 Dangerous Goods Vehicles

Dangerous goods required for the Project would be transported in accordance with the relevant legislation, including *Dangerous Goods (Road and Rail Transport) Act 2008*, *Dangerous Goods (Road and Rail Transport) Regulation 2014* and *Dangerous Goods (Road and Rail Transport) Amendment (Model Law) Regulation 2020*, reflecting the new edition of the *Australian Code for the Transport of Dangerous Goods by Road & Rail* (National Transport Commission, 2020) for implementation in NSW.

The transportation, handling and storage of all dangerous goods at the site will be conducted in accordance with the requirements of the relevant Australian Standards, driver and vehicle licencing requirements, and the current version of the Australian Dangerous Goods Code.

6.8 Construction Water Transportation (Option)

As part of the Project, water to be used for construction activities at Shaft Site No. 5A may be required to be transported by road from sources in the local region, in the absence of alternative water supply options. The implications of this transportation, if required, on the road transport environment have been reviewed, based on the following:

- water would be transported using a fleet of six small rigid tanker trucks, with a capacity of 10,000 litres per truck;
- each truck would make three trips per day to Shaft Site No. 5A; and
- transportation of water would be limited to between 8:00 am and 5:00 pm, Monday to Saturday.

If required, water transportation during the construction stage for Shaft Site No. 5A would therefore generate up to 36 vehicle trips per day on the Cordeaux Dam access road and Picton Road, with an average of approximately four truck movements per hour (two inbound and two outbound). It is likely that the water would be sourced from Picton or Wilton, so trucks would travel on Picton Road from the west of the Cordeaux Dam access road.

The primary impact of this water transportation by road, if required, would be at the intersection of Cordeaux Dam access road and Picton Road. To assess the operation of that intersection, a robust scenario has been considered in which all six trucks arrive and depart the site in one hour, generating 12 vehicle trips in one hour.

If required, the transportation of water to Shaft Site No. 5A by road would be restricted to after 8:00am, so it would not coincide with the morning peak for traffic generated by the Project. This assessment has therefore considered the impacts during the busiest morning hour on Picton Road that coincides with the water haulage hours, being 8:00am to 9:00am (sourced from TfNSW, 2020c). The assessment assumes that during the morning on-street peak hour, the water trucking may coincide with up to four delivery truck movements (two inbound and two outbound, all to and from the east) associated with the Project construction activity.

The transportation of water would continue until 5:00pm, and so may occur at the same time as the evening peak of Project-generated traffic. The water trucking scenario has therefore been assessed assuming that the water haulage peak may coincide with the construction activity peak hour traffic generation in the evening.

The operation of the intersection has been analysed using SIDRA INTERSECTION 9 (refer to Section 6.2), and the results summarised in Table 6.7. Detailed results are presented in Appendix C.

Table 6.7: Cordeaux Dam and Picton Road Intersection 2023 with Water Transportation

Cordeaux Dam Access Road and Picton Road	X-Value	Average Delay ^A	Level of Service
With Project and Water Transportation from West			
8:00am to 9:00am	0.506	31.6	C
4:00pm to 5:00pm	0.626	24.0	B
With Project and Water Transportation from East			
8:00am to 9:00am	0.506	41.9	C
4:00pm to 5:00pm	0.626	31.0	C

^A Seconds per vehicle for movement with the highest average delay per vehicle.

The results in Table 6.7 indicate that the intersection of Picton Road with the Cordeaux Dam access road would have adequate capacity to accommodate the additional water haulage trucks if needed, with average vehicle delays being within the acceptable range. No specific management or other mitigation measures would be required to manage the movement of water haulage trucks to and from Shaft Site No. 5A should this option be required.

6.9 Mitigation Measures

Based on the findings of this assessment, the impacts of the Project's traffic on the road system can be satisfactorily accommodated while maintaining satisfactory operational conditions, with the following measures recommended:

- review the existing Dendrobium Mine TMP prior to commencement of the Project and periodically throughout the life of the Project to determine any need for revisions, with a focus on road safety; and
- the proposed car park off Cordeaux Road and its access be designed in accordance with the employee car parking requirements of Australian Standard 2890.1, with a clear pedestrian route provided between the car park and the Dendrobium Pit Top area.

The measures above are intended to provide safe traffic movement for all road users by minimising the risks posed by the interacting components of the road transport system, consistent with the Safe System principles.

7 Summary and Conclusions

7.1 Summary

Dendrobium Mine

- The Dendrobium Mine is an underground coal mine situated in the Southern Coalfield of NSW approximately 8 km west of Wollongong. Existing surface facilities include the Dendrobium Pit Top, Kemira Valley Coal Loading Facility, Kemira Valley Rail Line, Dendrobium CPP, and Dendrobium Shaft Numbers 1, 2 and 3.
- ROM coal is transported from the underground areas via a tunnel to the Kemira Valley Coal Loading Facility then to the Dendrobium CPP via the Kemira Valley Rail Line, then to the Port Kembla Steelworks or PKCT for export.
- Access to the Dendrobium Pit Top is off Cordeaux Road, access to the Kemira Valley Coal Loading Facility is off Stones Road, and access to the Dendrobium CPP is via Flinders Street (in the Port Kembla Steelworks precinct).
- Dendrobium Mine traffic is managed by the *Dendrobium Mine Traffic Management Plan* and the *Dendrobium Drivers' Code of Conduct*. To minimise the impacts of mine-generated traffic on local residents, heavy vehicle access to the Dendrobium Pit Top is only permitted on weekdays from 7:00 am to 8:00 am, 9:30 am to 2:30 pm, and 4:00 pm to 5:00 pm, and from 8:00 am to 1:00 pm on Saturdays.

Dendrobium Mine Extension Project

- The Project would extend underground mining operations in a new underground mining area (Area 5) until approximately 2035, and use of the Dendrobium Pit Top, Kemira Valley Coal Loading Facility, Dendrobium CPP and Dendrobium Shafts to 2041.
- Coal handling, processing and transportation activities would continue consistent with current conditions.
- Project construction activity would require a short term workforce of approximately 100 FTE workers, and Project operational activity would require the ongoing employment of the existing operational workforce plus an additional 50 workers based at the Dendrobium Pit Top.
- Construction activity would occur at the Dendrobium Pit Top and Shaft Site No. 5A, which would be accessed via the Cordeaux Dam access road.
- A temporary car park would be provided adjacent to the Cordeaux Dam access road (or at the existing Cordeaux Dam Picnic Area parking area or adjacent area if preferred by WaterNSW). The construction workforce would be transported from the temporary car park to the construction site via dedicated work vehicles, using fire trails and unsealed access roads.

Existing Road Environment

- Access for the Dendrobium Pit Top is via Cordeaux Road, a local road that provides access from Kembla Heights at Figtree via Cordeaux Heights and Mount Kembla.
- The Cordeaux Dam access road is accessed via Picton Road, a State Road which performs a significant role in freight transport for the region. TfNSW is currently planning the duplication of Picton Road.
- A review of the 5-year road crash history of key roads relevant to the Project found that once crash occurred at the intersection of Cordeaux Road with the Dendrobium Pit Top access, and no crashes occurred at or near the intersection of Picton Road with the Cordeaux Dam access road.
- The Dendrobium Pit Top currently generates 864 vehicle trips per weekday, 143 vehicle trips during the morning peak hour (4:45am to 5:45 am) and 133 vehicle trips per hour during the evening peak hour (3:45 pm to 4:45 pm).
- The Kemira Valley Coal Loading Facility generates 38 vehicle trips per weekday, six vehicle trips during the morning peak hour (7:00 am to 8:00 am) and three vehicle trips per hour during the evening peak hour (3:00 pm to 4:00 pm).
- The Dendrobium CPP generates approximately 42 vehicle trips per day during typical operations.

Project Traffic Generation

- During the construction phase, the Project is forecast to generate approximately 96 vehicle trips per day at the Dendrobium Pit Top, with 23 vehicle trips during the morning peak hour (4:45 am to 5:45 am) and 26 vehicle trips per hour during the evening peak (3:45 pm to 4:45 pm).
- During the construction phase, the Project is forecast to generate approximately 122 vehicle trips per day on public roads to and from a temporary parking area on the Cordeaux Dam access road, with 49 vehicle trips during the morning peak hour (4:45 am to 5:45 am) and evening peak (3:45 pm to 4:45 pm).
- During the construction phase, approximately 25 execution team workers would be based at the Regional Operations Centre at the PKCT. Allowance has been made in this assessment for trips made by these workers to the Dendrobium Mine construction sites. The additional trips generated in and around the PKCT would be negligible in the context of the background traffic in the region, and has therefore not been considered further.
- During the operational phase with the peak operational workforce present, the Project is forecast to generate approximately 95 vehicle trips per day at the Dendrobium Pit Top, with 16 vehicle trips during the morning peak hour (4:45 am to 5:45 am) and 17 vehicle trips per hour during the evening peak (3:45 pm to 4:45 pm).

- Once constructed, the Dendrobium Shaft Site No. 5A would be primarily unattended, and its day-to-day traffic generation would be very low, and has not been considered further in this assessment.

Impacts of the Project

- Future traffic volumes on Cordeaux Road have been forecast with and without the Project, including growth in background (non-mine) traffic, tabulated below.

Table 7.1: Cordeaux Road East of Stones Road Future Traffic Volumes

Cordeaux Road east of Stones Road	Daily (vehicles per day)	AM Peak Hour (vehicles per hour)	PM Peak Hour (vehicles per hour)
2017 Surveyed	3,568	129	343
2023 No Project	4,069	201	431
2023 with Project Construction	4,181	223	454
2037 No Project (mining operations ceased)	3,740	77	352
2027 with Project peak operational workforce	4,650	226	491

- With the combined effects of background traffic growth and Project-generated traffic, the intersection of Cordeaux Road with the Dendrobium Pit Top Access would operate at a good level of service during the peak hours during both the construction and operational phases.
- During the construction phase, and allowing for background growth in traffic on Picton Road, the intersection of Picton Road with Cordeaux Dam access road would operate at satisfactory levels of service during the peak hours.
- Additional car parking for the Dendrobium Pit Top is proposed on the southern side of Cordeaux Road, accommodating in the order of 100 to 120 car parking spaces, which exceeds the additional demand expected as a result of the Project.
- The capacity of the temporary car park on the Cordeaux Dam access road would be developed to accommodate the expected demands at shift changeover times.
- The Project would not increase the number of trains on the Kemira Valley Rail Line using the level crossings.
- The existing traffic management measures on Cordeaux Road (such as reduced speed limits and speed humps) and the Dendrobium TMP would continue to manage the behaviour of drivers.
- Any OSOM or dangerous good vehicle movements generated as a result of the Project would conform with the relevant regulatory requirements, and would be avoided on Cordeaux Road during the times outlined in the Dendrobium TMP.
- Trucking of water to Shaft Site No. 5A by a fleet of six trucks each making three deliveries per day between 8:00am and 5:00pm Monday to Saturday would be undertaken during Project construction activities, if required. The operation of the

intersection of Picton Road with the Cordeaux Dam access road would remain acceptable with the addition of water trucks under these circumstances.

- The following mitigation measures are recommended for the Project:
 - review the existing Dendrobium Mine TMP prior to commencement of the Project and periodically throughout the life of the Project to determine any need for revision with a focus on road safety; and
 - the proposed car park off Cordeaux Road and its access be designed in accordance with the employee car parking requirements of Australian Standard 2890.1, with a clear pedestrian route provided between the car park and the Dendrobium Pit Top area.

7.2 Conclusions

Based on analysis and discussions presented within this report, it is concluded that subject to the mitigation measures described above and in Section 6.9, the Project can be satisfactorily accommodated by the road network, with acceptable impacts on the capacity, efficiency and safety of the road network.

References

Australian Road Research Board (2011), *Road Safety Risk Reporter 15: Safety on rural roads: run-off-road, head-on and intersection crashes*.

Illawarra Coal (2021), *Dendrobium Mine Traffic Management Plan*.

Infrastructure Australia (2017), *Project Business Case Evaluation Maldon-Dombarton Rail Link*.

National Transport Commission (2020), *Australian Code for the Transport of Dangerous Goods by Road & Rail*.

Transport for New South Wales (2018), *NSW Freight and Ports Plan for 2018-2023*.

Transport for New South Wales (2020a), *Draft Illawarra-Shoalhaven Regional Transport Plan*.

Transport for New South Wales (2020b), <https://roads-waterways.transport.nsw.gov.au/about/news-events/news/ministerial/2020/201109-roads-funding-in-nsw-budget.html>

Transport for New South Wales (2020c), <https://roads-waterways.transport.nsw.gov.au/about/corporate-publications/statistics/traffic-volumes/aadt-map/index.html#/?z=6> (accessed 30 July 2021).

Transport for New South Wales (2020d), *Additional Access Conditions Oversize and overmass heavy vehicles and loads*.

Appendix A

Traffic Surveys

Job No	N3060
Client	
Site	Dendrobium Mine Access - north of Cordeaux Rd
Location	Mt Kembla
Site No	1
Start Date	30-Mar-17
Description	Volume Summary
Direction	Combined



Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	3-Apr	4-Apr	5-Apr	30-Mar	31-Mar	1-Apr	2-Apr		
AM Peak	72	82	77	67	53	37	43		
PM Peak	60	88	57	57	40	28	42	528	433
0:00	0	28	24	37	14	1	1	21	15
1:00	0	2	0	0	2	0	0	1	1
2:00	1	0	0	0	1	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	6	8	6	8	9	7	6	7	7
5:00	72	82	77	67	47	37	43	69	61
6:00	14	34	12	16	7	9	4	17	14
7:00	25	66	49	52	53	13	7	49	38
8:00	41	35	45	38	23	21	20	36	32
9:00	19	14	9	16	25	0	4	17	12
10:00	24	30	19	23	23	3	6	24	18
11:00	26	13	20	18	20	1	2	19	14
12:00	42	27	37	33	18	1	0	31	23
13:00	53	38	41	36	18	1	0	37	27
14:00	20	24	13	21	17	2	1	19	14
15:00	39	28	42	32	12	3	2	31	23
16:00	60	88	57	57	18	4	1	56	41
17:00	15	15	17	16	22	18	19	17	17
18:00	3	0	7	2	40	26	42	10	17
19:00	1	0	1	0	28	15	26	6	10
20:00	5	5	7	3	3	28	3	5	8
21:00	40	45	44	43	1	3	4	35	26
22:00	4	4	5	4	0	2	1	3	3
23:00	16	15	37	23	0	0	0	18	13
Total	526	601	569	545	401	195	192	528	433

7-19	367	378	356	344	289	93	104	347	276
6-22	427	462	420	406	328	148	141	409	333
6-24	447	481	462	433	328	150	142	430	349
0-24	526	601	569	545	401	195	192	528	433

Job No	N3060
Client	
Site	Kemira Valley Access Rd - -34.42351 150.82701
Location	Mt Kembla
Site No	2
Start Date	30-Mar-17
Description	Volume Summary
Direction	Combined



Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	3-Apr	4-Apr	5-Apr	30-Mar	31-Mar	1-Apr	2-Apr		
AM Peak	9	11	5	5	6	2	2		
PM Peak	6	4	5	5	4	4	4	35	30
0:00	2	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	0	0	0	1	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0
6:00	0	1	4	3	1	2	2	2	2
7:00	5	11	5	4	1	0	0	5	4
8:00	2	4	2	3	0	0	0	2	2
9:00	1	3	1	5	1	0	2	2	2
10:00	0	4	3	2	3	0	0	2	2
11:00	9	0	2	4	6	0	0	4	3
12:00	0	1	4	0	1	0	1	1	1
13:00	2	0	1	5	0	4	1	2	2
14:00	6	3	2	2	4	2	2	3	3
15:00	4	2	4	3	0	2	4	3	3
16:00	0	0	5	2	2	4	1	2	2
17:00	0	0	5	0	4	2	3	2	2
18:00	0	4	2	0	0	0	0	1	1
19:00	0	2	0	0	0	0	2	0	1
20:00	0	0	2	0	2	0	2	1	1
21:00	0	0	2	0	0	2	0	0	1
22:00	2	2	0	2	0	0	0	1	1
23:00	0	0	0	0	0	0	0	0	0
Total	33	37	44	36	25	18	20	35	30

7-19	29	32	36	30	22	14	14	30	25
6-22	29	35	44	33	25	18	20	33	29
6-24	31	37	44	35	25	18	20	34	30
0-24	33	37	44	36	25	18	20	35	30

Job No	N3060
Client	
Site	Cordeaux Rd - approx 450m east of Stones Rd
Location	Mt Kembla
Site No	3
Start Date	30-Mar-17
Description	Volume Summary
Direction	Combined



Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	3-Apr	4-Apr	5-Apr	30-Mar	31-Mar	1-Apr	2-Apr		
AM Peak	317	342	331	347	310	213	228		
PM Peak	320	380	384	324	321	275	244	3569	3450
0:00	2	44	43	67	34	64	51	38	44
1:00	3	5	7	14	11	22	31	8	13
2:00	5	3	7	4	6	14	8	5	7
3:00	6	4	8	7	7	4	6	6	6
4:00	28	30	21	20	23	17	13	24	22
5:00	130	151	150	125	91	58	60	129	109
6:00	129	131	126	128	102	56	50	123	103
7:00	229	259	255	232	214	80	62	238	190
8:00	317	342	331	347	310	162	159	329	281
9:00	198	151	211	175	180	193	176	183	183
10:00	193	178	148	149	198	197	204	173	181
11:00	148	163	160	158	202	213	228	166	182
12:00	166	157	195	176	192	275	219	177	197
13:00	191	184	208	197	167	257	237	189	206
14:00	208	198	190	224	205	238	236	205	214
15:00	258	282	327	278	321	208	244	293	274
16:00	320	380	384	324	302	251	215	342	311
17:00	242	322	308	275	312	267	227	292	279
18:00	159	198	232	203	303	258	165	219	217
19:00	94	148	124	113	218	155	123	139	139
20:00	74	80	123	89	103	115	73	94	94
21:00	85	105	101	130	107	94	62	106	98
22:00	26	32	32	35	109	97	34	47	52
23:00	19	27	67	39	57	117	11	42	48
Total	3230	3574	3758	3509	3774	3412	2894	3569	3450

7-19	2629	2814	2949	2738	2906	2599	2372	2807	2715
6-22	3011	3278	3423	3198	3436	3019	2680	3269	3149
6-24	3056	3337	3522	3272	3602	3233	2725	3358	3250
0-24	3230	3574	3758	3509	3774	3412	2894	3569	3450

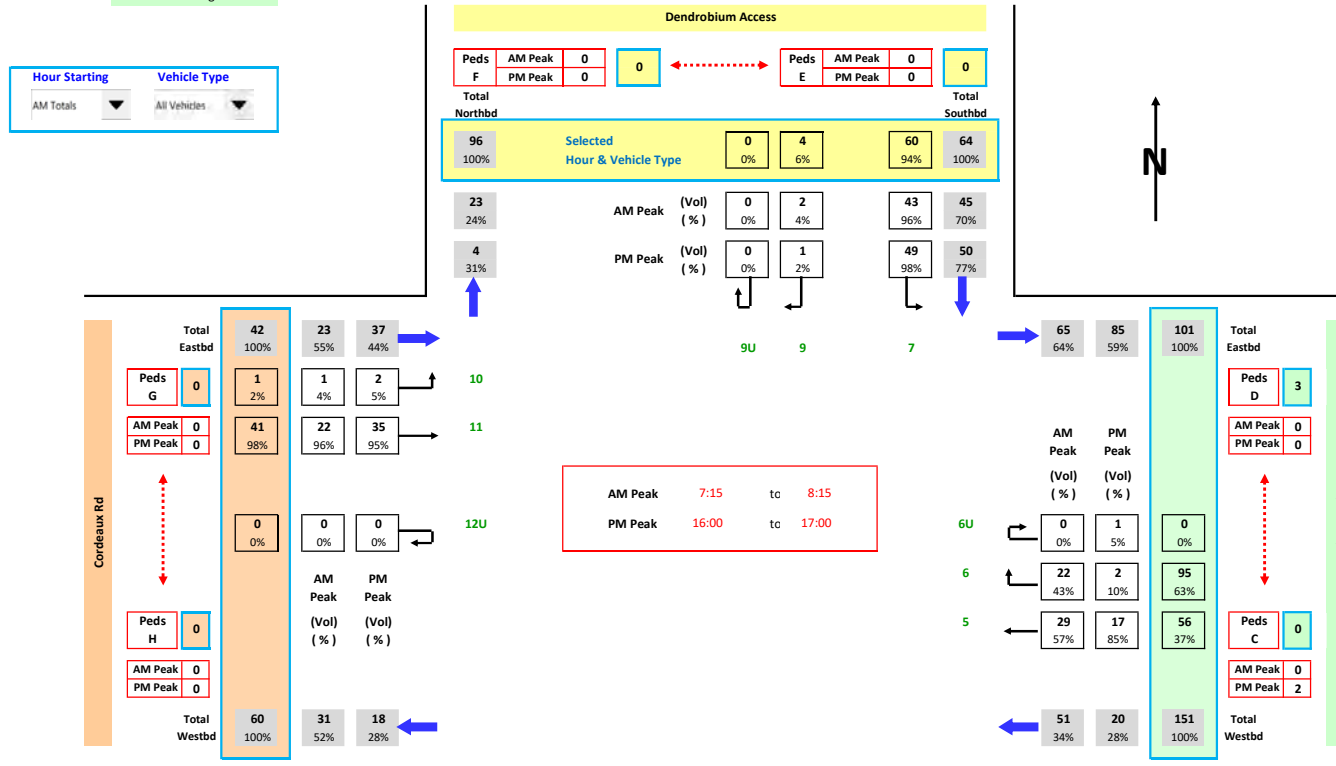
Job No	N3060
Client	
Site	Cordeaux Pit Access Rd - Parralell with Picton Rd
Location	Mt Kembla
Site No	4
Start Date	30-Mar-17
Description	Volume Summary
Direction	Combined



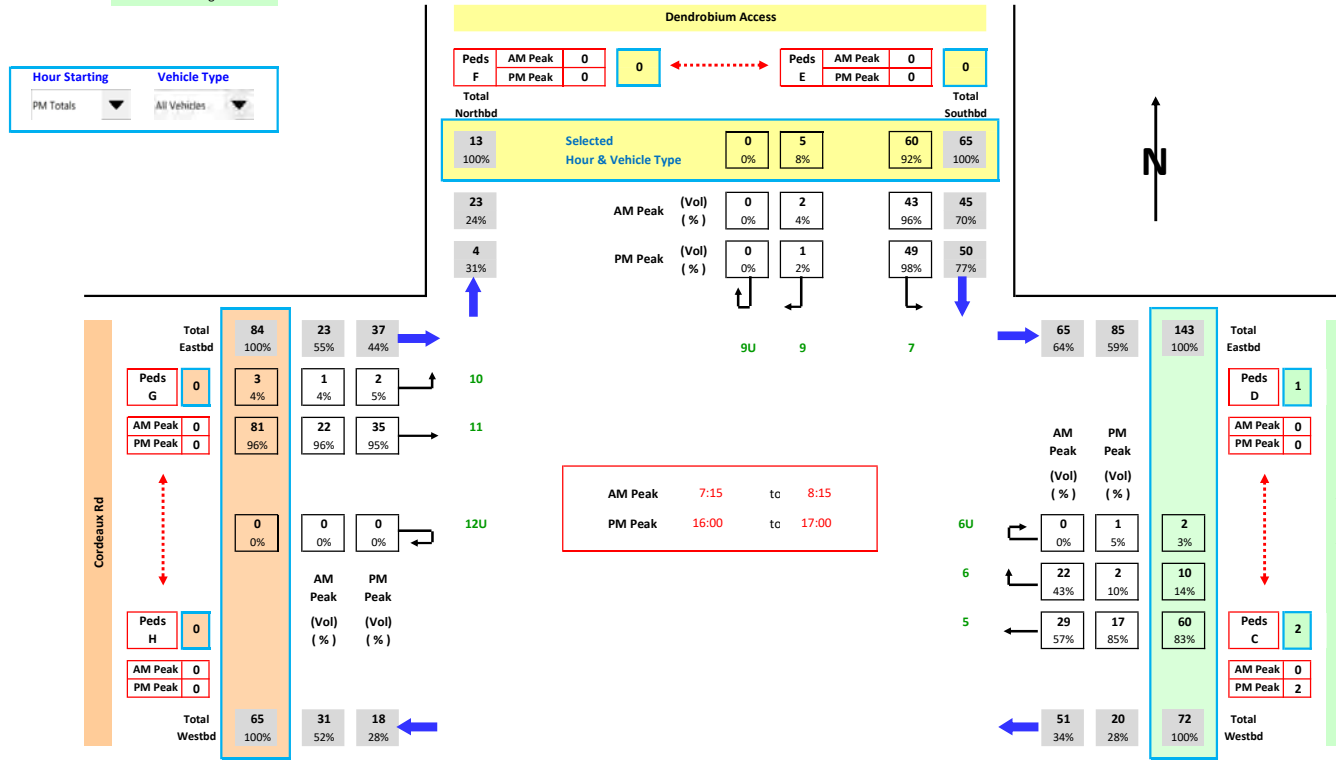
Hour Starting	Day of Week							W'Day Ave 103	7 Day Ave 75
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	3-Apr	4-Apr	5-Apr	30-Mar	31-Mar	1-Apr	2-Apr		
AM Peak	12	19	12	15	17	2	2		
PM Peak	15	16	21	11	13	1	1		
0:00	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
5:00	2	1	1	2	1	2	0	1	1
6:00	12	19	12	7	5	0	2	11	8
7:00	12	14	12	15	17	2	0	14	10
8:00	11	13	12	6	5	0	0	9	7
9:00	4	11	5	10	8	0	0	8	5
10:00	10	6	8	14	4	0	0	8	6
11:00	5	5	3	8	4	0	0	5	4
12:00	6	1	12	8	4	0	0	6	4
13:00	13	4	13	0	1	0	0	6	4
14:00	4	11	5	4	8	0	0	6	5
15:00	9	14	21	11	13	0	0	14	10
16:00	15	16	18	10	2	0	1	12	9
17:00	3	1	1	1	1	1	1	1	1
18:00	1	0	0	1	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0
Total	107	116	123	97	73	6	4	103	75

7-19	93	96	110	88	67	4	2	91	66
6-22	105	115	122	95	72	4	4	102	74
6-24	105	115	122	95	72	4	4	102	74
0-24	107	116	123	97	73	6	4	103	75

Day/Date : Thursday, 30th Mar 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Day/Date : Thursday, 30th Mar 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Job No. : N3060
 Client :
 Suburb : Mt Kembla
 Location : 2. Cordeaux Rd / Stones Rd
 Day/Date : Thursday, 30th Mar 2017
 Weather : Fine
 Description : Classified Intersection Count
 : Intersection Diagram

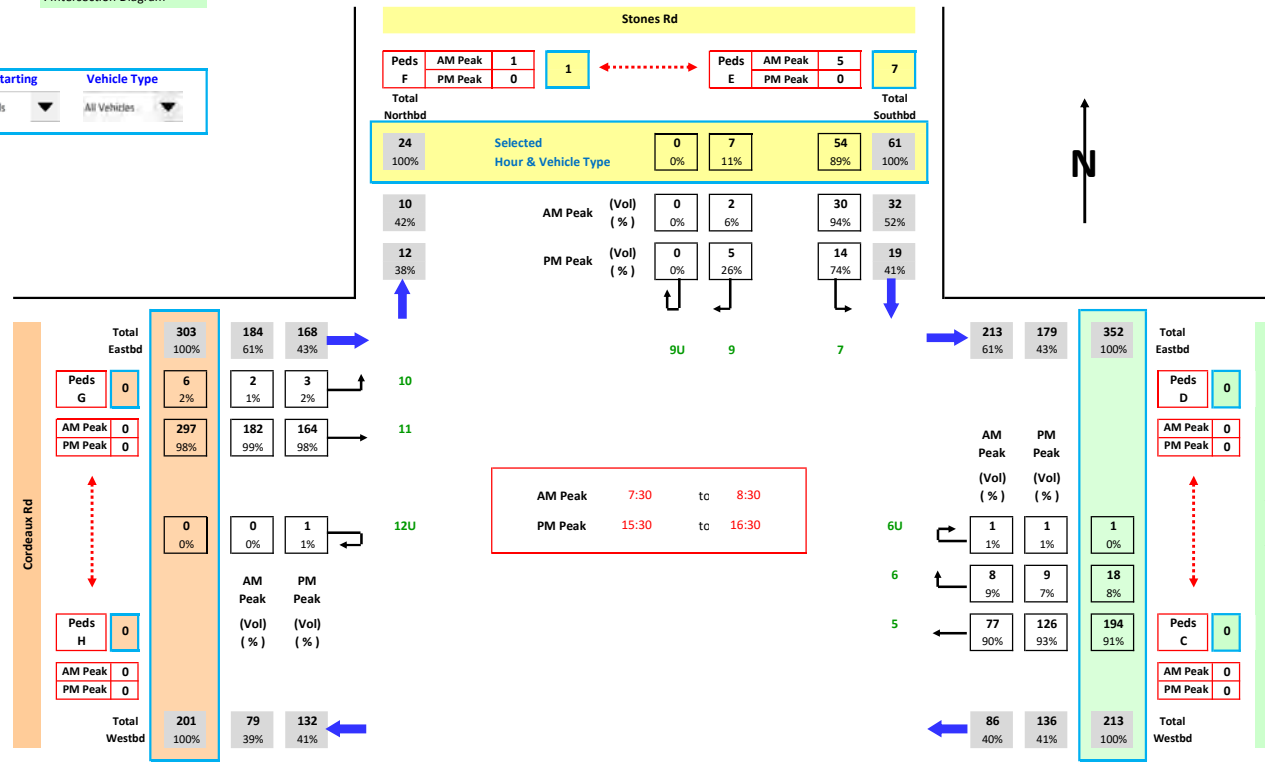


Hour Starting

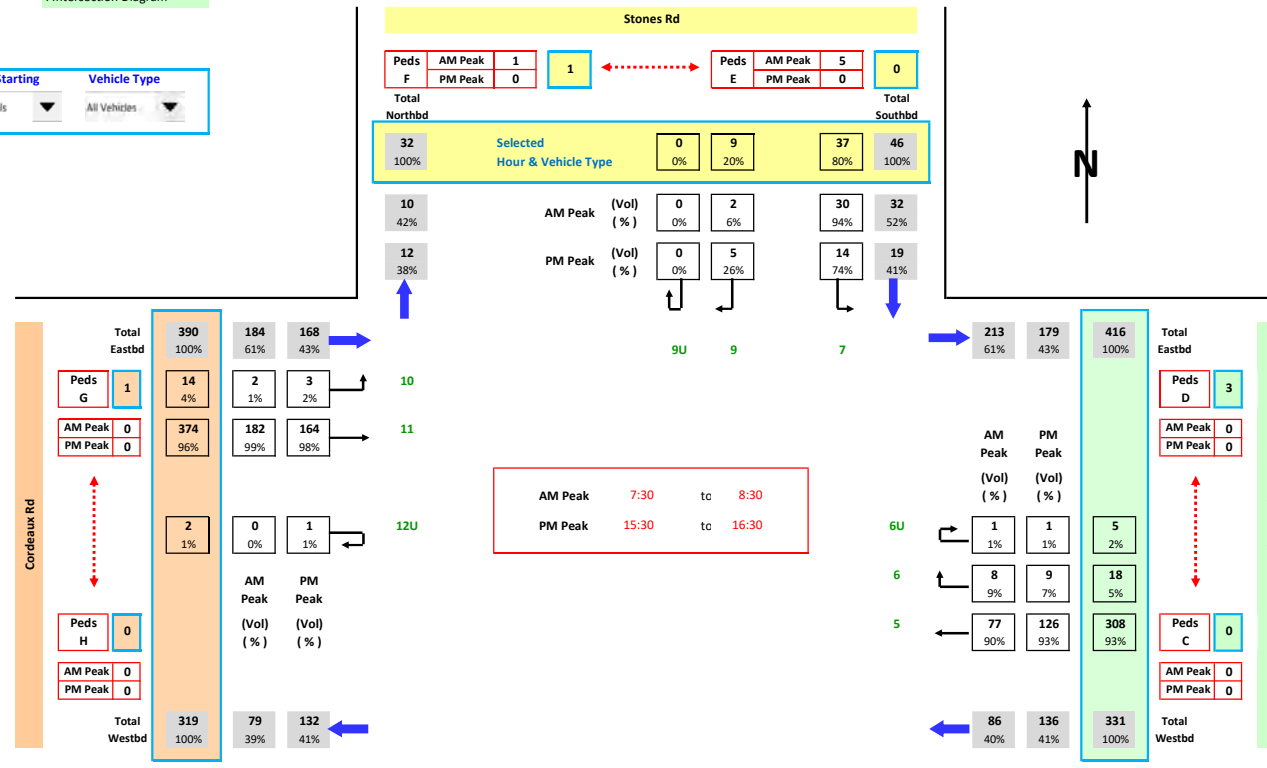
Vehicle Type

AM Totals

All Vehicles



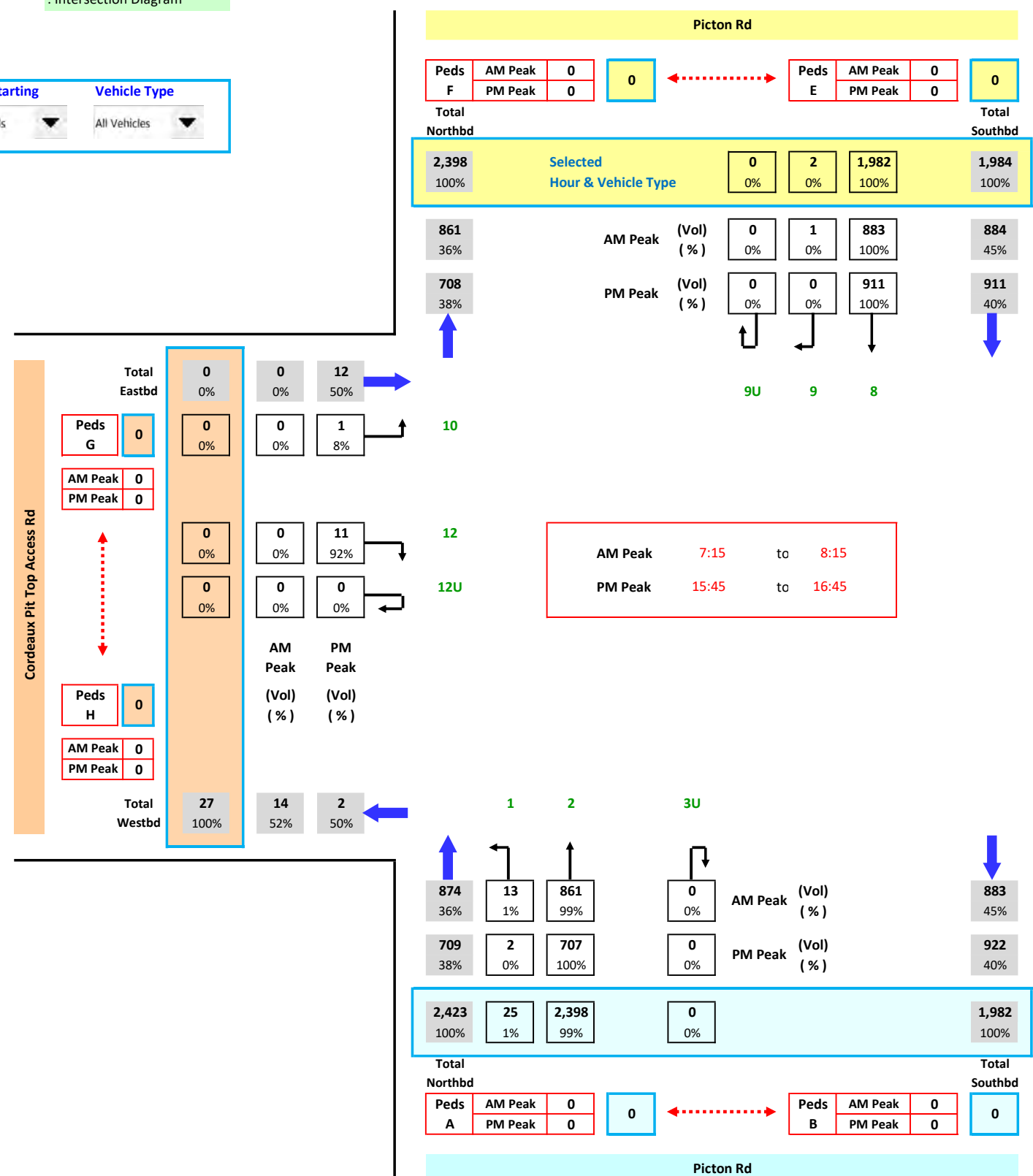
Day/Date : Thursday, 30th Mar 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Day/Date : Thursday, 30th Mar 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



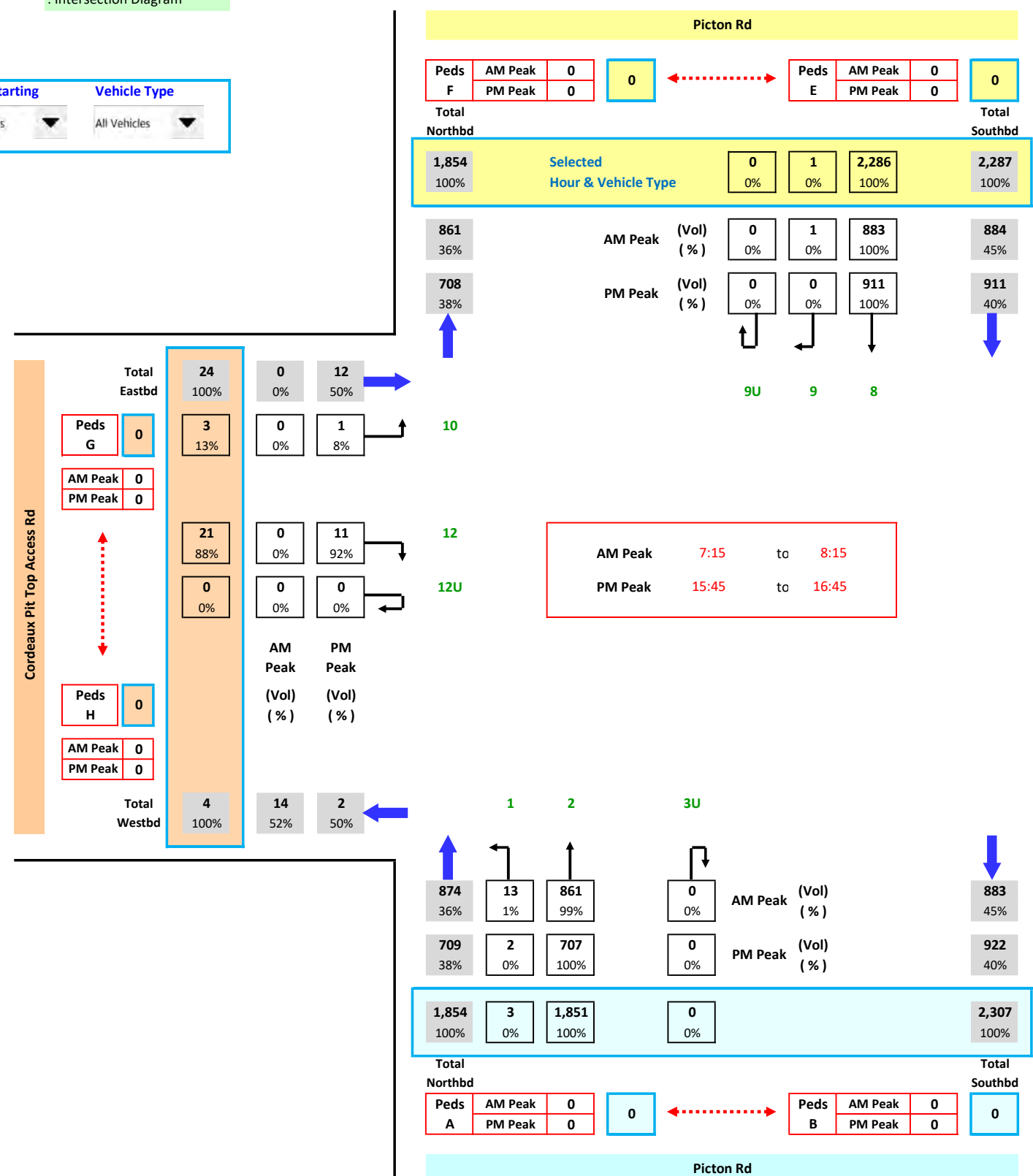
Hour Starting: AM Totals
Vehicle Type: All Vehicles



Day/Date : Thursday, 30th Mar 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: PM Totals
Vehicle Type: All Vehicles

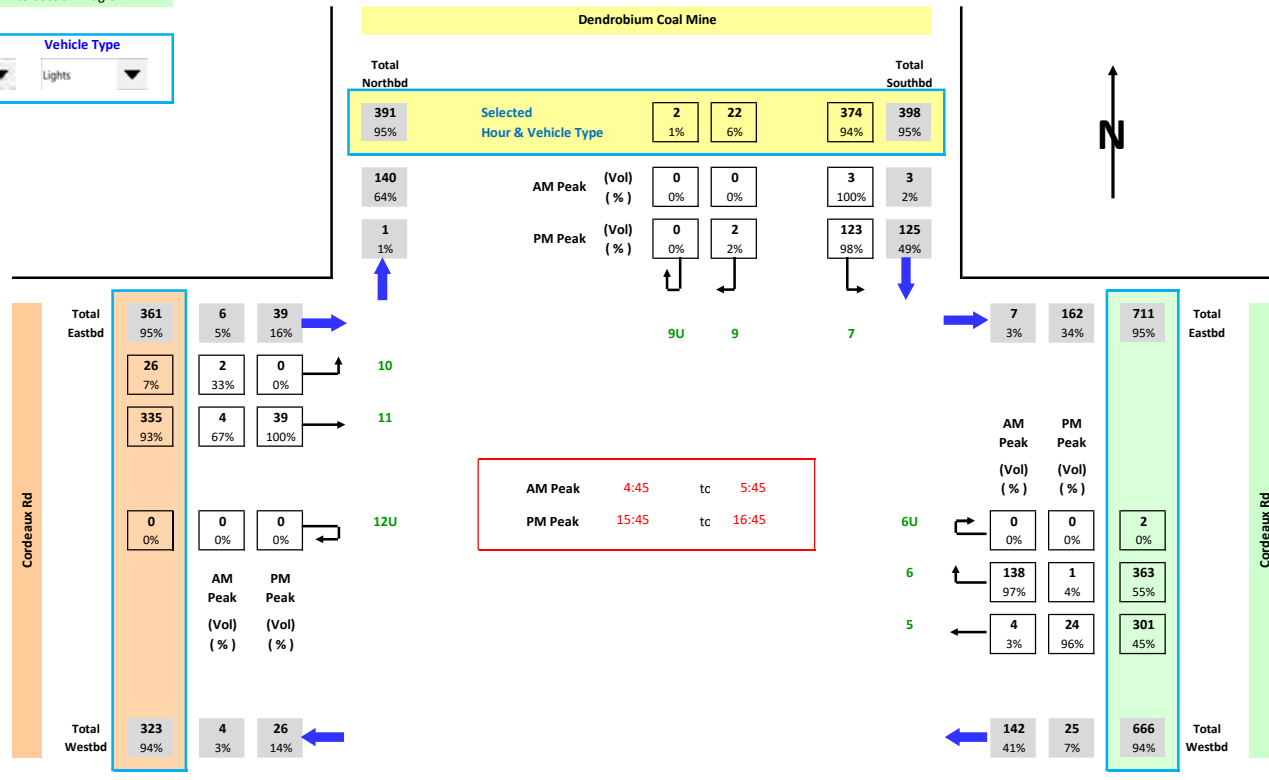


Job No. : AUNSW686
Client : The Transport Planning Partnership Pty Ltd
Suburb : Mt Kembla
Location : 1. Cordeaux Rd / Dendrobium Coal Mine

Day/Date : Wed, 21st July 2021
Weather : Fine
Description : Classified Intersection Count
 : Intersection Diagram



Hour Starting **Vehicle Type**

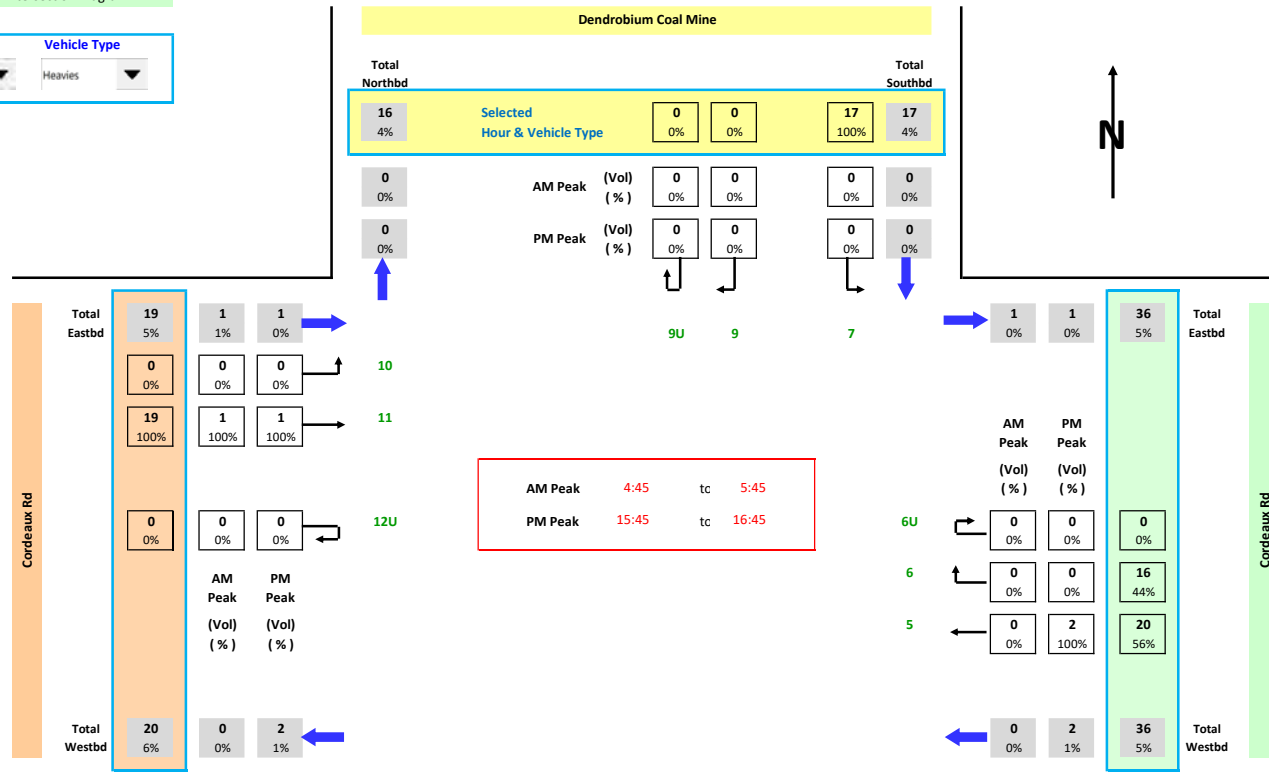


Job No. : AUNSW686
Client : The Transport Planning Partnership Pty Ltd
Suburb : Mt Kembla
Location : 1. Cordeaux Rd / Dendrobium Coal Mine

Day/Date : Wed, 21st July 2021
Weather : Fine
Description : Classified Intersection Count
 : Intersection Diagram



Hour Starting : 24hr Totals
Vehicle Type : Heavies



Job No. : AUNSW686
Client : The Transport Planning Partnership Pty Ltd
Suburb : Mt Kembla
Location : 1. Cordeaux Rd / Dendrobium Coal Mine

Day/Date : Wed, 21st July 2021
Weather : Fine
Description : Classified Intersection Count
 : Intersection Diagram

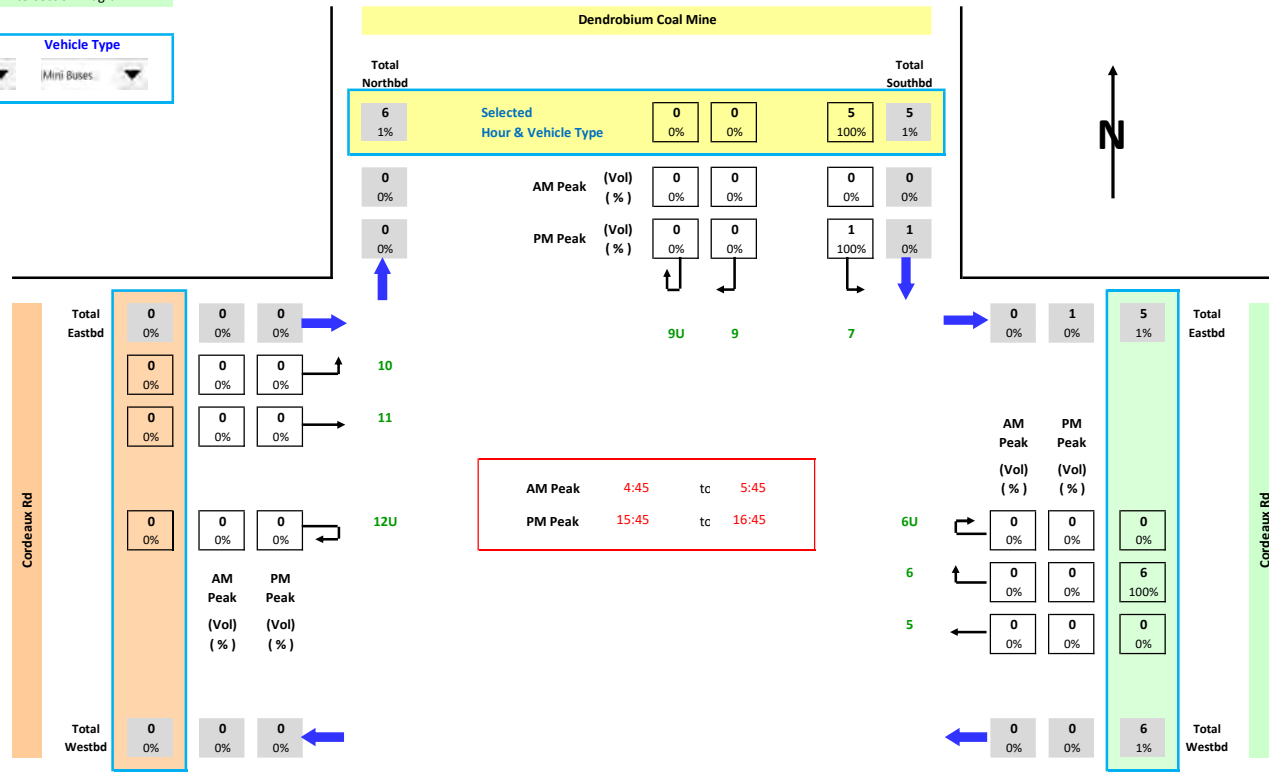


Hour Starting

24hr Totals

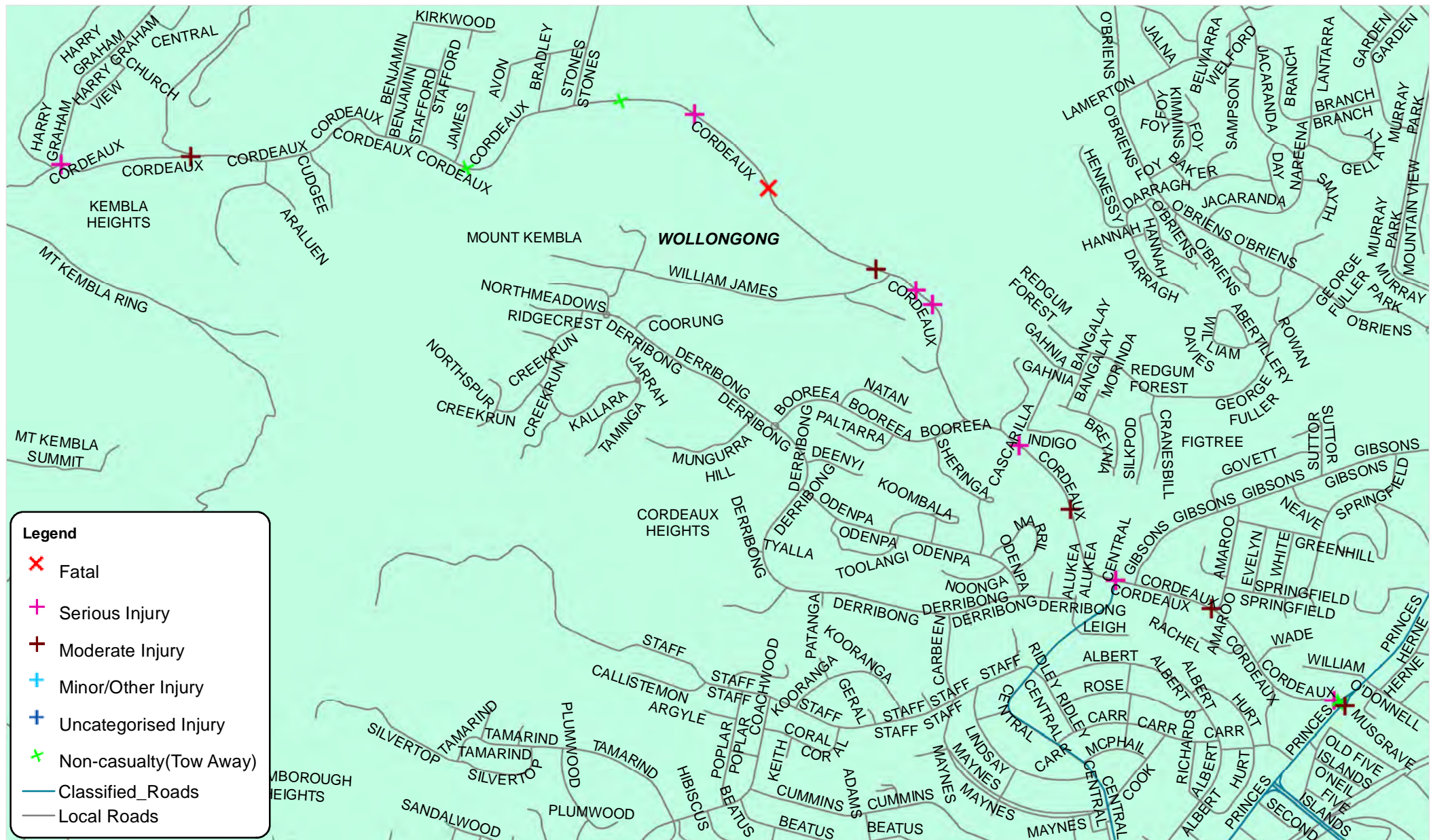
Vehicle Type

Mini Buses



Appendix B

Road Crash Data



Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong FIGTREE PRINCES HWY	1099243	E60772004						RUM: 21 Right through						No. of TUs involved: 2												
		P	13/04/16	Wed	1530	0 m	at	CORDEAUX RD	Rdb	Str	Fine	Dry	60	CAR	S in PRINCES HWY	Turning right	35 M	MV driv.	N	NC	0	0	0	0	0	S
														WAG	N in PRINCES HWY	Proceeding in lane	Unk M	MV driv.	N							
	1176895	E68540157						RUM: 73 Off rd right => obj						No. of TUs involved: 1		Signpost										
		P	13/07/18	Fri	0930	0 m	at	CORDEAUX RD	Rdb	Str	Fine	Dry	60	CAR	S in PRINCES HWY	Proceeding in lane	31 M	MV driv.	M	MC	0	0	1	0	0	
South Wollongong MOUNT KEMBLA CORDEAUX RD	1105265	E119300102						RUM: 32 Right rear						No. of TUs involved: 2												
		S	19/05/16	Thu	1420	0 m	at	CORDEAUX RD	Rdb	Str	Fine	Dry	60	CAR	E in CORDEAUX RD	Proceeding in lane	36 F	MV driv.	N	NC	0	0	0	0	0	
														CAR	E in CORDEAUX RD	Turning right	63 F	MV driv.	N							
	1100558	E60939345						RUM: 67 Struck animal						No. of TUs involved: 1		Other large animal										
		P	26/03/16	Sat	0540	100 m	E	WILLIAM JAMES DR	2-way	Cur	Fine	Dry	60	P/C	E in CORDEAUX RD	Proceeding in lane	55 M	P/C rider	S	SC	0	1	0	0	0	
South Wollongong MOUNT KEMBLA CORDEAUX RD	1092535	E60512962						RUM: 73 Off rd right => obj						No. of TUs involved: 1		Fence										
		P	18/01/16	Mon	1500	400 m	E	WILLIAM JAMES DR	2-way	Str	Fine	Dry	60	CAR	E in CORDEAUX RD	Proceeding in lane	58 M	MV driv.	S	SC	0	1	0	0	0	
	1128056	E63198412						RUM: 80 Off left/right bend						No. of TUs involved: 1												
		P	22/01/17	Sun	2320	400 m	W	BOOREEA BVD	2-way	Cur	Fine	Dry	60	CAR	E in CORDEAUX RD	Proceeding in lane	17 F	MV driv.	S	SC	0	1	0	0	0	S
South Wollongong MOUNT KEMBLA CORDEAUX RD	1088975	E60839478						RUM: 81 Off left/rt bnd=>obj						No. of TUs involved: 1		Tree/bush										
		S	20/12/15	Sun	1816	0 m	at	NUMBER 295 HN	2-way	Cur	Fine	Dry	60	4WD	W in CORDEAUX RD	Proceeding in lane	61 M	MV driv.	N	NC	0	0	0	0	0	S
South Wollongong MOUNT KEMBLA CORDEAUX RD	1133708	E64330768						RUM: 71 Off rd left => obj						No. of TUs involved: 1		Utility pole										
		P	20/02/17	Mon	2000	2 km	E	HARRY GRAHAM DR	2-way	Str	Fine	Dry	60	TRK	W in CORDEAUX RD	Proceeding in lane	48 M	MV driv.	N	NC	0	0	0	0	0	

Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong MOUNT KEMBLA CORDEAUX RD	1224850	E73855948						RUM: 71 Off rd left => obj						No. of TUs involved: 1		Utility pole										
	P	21/02/20	Fri	1515	500 m	W	WILLIAM JAMES DR	2-way	Str	Ovcst	Dry	60	CAR	E in CORDEAUX RD	Proceeding in lane	64 M	MV driv.	K	FC	1	0	0	0	0	S	
	1103271	E61296656						RUM: 71 Off rd left => obj						No. of TUs involved: 1		Roadwork equipment										
	P	18/05/16	Wed	1435	50 m	N	WILLIAM JAMES DR	2-way	Str	Fine	Dry	60	CAR	S in CORDEAUX RD	Proceeding in lane	58 M	MV driv.	M	MC	0	0	1	0	0	0	
South Wollongong KEMBLA HEIGHTS CORDEAUX RD	1204945	E71930063						RUM: 66 Object on road						No. of TUs involved: 1		Other non fixed object										
	P	24/05/19	Fri	1900	0 m	at	HARRY GRAHAM DR	Y-jun	Cur	Fine	Dry	50	M/C	S in HARRY GRAHAM DR	Proceeding in lane	60 M	MC rider	S	SC	0	1	0	0	0	S	
	1120100	E950118090						RUM: 21 Right through						No. of TUs involved: 2												
	P	29/08/16	Mon	1600	0 m	at	DENDROBIUM MINE ENT	2-way	Str	Fine	Dry	50	CAR	W in CORDEAUX RD	Turning right	26 F	MV driv.	M								
													TRK	E in CORDEAUX RD	Proceeding in lane	Unk M	MV driv.	O	MC	0	0	1	1	0	0	
South Wollongong FIGTREE CORDEAUX RD	1196050	E69493645						RUM: 71 Off rd left => obj						No. of TUs involved: 1		Tree/bush										
	P	16/12/18	Sun	0230	300 m	W	CENTRAL RD	2-way	Str	Ovcst	Wet	60	4WD	W in CORDEAUX RD	Proceeding in lane	16 M	MV pass.	M	MC	0	0	2	0	0	F	
	1197800	E272388296						RUM: 73 Off rd right => obj						No. of TUs involved: 1		Fence										
	P	25/03/19	Mon	0715	20 m	W	PRINCES HWY	2-way	Str	Fine	Dry	50	4WD	E in CORDEAUX RD	Proceeding in lane	81 M	MV driv.	S	SC	0	1	0	0	0	F	
	1119561	E62424806						RUM: 30 Rear end						No. of TUs involved: 2												
	P	07/11/16	Mon	0930	20 m	W	AMAROO AVE	2-way	Cur	Fine	Dry	50	WAG	E in CORDEAUX RD	Proceeding in lane	33 M	MV driv.	N	MC	0	0	1	0	0	0	
													CAR	E in CORDEAUX RD	Proceeding in lane	66 M	MV driv.	M								

Detailed Crash Report

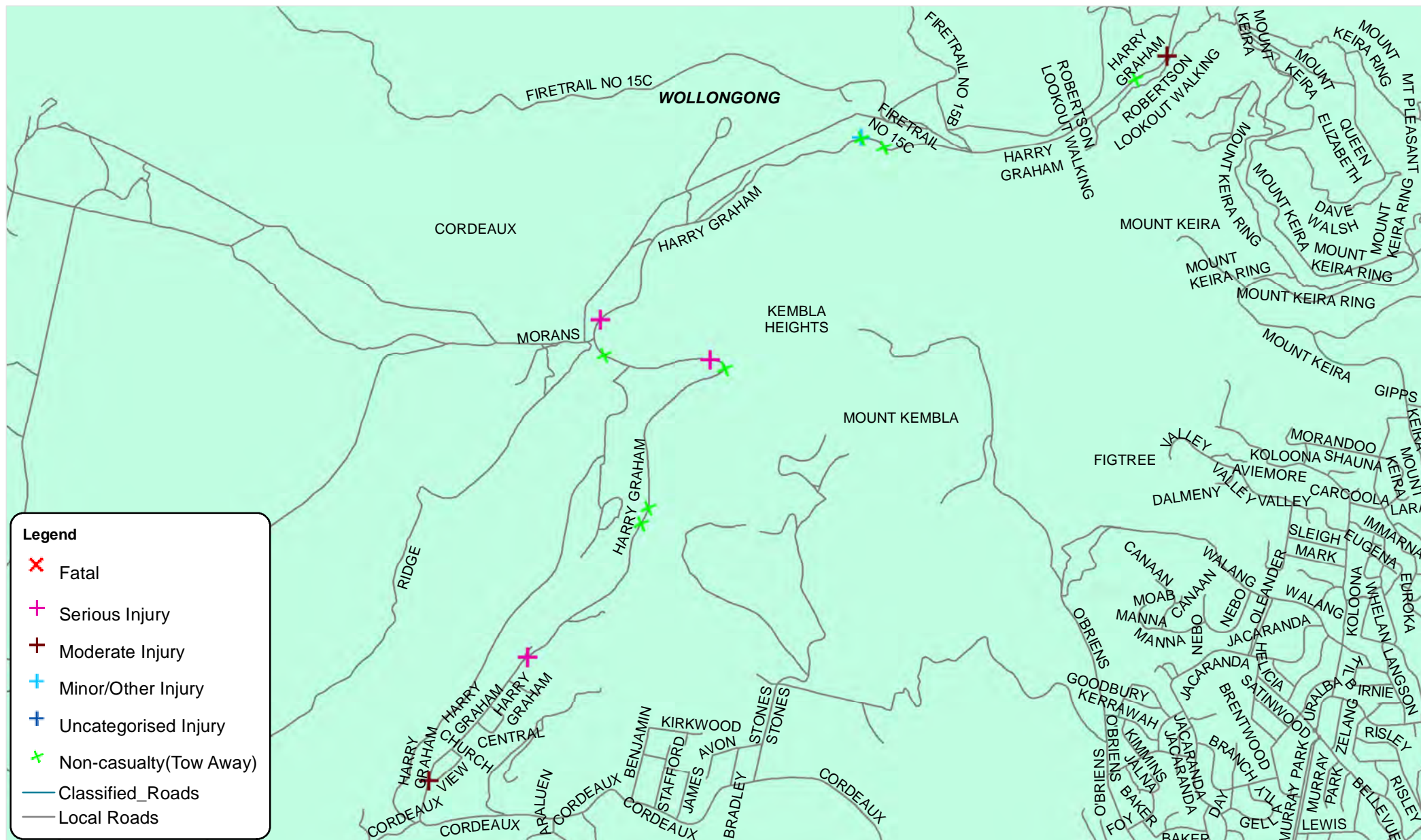
TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong FIGTREE CORDEAUX RD	1213723	E72172859						RUM: 84 Off right/left bend							No. of TUs involved: 1											
	P	17/05/19	Fri	0740	200 m	E	BOOREEA BVD	2-way	Cur	Fine	Dry	60	M/C	E in CORDEAUX RD	Proceeding in lane	35 M	MC rider	S	SC	0	1	0	0	0	S	
South Wollongong FIGTREE CENTRAL RD	1157137	E67076774						RUM: 81 Off left/rt bnd=>obj							No. of TUs involved: 1	Signal pole										
	P	05/12/17	Tue	1228	0 m	at	CORDEAUX RD	T-jun	Str	Fine	Dry	50	CAR	N in CENTRAL RD	Turning right	80 M	MV driv.	S	SC	0	1	0	0	0	0	
	1096155	E60407376						RUM: 13 Right near							No. of TUs involved: 2											
	P	10/02/16	Wed	0530	0 m	at	CORDEAUX RD	T-jun	Str	Fine	Dry	50	CAR	N in CENTRAL RD	Turning right	19 M	MV driv.	M								
													WAG	W in CORDEAUX RD	Proceeding in lane	33 M	MV driv.	M	MC	0	0	2	0	0	S	
Report Totals	Crashes: 18		Fatal Crashes (FC): 1		Serious Injury Crashes (SC): 7		Moderate Injury Crashes (MC): 6		Minor/Other Injury Crashes (OC): 0		Uncategorised Injury															
	Killed (K): 1		Seriously Injured (S): 7		Moderately Injured (M): 8		Minor/Other Injured (O): 1		Uncategorised Injured (U): 0		Not Injured (N): 7															

Report Filters

Dataset Filters

Cordeaux Road

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.

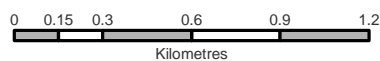


Transport
Roads & Maritime
Services

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Map Produced on 28/07/2021 1:52:45 PM.



Scale at A3 sheet 1:25,571



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Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong CORDEAUX HARRY GRAHAM DR	1172978	E68792363						RUM: 20 Head on							No. of TUs involved: 2											
		S	30/03/18	Fri	2130	2 km	S	MOUNT KEIRA RD	2-way	Cur	Fine	Dry	60	CAR	S in HARRY GRAHAM DR	Incorrect side	20 M	MV driv.	N							
														CAR	N in HARRY GRAHAM DR	Proceeding in lane	31 M	MV driv.	N	NC	0	0	0	0	0	
	1098667	E61224668						RUM: 88 Out of cont on bend							No. of TUs involved: 1											
		P	21/03/16	Mon	0445	1.9 km	S	MOUNT KEIRA RD	2-way	Cur	Fine	Wet	60	CAR	N in HARRY GRAHAM DR	Proceeding in lane	35 M	MV driv.	N	NC	0	0	0	0	0	S
South Wollongong KEMBLA HEIGHTS HARRY GRAHAM DR	1195862	E70335318						RUM: 87 Off lft/lft bnd=>obj							No. of TUs involved: 1	S/Barrier - Guardrail										
		P	17/02/19	Sun	1620	2 km	S	MOUNT KEIRA RD	2-way	Cur	Fine	Dry	50	M/C	S in HARRY GRAHAM DR	Proceeding in lane	Unk M	MC rider	O							
																	Unk F	MC pass.	O	OC	0	0	0	2	0	S
	1174747	E68932441						RUM: 88 Out of cont on bend							No. of TUs involved: 1											
		P	01/07/18	Sun	1550	100 m	N	MORANS RD	2-way	Cur	Fine	Dry	60	M/C	N in HARRY GRAHAM DR	Proceeding in lane	54 M	MC rider	S	SC	0	1	0	0	0	S
South Wollongong KEMBLA HEIGHTS HARRY GRAHAM DR	1152359	E65319405						RUM: 90 Fell in/from vehicle							No. of TUs involved: 1											
		P	23/08/17	Wed	1200	200 m	N	CORDEAUX RD	2-way	Str	Fine	Dry	50	M/C	N in HARRY GRAHAM DR	Proceeding in lane	27 M	MC rider	M	MC	0	0	1	0	0	
	1189837	E69501612						RUM: 81 Off left/rt bnd=>obj							No. of TUs involved: 1	S/Barrier - Guardrail										
		S	28/12/18	Fri	1330	740 m	S	MORANS RD	2-way	Cur	Fine	Dry	100	TRK	S in HARRY GRAHAM DR	Proceeding in lane	42 F	MV driv.	N	NC	0	0	0	0	0	S
	1094681	E60184052						RUM: 66 Object on road							No. of TUs involved: 1	Other non fixed object										
	P	28/02/16	Sun	1330	3 km	N	CORDEAUX RD	2-way	Cur	Fine	Dry	60	M/C	N in HARRY GRAHAM DR	Proceeding in lane	48 F	MC rider	S	SC	0	1	0	0	0	S	
	1226923	E73081209						RUM: 87 Off lft/lft bnd=>obj							No. of TUs involved: 1	S/Barrier - Guardrail										
	S	09/03/20	Mon	0030	100 m	S	MORANS RD	2-way	Cur	Ovcst	Wet	60	CAR	S in HARRY GRAHAM DR	Proceeding in lane	51 F	MV driv.	N	NC	0	0	0	0	0	S	

Detailed Crash Report

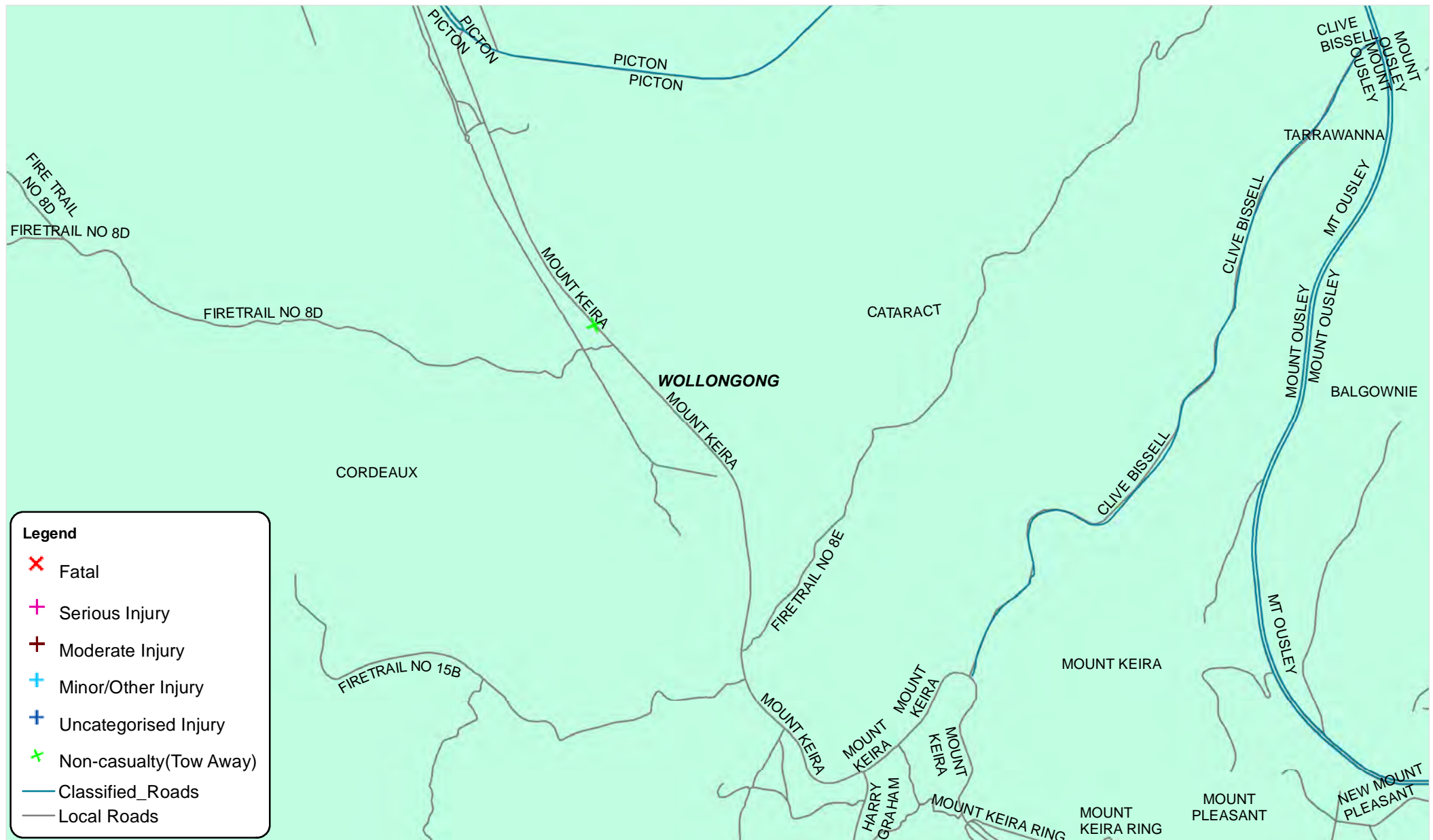
TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong KEMBLA HEIGHTS HARRY GRAHAM DR	1117960	E63109243						RUM: 30 Rear end								No. of TUs involved: 2										
		S	21/10/16	Fri	2200	1 km	S	O'BRIENS ROAD OT	2-way	Str	Ovcst	Wet	60	CAR	N in HARRY GRAHAM DR	Proceeding in lane	45 F	MV driv.	N							
													TRK	N in HARRY GRAHAM DR	Stationary	17 M	MV driv.	N	NC	0	0	0	0	0	0	
	1178163	E68626438						RUM: 88 Out of cont on bend								No. of TUs involved: 1										
		P	05/05/18	Sat	1630	1 km	N	CORDEAUX RD	2-way	Cur	Fine	Dry	50	M/C	S in HARRY GRAHAM DR	Proceeding in lane	38 M	MC rider	S	SC	0	1	0	0	0	S
	1171751	E67837026						RUM: 80 Off left/right bend									No. of TUs involved: 1									
		S	27/05/18	Sun	2100	2 km	N	CORDEAUX RD	2-way	Cur	Fine	Dry	60	CAR	S in HARRY GRAHAM DR	Proceeding in lane	17 F	MV driv.	N	NC	0	0	0	0	0	S
South Wollongong MOUNT KEIRA HARRY GRAHAM DR	1188953	E70359929						RUM: 67 Struck animal								No. of TUs involved: 1	Other large animal									
		S	17/12/18	Mon	0630	500 m	S	MOUNT KEIRA RD	2-way	Str	Fine	Wet	80	TKU	S in HARRY GRAHAM DR	Proceeding in lane	21 M	MV driv.	N	NC	0	0	0	0	0	
	1190352	E69507924						RUM: 84 Off right/left bend								No. of TUs involved: 1										
		P	06/01/19	Sun	1835	300 m	S	MOUNT KEIRA RD	2-way	Cur	Ovcst	Wet	60	CAR	N in HARRY GRAHAM DR	Proceeding in lane	17 M	MV driv.	M	MC	0	0	1	0	0	S F
Report Totals	Crashes: 13		Fatal Crashes (FC): 0		Serious Injury Crashes (SC): 3		Moderate Injury Crashes (MC): 2		Minor/Other Injury Crashes (OC): 1		Uncategorised Injury															
			Killed (K): 0		Seriously Injured (S): 3		Moderately Injured (M): 2		Minor/Other Injured (O): 2		Uncategorised Injured (U): 0		Not Injured (N): 9													

Report Filters

Dataset Filters

Harry Graham Road

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.

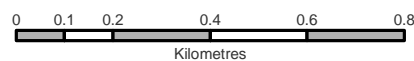


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Detailed Crash Report

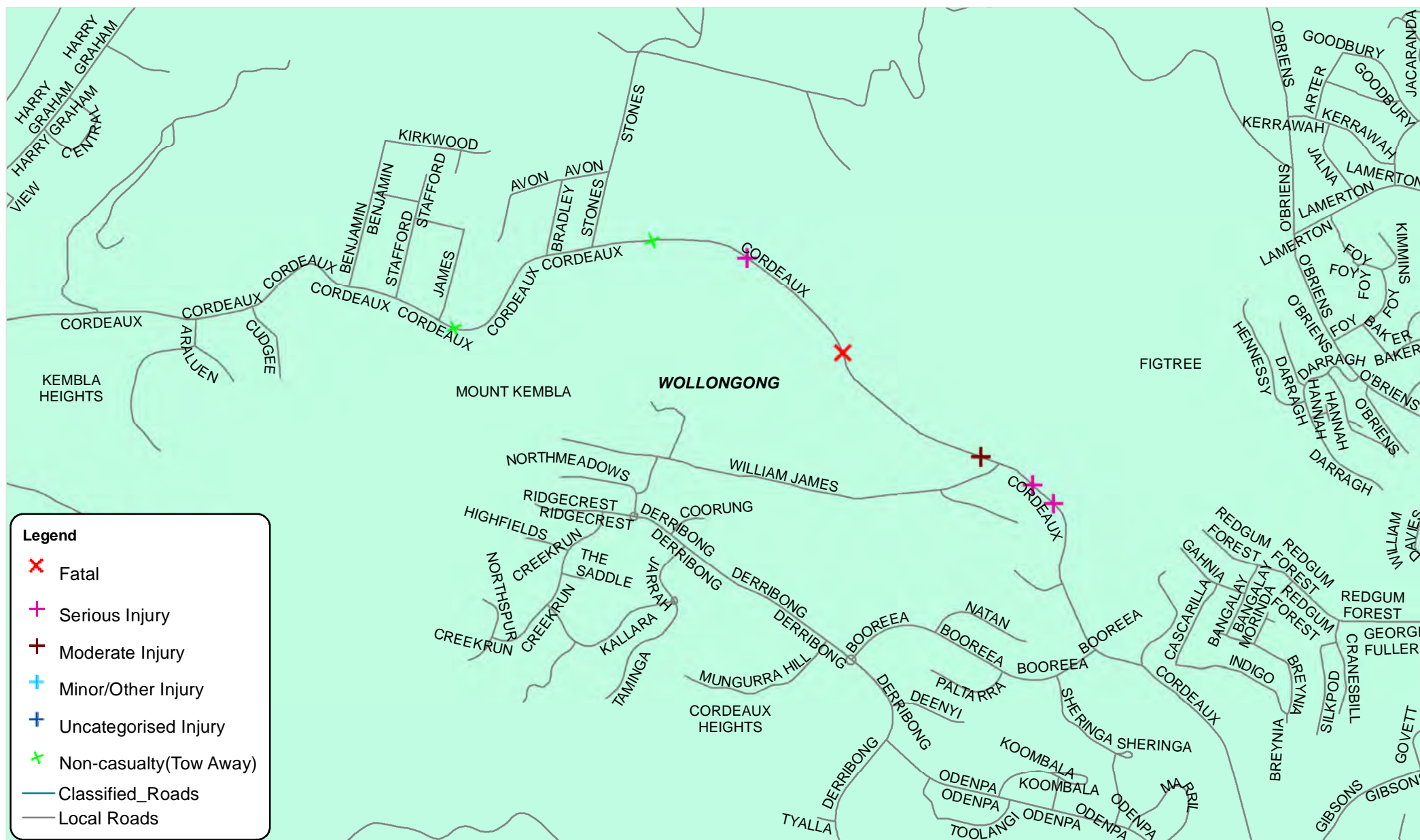
TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
South Wollongong CATARACT MOUNT KEIRA RD	1197676	E71056661	RUM:	20	Head on								No. of TUs involved: 2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Report Filters

Dataset Filters

Mount Keira Road

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.



Legend

- ✕ Fatal
- + Serious Injury
- + Moderate Injury
- + Minor/Other Injury
- + Uncategorised Injury
- + Non-casualty(Tow Away)
- Classified_Roads
- Local Roads

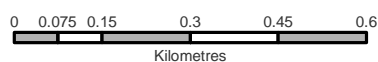


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Detailed Crash Report

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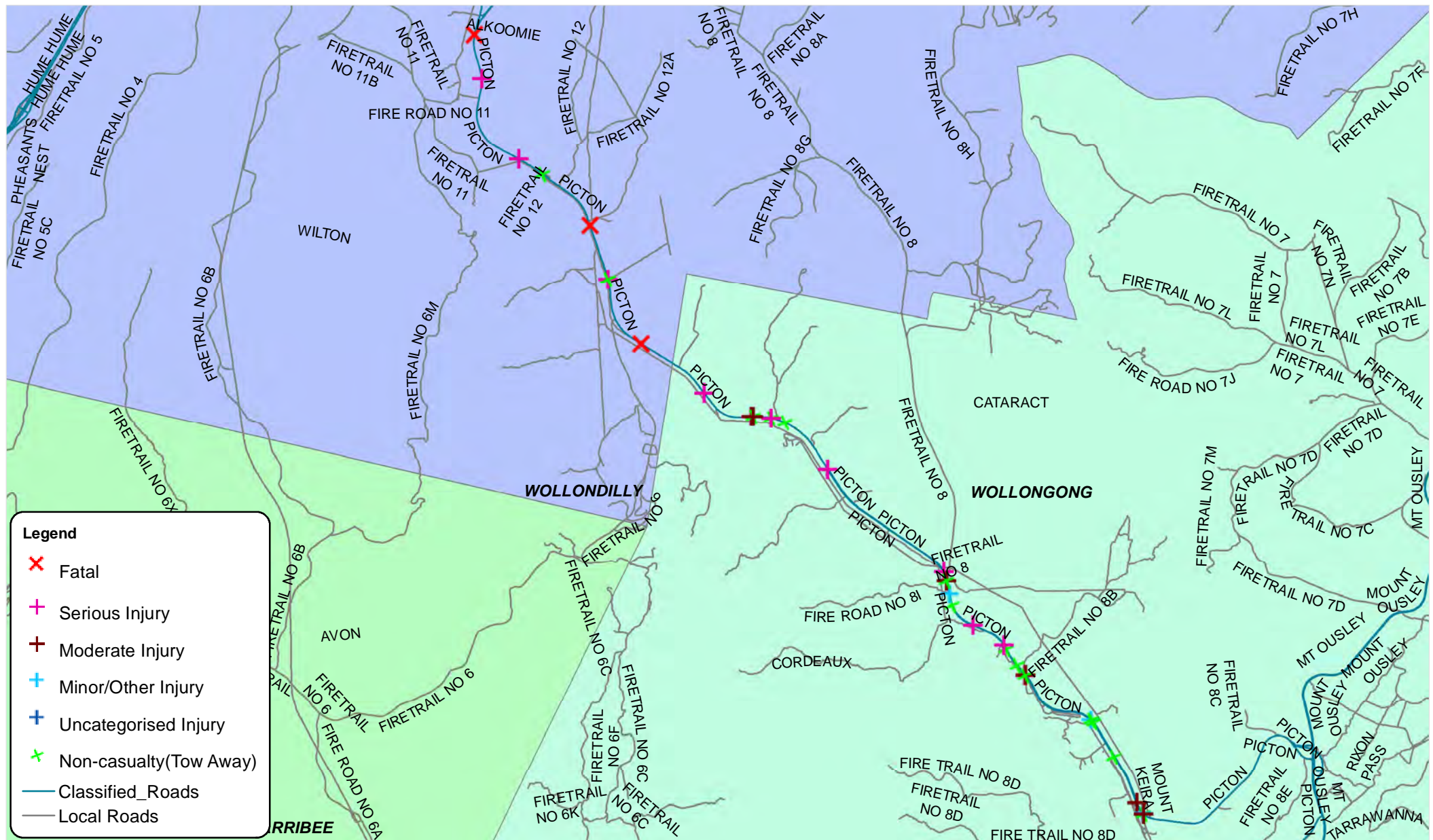
Report Filters

Detailed Crash Report

Dataset Filters

Mount Kembla

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.



Legend

- ✕ Fatal
- ✚ Serious Injury
- ✚ Moderate Injury
- ✚ Minor/Other Injury
- ✚ Uncategorised Injury
- ✚ Non-casualty(Tow Away)
- Classified_Roads
- Local Roads

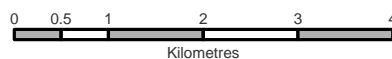


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Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong CATARACT PICTON RD	1124250	E65886888						RUM: 33 Lane sideswipe						No. of TUs involved: 2												
	S	03/01/17	Tue	1830	5 km	W	MOUNT OUSLEY ROAD OP	Div	Cur	Rain	Wet	100	TRK	E in PICTON RD	Proceeding in lane	40 M	MV driv.	N								
													CAR	E in PICTON RD	Proceeding in lane	40 M	MV driv.	N	NC	0	0	0	0	0	0	
	1095711	E301603893						RUM: 13 Right near						No. of TUs involved: 2												
	P	10/03/16	Thu	1550	0 m	at	MOUNT KEIRA RD	T-jun	Cur	Ovcst	Dry	100	CAR	N in MOUNT KEIRA RD	Turning right	76 M	MV driv.	O								
													CAR	W in PICTON RD	Proceeding in lane	39 M	MV driv.	N	OC	0	0	0	1	0	0	
	1098047	E364343492						RUM: 13 Right near						No. of TUs involved: 2												
	P	05/04/16	Tue	1715	0 m	at	MOUNT KEIRA RD	T-jun	Cur	Fine	Dry	80	M/C	N in MOUNT KEIRA RD	Turning right	20 M	MC rider	S								
													CAR	W in PICTON RD	Proceeding in lane	25 M	MV driv.	N	SC	0	1	0	0	0	S	
	1203930	E71349664						RUM: 13 Right near						No. of TUs involved: 2												
	P	12/05/19	Sun	1605	0 m	at	MOUNT KEIRA RD	T-jun	Cur	Fine	Dry	100	CAR	N in MOUNT KEIRA RD	Turning right	17 M	MV driv.	N								
													CAR	W in PICTON RD	Proceeding in lane	54 F	MV driv.	M	MC	0	0	1	0	0	0	
1224796	E73681207							RUM: 86 Off left/left bend					No. of TUs involved: 1													
S	12/02/20	Wed	1830	0 m	at	MOUNT KEIRA RD	T-jun	Cur	Rain	Wet	100	TKU	E in PICTON RD	Proceeding in lane	25 M	MV driv.	N	NC	0	0	0	0	0	0	S	
South Wollongong CORDEAUX PICTON RD	1147838	E67242182						RUM: 30 Rear end					No. of TUs involved: 2													
	S	28/08/17	Mon	2149	5 km	W	MOUNT KEIRA RD	2-way	Cur	Fine	Dry	100	LOR	W in PICTON RD	Proceeding in lane	50 M	MV driv.	N								
													TRK	W in PICTON RD	Proceeding in lane	55 M	MV driv.	N	NC	0	0	0	0	0	0	

Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong CORDEAUX PICTON RD	1139987	E64424236						RUM: 62 Accident								No. of TUs involved: 4										
		P	09/06/17	Fri	2150	150 m	N	NUMBER 8 FIRETRAIL TRL	Div	Cur	Rain	Wet	100	CAR	S in PICTON RD	Proceeding in lane	27 M	MV driv.	M							
														WAG	S in PICTON RD	Broken down	22 M	MV driv.	M	SC	0	1	3	0	0	
														TRK	S in PICTON RD	Parked	23 F	MV pass.	M							
														PED		Stand on carriageway	25 M	Ped.	S							
	1148093	E65332973						RUM: 66 Object on road								No. of TUs involved: 2	Other non fixed object									
		P	08/06/17	Thu	0530	3 km	S	CORDEAUX DAM OT	Div	Cur	Rain	Wet	100	CAR	S in PICTON RD	Proceeding in lane	18 F	MV driv.	S	SC	0	1	0	0	0	
														4WD	S in PICTON RD	Proceeding in lane	36 M	MV driv.	N							
	1186687	E70154908						RUM: 71 Off rd left => obj								No. of TUs involved: 1	S/Barrier - Guardrail									
		P	15/11/18	Thu	0810	9.1 km	N	MOUNT KEIRA RD	Div	Str	Fine	Dry	100	CAR	S in PICTON RD	Incorrect side	32 M	MV driv.	M	MC	0	0	1	0	0	F
	1188678	E69725472						RUM: 71 Off rd left => obj								No. of TUs involved: 1	Tree/bush									
		S	24/11/18	Sat	2200	5 km	W	MOUNT OUSLEY ROAD OP	Div	Str	Fine	Dry	100	CAR	E in PICTON RD	Proceeding in lane	26 M	MV driv.	N	NC	0	0	0	0	0	
	1187517	E69638034						RUM: 71 Off rd left => obj								No. of TUs involved: 1	S/Barrier - Concr/Jersey									
		P	15/11/18	Thu	2115	0 m	at	CORDEAUX COLLIERY OT	Div	Str	Rain	Wet	100	CAR	E in PICTON RD	Proceeding in lane	46 M	MV driv.	S	SC	0	1	0	0	0	F
	1121992	E535750791						RUM: 73 Off rd rght => obj								No. of TUs involved: 1	S/Barrier - Concr/Jersey									
		P	03/09/16	Sat	0055	1.5 km	W	CORDEAUX COLLIERY ENT	Div	Str	Rain	Wet	100	CAR	W in PICTON RD	Proceeding in lane	42 M	MV driv.	M	MC	0	0	1	0	0	F
	1189082	E69510040						RUM: 66 Object on road								No. of TUs involved: 1	Other non fixed object									
		S	15/12/18	Sat	1800	3 km	W	MOUNT KEIRA RD	Div	Cur	Ovcst	Wet	100	WAG	W in PICTON RD	Proceeding in lane	18 M	MV driv.	N	NC	0	0	0	0	0	

Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong CORDEAUX PICTON RD	1093977	E59441970						RUM: 71 Off rd left => obj						No. of TUs involved: 1	S/Barrier - Guardrail											
	P	16/01/16	Sat	1030	3 km	W	MOUNT KEIRA RD	Div	Str	Rain	Wet	90	WAG	W in PICTON RD	Proceeding in lane	30 M	MV driv.	S	SC	0	1	0	0	0		
	1144744	E65332973						RUM: 66 Object on road						No. of TUs involved: 2	Other non fixed object											
	P	08/06/17	Thu	0530	3 km	S	CORDEAUX DAM OT	Div	Cur	Rain	Wet	100	LOR	N in PICTON RD	Proceeding in lane	52 M	MV driv.	N	SC	0	1	0	0	0		
													TRK	N in PICTON RD	Proceeding in lane	26 M	MV driv.	S								
	1181573	E71129186						RUM: 72 Off road to right						No. of TUs involved: 1	Traffic island etc											
	P	22/07/18	Sun	1530	0 m	at	CORDEAUX COLLIERY MINE ENT	Div	Str	Fine	Dry	100	M/C	E in PICTON RD	Pull out opposite	60 M	MC rider	S	SC	0	1	0	0	0	F	
	1148092	E65332973						RUM: 66 Object on road						No. of TUs involved: 1	Other non fixed object											
	P	08/06/17	Thu	0530	3 km	S	CORDEAUX DAM OT	Div	Cur	Rain	Wet	100	4WD	S in PICTON RD	Proceeding in lane	61 M	MV driv.	N	NC	0	0	0	0	0		
	1242872	E74223260						RUM: 69 Other on path						No. of TUs involved: 1	Other non fixed object											
P	09/08/20	Sun	1945	11 km	W	MOUNT KEIRA RD	Div	Str	Rain	Wet	80	WAG	E in PICTON RD	Proceeding in lane	88 M	MV pass.	S	SC	0	2	0	0	0			
																65 M	MV driv.	S								
1223151	E73151623							RUM: 73 Off rd rght => obj						No. of TUs involved: 1	S/Barrier - Concr/Jersey											
P	13/01/20	Mon	2140	40 m	S	FIRE TRAIL NO8 OT	Div	Str	Fine	Dry	100	4WD	S in PICTON RD	Proceeding in lane	37 M	MV driv.	O	OC	0	0	0	1	0	F		
1237672	E75563375							RUM: 85 Off rt/lft bnd=>obj						No. of TUs involved: 1	S/Barrier - Concr/Jersey											
S	28/07/20	Tue	0805	5 km	W	MOUNT OUSLEY ROAD OP	2-way	Cur	Fine	Wet	100	CAR	W in PICTON RD	Proceeding in lane	32 M	MV driv.	O	OC	0	0	0	1	0	S		
1148065	E64917211							RUM: 73 Off rd rght => obj						No. of TUs involved: 1	S/Barrier - Concr/Jersey											
P	17/08/17	Thu	1107	3.2 km	W	MOUNT KEIRA RD	Div	Str	Fine	Dry	100	TRK	W in PICTON RD	Proceeding in lane	52 M	MV driv.	N	NC	0	0	0	0	0			

Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong CORDEAUX PICTON RD	1116217	E535750791						RUM: 73 Off rd rght => obj								No. of TUs involved: 1	S/Barrier - Concr/Jersey									
	P	03/09/16	Sat	0045	1.5 km	W	CORDEAUX COLLIERY ENT	Div	Str	Rain	Wet	100	SEM	E in PICTON RD	Proceeding in lane	34 M	MV driv.	N	NC	0	0	0	0	0		
	1083882	E58143510						RUM: 71 Off rd left => obj								No. of TUs involved: 1	S/Barrier - Guardrail									
	S	04/11/15	Wed	1010	1 km	N	MOUNT KEIRA RD	Div	Str	Rain	Wet	100	TRK	N in PICTON RD	Proceeding in lane	27 M	MV driv.	N	NC	0	0	0	0	0		
	1192603	E67789510						RUM: 87 Off lft/lft bnd=>obj								No. of TUs involved: 1	Embankment									
	S	07/11/18	Wed	1930	7 km	W	MOUNT OUSLEY ROAD OP	Div	Cur	Rain	Wet	100	TKU	W in PICTON RD	Proceeding in lane	54 M	MV driv.	S	SC	0	1	0	0	0	S	
	1129015	E384383892						RUM: 85 Off rt/lft bnd=>obj								No. of TUs involved: 1	S/Barrier - Concr/Jersey									
	S	26/02/17	Sun	0325	200 m	S	FIRE ROAD NO 8 MS	Div	Cur	Rain	Wet	100	UTE	S in PICTON RD	Proceeding in lane	53 M	MV driv.	N	NC	0	0	0	0	0	S	
	1115300	E63037974						RUM: 87 Off lft/lft bnd=>obj								No. of TUs involved: 1	S/Barrier - Guardrail									
S	09/09/16	Fri	1430	5 km	W	MOUNT KEIRA RD	Div	Cur	Fine	Dry	100	4WD	W in PICTON RD	Proceeding in lane	36 M	MV driv.	M	MC	0	0	1	0	0	S		
1085303	E59654948							RUM: 81 Off left/rt bnd=>obj								No. of TUs involved: 1	S/Barrier - Concr/Jersey									
P	12/11/15	Thu	1500	3 km	W	MOUNT KEIRA RD	Div	Cur	Rain	Wet	100	CAR	E in PICTON RD	Proceeding in lane	41 M	MV driv.	M	MC	0	0	1	0	0	S		
1121399	E62325811							RUM: 71 Off rd left => obj								No. of TUs involved: 1	Tree/bush									
P	15/10/16	Sat	1230	10 km	N	MOUNT KEIRA RD	2-way	Str	Fine	Dry	100	CAR	N in PICTON RD	Proceeding in lane	20 M	MV driv.	S	SC	0	1	0	0	0	F		
1198189	E71590639							RUM: 71 Off rd left => obj								No. of TUs involved: 1	Tree/bush									
P	16/03/19	Sat	0730	200 m	N	MOUNT KEIRA RD	Div	Str	Fine	Dry	70	CAR	S in PICTON RD	Proceeding in lane	20 F	MV driv.	M	MC	0	0	1	0	0	F		
1206280	E72989355							RUM: 85 Off rt/lft bnd=>obj								No. of TUs involved: 1	S/Barrier - Concr/Jersey									
S	04/06/19	Tue	0645	3 km	W	MOUNT KEIRA RD	Div	Cur	Rain	Wet	100	CAR	W in PICTON RD	Proceeding in lane	38 M	MV driv.	M	MC	0	0	1	0	0	S		

Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
South Wollongong CORDEAUX PICTON RD	1126235	E537237291	RUM: 20 Head on																							
	P	21/09/16	Wed	1630	9.5 km	W	MOUNT KEIRA RD	2-way	Str	Rain	Wet	100	CAR	W in PICTON RD	Incorrect side	26 F	MV pass.	S								
															38 M	MV driv.	S									
													CAR	E in PICTON RD	Proceeding in lane	27 M	MV driv.	N	SC	0	2	1	0	0		
													CAR	E in PICTON RD	Proceeding in lane	18 M	MV driv.	M								
	1098433	E60542005	RUM: 20 Head on																							
	S	06/04/16	Wed	0610	1 km	W	CORDEAUX COLLIERY ENT	2-way	Cur	Fine	Dry	100	TRK	E in PICTON RD	Incorrect side	37 M	MV driv.	N								
													WAG	W in PICTON RD	Proceeding in lane	25 F	MV driv.	N	NC	0	0	0	0	0	0	
	1131222	E63832117	RUM: 30 Rear end																							
	S	22/03/17	Wed	1630	3 km	N	MOUNT KEIRA RD	2-way	Str	Rain	Wet	100	4WD	N in PICTON RD	Proceeding in lane	23 F	MV driv.	M								
LOR													N in PICTON RD	Proceeding in lane	57 M	MV driv.	N	MC	0	0	1	0	0			
1145137	E67330316	RUM: 30 Rear end																								
S	21/06/17	Wed	0800	3.5 km	E	MOUNT KEIRA RD	Div	Str	Fine	Dry	100	UTE	E in PICTON RD	Proceeding in lane	18 M	MV driv.	N									
												CAR	E in PICTON RD	Proceeding in lane	33 M	MV driv.	N	NC	0	0	0	0	0			
												TRK	E in PICTON RD	Stationary	37 M	MV driv.	N									
Greater Sydney Wollondilly WILTON PICTON RD	1241098	E323312995	RUM: 85 Off rt/lft bnd=>obj													S/Barrier - Concr/Jersey										
	P	15/07/20	Wed	1700	1 km	S	MACARTHUR RD	2-way	Cur	Ovcst	Dry	100	CAR	N in PICTON RD	Proceeding in lane	24 F	MV driv.	S	SC	0	1	0	0	0	S	
	1230487	E73169903	RUM: 73 Off rd right => obj													S/Barrier - Guardrail										
	P	31/12/19	Tue	1810	8.8 km	E	HUME HWY	Div	Str	Fine	Dry	100	TRK	W in PICTON RD	Proceeding in lane	47 M	MV driv.	S	SC	0	1	0	0	0		

Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor
Greater Sydney Wollondilly WILTON PICTON RD	1185697	P	14/11/18	Wed	0335	300 m	S	MACARTHUR DR	2-way	Cur	Ovcst	Dry	100	TRK	N in PICTON RD	Incorrect side	39 M	MV driv.	K	FC	1	1	0	0	0	
														SEM	S in PICTON RD	Proceeding in lane	38 M	MV driv.	S							
Greater Sydney Wollondilly CATARACT PICTON RD	1091878	P	07/02/16	Sun	1440	10 km	E	HUME HWY	2-way	Str	Fine	Dry	100	TRK	W in PICTON RD	Pull out opposite	47 M	MV driv.	M	FC	1	1	1	1	0	0
														4WD	E in PICTON RD	Proceeding in lane	45 F	MV driv.	S							
														4WD	W in PICTON RD	Proceeding in lane	74 M	MV pass.	O							
	1096723	P	18/01/16	Mon	0730	5 km	S	MACARTHUR DR	2-way	Str	Fine	Dry	100							SC	0	1	0	1	0	0
														TRK	N in PICTON RD	Proceeding in lane	Unk U	MV pass.	O							
														4WD	N in PICTON RD	Proceeding in lane	43 F	MV driv.	N							
	1231789	P	13/01/20	Mon	0304	5 km	E	MACARTHUR DR	Div	Str	Rain	Wet	100	TKU	E in PICTON RD	Proceeding in lane	25 M	MV driv.	S	SC	0	1	0	0	0	F
1181838	E69269176	P	29/09/18	Sat	1315	550 m	E	CORDEAUX DAM RD	2-way	Str	Fine	Dry	100	CAR	W in PICTON RD	Proceeding in lane	25 F	MV driv.	K	FC	1	0	0	0	0	F
1171836	E70783667	S	25/05/18	Fri	2340	5 km	S	MACARTHUR RD	2-way	Str	Fine	Dry	100	4WD	N in PICTON RD	Proceeding in lane	49 M	MV driv.	N	NC	0	0	0	0	0	0
														BOX	N in PICTON RD	Parked										

Detailed Crash Report

TNSW Region / LGA / Town / Street	Crash ID	Data Source	Date of crash	Day of Week	Time	Distance	Direction	ID Feature	Location type	Alignment	Weather	Surface condition	Speed limit	TU Type	TU Direction	TU Manoeuvre	Age / Gender	Road User Class	Degree of casualty	Degree of crash	Killed	Serious Injury	Moderate Injury	Minor Other Injury	Uncategorised Injury	Crash Factor	
Greater Sydney Wollondilly CATARACT PICTON RD	1150585	E66144615						RUM: 30	Rear end							No. of TUs involved: 2											
		S	01/10/17	Sun	0430	5 km	S	MACARTHUR RD	2-way	Str	Fine	Dry	100	VAN	N in PICTON RD	Proceeding in lane	47 F	MV driv.	N								
														CAR	N in PICTON RD	Proceeding in lane	74 M	MV driv.	N	NC	0	0	0	0	0		
	1165196	E67497864						RUM: 30	Rear end							No. of TUs involved: 2											
		S	16/03/18	Fri	0510	3 km	S	MACARTHUR RD	2-way	Cur	Fine	Dry	100	CAR	N in PICTON RD	Proceeding in lane	33 M	MV driv.	N								
															TKU	N in PICTON RD	Proceeding in lane	22 M	MV driv.	N	NC	0	0	0	0	0	
Report Totals	Crashes: 44		Fatal Crashes (FC): 3			Serious Injury Crashes (SC): 15 Crashes (UC): 0			Moderate Injury Crashes (MC): 8 Non-Casualty Crashes (NC): 15			Minor/Other Injury Crashes (OC): 3			Uncategorised Injury												
	Killed (K): 3			Seriously Injured (S): 19			Moderately Injured (M): 13			Minor/Other Injured (O): 5			Uncategorised Injured (U): 0			Not Injured (N): 30											

Report Filters

Dataset Filters

Picton Road

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.

Cordeaux Road Crash History (1 October 2015 to 30 September 2020)

	Pedestrian	Adjacent Approaches	Opposing Directions	Same Direction	U-turn/Parking	Overtaking	On Path	Off Path on Straight	Off Path on Curve	Miscellaneous	Total
Total Crashes	-	1	2	2	-	-	2	7	4	-	18
Crash Location											
2-way undivided road	-	-	1	1	-	-	1	6	3	-	12
T-intersection	-	1	-	-	-	-	-	-	1	-	2
Roundabout		-	1	1	-	-	-	1	-	-	3
Y-intersection		-	-	-	-	-	1	0	-	-	1
Road Surface Condition											
Dry	-	1	2	2	-	-	2	6	4	-	17
Wet	-	-	-	-	-	-	-	-	1	-	1
Weather											
Fine	-	1	2	2	-	-	2	5	4	-	16
Overcast	-	-	-	-	-	-	-	2	-	-	2
Natural Lighting											
Dawn	-	1	-	-	-	-	1	-	-	-	2
Daylight	-	-	2	2	-	-	-	5	3	-	12
Dusk	-	-	-	-	-	-	1	-	-	-	1
Darkness	-	-	-	-	-	-	-	2	1	-	3
Severity of Crash											
Fatal	-	-	-	-	-	-	-	1	-	-	1
Injury	-	1	1	1	-	-	2	5	3	-	13
Non-casualty (towaway)	-	-	1	1	-	-	-	1	1	-	4
Speed Limit											
50 km/h	-	1	1	1	-	-	1	1	1	-	6
60 km/h	-	-	1	1	-	-	1	6	3	-	12
Vehicle Types Involved											
Pedal cycle	-	-	-	-	-	-	1	-	-	-	1
Motorcycle	-	-	-	-	-	-	1	-	1	-	2
Car, 4WD, station wagon, utility	-	2	4	4	-	-	-	7	3	-	20
Contributing Factors											
Speeding	-	-	-	-	-	-	-	2	-	-	2
Fatigue	-	1	1	-	-	-	1	1	3	-	7
None	-	-	1	2	-	-	1	4	1	-	9

Harry Graham Drive/Mount Keira Road Crash History (1 October 2015 to 30 September 2020)

	Pedestrian	Adjacent Approaches	Opposing Directions	Same Direction	U-turn/Parking	Overtaking	On Path	Off Path on Straight	Off Path on Curve	Miscellaneous	Total
Total Crashes	-	-	2	1	-	-	2	-	8	1	14
Crash Location											
2-way undivided road	-	-	2	1	-	-	2	-	8	1	14
Road Surface Condition											
Dry	-	-	2	-	-	-	1	-	5	1	9
Wet	-	-	-	1	-	-	1	-	3	-	5
Weather											
Fine	-	-	2	-	-	-	2	-	6	1	7
Overcast	-	-	-	1	-	-	-	-	2	-	6
Natural Lighting											
Daylight	-	-	-	-	-	-	2	-	4	1	7
Dusk	-	-	-	-	-	-	-	-	1	-	1
Darkness	-	-	2	1	-	-	-	-	3	-	6
Severity of Crash											
Injury	-	-	-	-	-	-	1	-	4	1	6
Non-casualty (towaway)	-	-	2	1	-	-	1	-	4	-	8
Speed Limit											
50 km/h	-	-	-	-	-	-	-	-	2	1	3
60 km/h	-	-	1	1	-	-	1	-	5	-	8
80 km/h	-	-	1	-	-	-	1	-	-	-	2
100 km/h	-	-	-	-	-	-	-	-	1	-	1
Vehicle Types Involved											
Motorcycle	-	-	-	-	-	-	1	-	3	1	5
Car, 4WD, station wagon, utility	-	-	4	2	-	-	1	-	5	-	12
Contributing Factors											
Speeding (only)	-	-	-	-	-	-	1	-	7	-	8
Speeding and Fatigue	-	-	-	-	-	-	-	-	1	-	1
None	-	-	2	1	-	-	1	-	0	1	5

Picton Road Crash History (1 October 2015 to 30 September 2020)

	Pedestrian	Adjacent Approaches	Opposing Directions	Same Direction	U-turn/Parking	Overtaking	On Path	Off Path on Straight	Off Path on Curve	Miscellaneous	Total
Total Crashes	-	3	3	7	-	1	6	16	8	-	44
Crash Location											
2-way undivided road	-	-	3	5	-	1	-	3	2	-	14
T-intersection	-	-	-	2	-	-	6	13	5	-	26
Roundabout	-	3	-	-	-	-	-	-	1	-	4
Y-intersection	-	-	3	5	-	1	-	3	2	-	14
Road Surface Condition											
Dry	-	3	2	5	-	1	-	10	2	-	23
Wet	-	-	1	2	-	-	6	6	6	-	21
Weather											
Fine	-	2	1	5	-	1	-	10	2	-	21
Overcast	-	1	1	-	-	-	1	-	1	-	4
Raining	-	-	1	2	-	-	5	6	5	-	19
Natural Lighting											
Dawn	-	-	1	1	-	-	-	-	-	-	2
Daylight	-	3	1	3	-	1	1	9	6	-	24
Dusk	-	-	-	1	-	-	-	-	-	-	1
Darkness	-	-	1	2	-	-	5	7	2	-	17
Severity of Crash											
Fatal	-	-	1	-	-	1	-	1	-	-	3
Injury	-	3	1	2	-	-	4	10	6	-	26
Non-casualty (towaway)	-	-	1	5	-	-	2	5	2	-	15
Speed Limit											
70 to 80 km/h	-	1	-	-	-	-	1	1	-	-	3
90 km/h	-	-	-	-	-	-	-	1	-	-	1
100 km/h	-	2	3	7	-	1	5	14	8	-	40
Vehicle Types Involved											
Motorcycle	-	1	-	-	-	-	-	1	-	-	2
Car, 4WD, station wagon, utility	-	5	5	11	-	2	6	14	8	-	51
Rigid Truck	-	-	-	2	-	-	1	-	-	-	3
Articulated Vehicle	-	-	1	-	-	-	-	1	-	-	2
Other	-	-	-	1	-	-	-	1	-	-	2

	Pedestrian	Adjacent Approaches	Opposing Directions	Same Direction	U-turn/Parking	Overtaking	On Path	Off Path on Straight	Off Path on Curve	Miscellaneous	Total
Contributing Factors											
Speeding	-	1	-	-	-	-	-	-	8	-	9
Fatigue	-	-	-	-	-	-	-	9	-	-	9
None	-	2	3	7	-	1	6	7	-	-	26
Year of Crash											
2015 (Oct to Dec)	-	-	-	-	-	-	-	1	1	-	2
2016	-	2	2	1	-	1	-	4	1	-	11
2017	-	-	-	5	-	-	4	1	1	-	11
2018	-	-	1	1	-	-	1	6	1	-	10
2019	-	1	-	-	-	-	-	1	1	-	3
2020 (Jan to Sep)	-	-	-	-	-	-	1	3	3	-	7

Appendix C

SIDRA Outputs

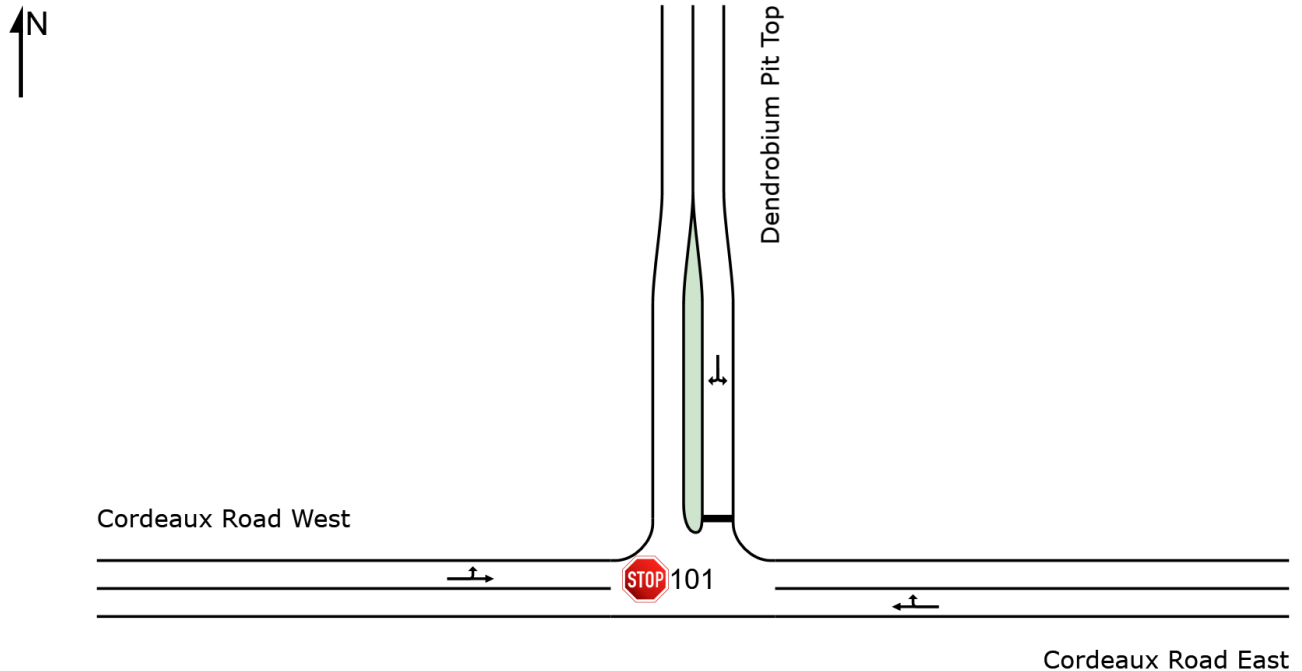
SIDRA data files will be supplied upon request.

SITE LAYOUT

 **Site: 101 [Dendrobium AM 2021 (Site Folder: Dendrobium Pit Top 2021)]**

Dendrobium Pit Top Access
2021 AM Peak
4.45am-4.45am
Site Category: (None)
Stop (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

 **Site: 101 [Dendrobium AM 2021 (Site Folder: Dendrobium Pit Top 2021)]**

Dendrobium Pit Top Access
2021 AM Peak
4.45am-4.45am
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	[HV] veh/h	[Total veh/h	[HV] %				[Veh. veh	[Dist] m				
East: Cordeaux Road East														
5	T1	4	0	4	0.0	0.084	0.0	LOS A	0.4	2.8	0.05	0.57	0.05	55.0
6	R2	138	0	145	0.0	0.084	5.5	LOS A	0.4	2.8	0.05	0.57	0.05	29.2
Approach		142	0	149	0.0	0.084	5.3	NA	0.4	2.8	0.05	0.57	0.05	29.6
North: Dendrobium Pit Top														
7	L2	3	0	3	0.0	0.003	4.1	LOS A	0.0	0.1	0.02	0.98	0.02	28.4
9	R2	1	0	1	0.0	0.003	4.7	LOS A	0.0	0.1	0.02	0.98	0.02	28.3
Approach		4	0	4	0.0	0.003	4.2	LOS A	0.0	0.1	0.02	0.98	0.02	28.4
West: Cordeaux Road West														
10	L2	2	0	2	0.0	0.004	5.6	LOS A	0.0	0.0	0.00	0.17	0.00	56.7
11	T1	5	1	5	20.0	0.004	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	58.2
Approach		7	1	7	14.3	0.004	1.6	NA	0.0	0.0	0.00	0.17	0.00	57.8
All Vehicles		153	1	161	0.7	0.084	5.1	NA	0.4	2.8	0.04	0.56	0.04	30.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 101 [Dendrobium PM 2021 (Site Folder: Dendrobium Pit Top 2021)]**

Dendrobium Pit Top Access
2021 PM Peak
3.45pm-4.45am
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] veh/h	[Total veh/h]	[HV] %				[Veh. veh]	[Dist] m				
East: Cordeaux Road East														
5	T1	26	2	27	7.7	0.016	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.7
6	R2	1	0	1	0.0	0.016	5.6	LOS A	0.0	0.0	0.01	0.02	0.01	30.5
Approach		27	2	28	7.4	0.016	0.2	NA	0.0	0.0	0.01	0.02	0.01	57.7
North: Dendrobium Pit Top														
7	L2	124	1	131	0.8	0.097	4.2	LOS A	0.4	2.9	0.13	0.92	0.13	28.4
9	R2	2	0	2	0.0	0.097	4.4	LOS A	0.4	2.9	0.13	0.92	0.13	28.3
Approach		126	1	133	0.8	0.097	4.2	LOS A	0.4	2.9	0.13	0.92	0.13	28.4
West: Cordeaux Road West														
10	L2	1	0	1	0.0	0.023	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.2
11	T1	40	1	42	2.5	0.023	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		41	1	43	2.4	0.023	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		194	4	204	2.1	0.097	2.8	NA	0.4	2.9	0.08	0.60	0.08	34.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 101 [Dendrobium AM 2023 (Site Folder: Dendrobium Pit Top 2023)]**

Dendrobium Pit Top Access
2023 AM Peak with Project
4.45am-4.45am
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Cordeaux Road East														
5	T1	5	0	5	0.0	0.097	0.0	LOS A	0.5	3.3	0.06	0.56	0.06	55.0
6	R2	160	0	168	0.0	0.097	5.5	LOS A	0.5	3.3	0.06	0.56	0.06	29.2
Approach		165	0	174	0.0	0.097	5.3	NA	0.5	3.3	0.06	0.56	0.06	29.7
North: Dendrobium Pit Top														
7	L2	3	0	3	0.0	0.003	4.1	LOS A	0.0	0.1	0.03	0.98	0.03	28.4
9	R2	1	0	1	0.0	0.003	4.9	LOS A	0.0	0.1	0.03	0.98	0.03	28.3
Approach		4	0	4	0.0	0.003	4.3	LOS A	0.0	0.1	0.03	0.98	0.03	28.4
West: Cordeaux Road West														
10	L2	3	0	3	0.0	0.006	5.6	LOS A	0.0	0.0	0.00	0.18	0.00	56.5
11	T1	7	2	7	28.6	0.006	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	58.0
Approach		10	2	11	20.0	0.006	1.7	NA	0.0	0.0	0.00	0.18	0.00	57.5
All Vehicles		179	2	188	1.1	0.097	5.1	NA	0.5	3.3	0.06	0.55	0.06	30.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 101 [Dendrobium PM 2023 (Site Folder: Dendrobium Pit Top 2023)]**

Dendrobium Pit Top Access
2023 PM Peak with Project
3.45pm-4.45am
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Cordeaux Road East														
5	T1	28	3	29	10.7	0.017	0.0	LOSA	0.0	0.0	0.01	0.02	0.01	59.8
6	R2	1	0	1	0.0	0.017	5.6	LOSA	0.0	0.0	0.01	0.02	0.01	30.5
Approach		29	3	31	10.3	0.017	0.2	NA	0.0	0.0	0.01	0.02	0.01	57.8
North: Dendrobium Pit Top														
7	L2	149	3	157	2.0	0.118	4.3	LOSA	0.5	3.6	0.14	0.92	0.14	28.4
9	R2	3	0	3	0.0	0.118	4.5	LOSA	0.5	3.6	0.14	0.92	0.14	28.3
Approach		152	3	160	2.0	0.118	4.3	LOSA	0.5	3.6	0.14	0.92	0.14	28.4
West: Cordeaux Road West														
10	L2	1	0	1	0.0	0.024	5.6	LOSA	0.0	0.0	0.00	0.01	0.00	58.2
11	T1	42	2	44	4.8	0.024	0.0	LOSA	0.0	0.0	0.00	0.01	0.00	59.9
Approach		43	2	45	4.7	0.024	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		224	8	236	3.6	0.118	3.0	NA	0.5	3.6	0.09	0.63	0.09	34.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 101 [Dendrobium AM 2037 (Site Folder: Dendrobium Pit Top 2037)]**

Dendrobium Pit Top Access
2037 AM Peak with Project
4.45am-4.45am
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Cordeaux Road East														
5	T1	5	0	5	0.0	0.093	0.0	LOS A	0.5	3.2	0.06	0.56	0.06	55.0
6	R2	153	0	161	0.0	0.093	5.5	LOS A	0.5	3.2	0.06	0.56	0.06	29.2
Approach		158	0	166	0.0	0.093	5.3	NA	0.5	3.2	0.06	0.56	0.06	29.7
North: Dendrobium Pit Top														
7	L2	3	0	3	0.0	0.003	4.1	LOS A	0.0	0.1	0.03	0.97	0.03	28.4
9	R2	1	0	1	0.0	0.003	4.8	LOS A	0.0	0.1	0.03	0.97	0.03	28.3
Approach		4	0	4	0.0	0.003	4.3	LOS A	0.0	0.1	0.03	0.97	0.03	28.4
West: Cordeaux Road West														
10	L2	3	0	3	0.0	0.006	5.6	LOS A	0.0	0.0	0.00	0.18	0.00	56.5
11	T1	7	2	7	28.6	0.006	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	58.0
Approach		10	2	11	20.0	0.006	1.7	NA	0.0	0.0	0.00	0.18	0.00	57.5
All Vehicles		172	2	181	1.2	0.093	5.1	NA	0.5	3.2	0.05	0.55	0.05	30.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 101 [Dendrobium PM 2037 (Site Folder: Dendrobium Pit Top 2037)]**

Dendrobium Pit Top Access
2037 PM Peak with Project
3.45pm-4.45am
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Cordeaux Road East														
5	T1	32	3	34	9.4	0.019	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.8
6	R2	1	0	1	0.0	0.019	5.6	LOS A	0.0	0.0	0.01	0.02	0.01	30.5
Approach		33	3	35	9.1	0.019	0.2	NA	0.0	0.0	0.01	0.02	0.01	58.1
North: Dendrobium Pit Top														
7	L2	139	2	146	1.4	0.110	4.3	LOS A	0.5	3.3	0.15	0.91	0.15	28.4
9	R2	3	0	3	0.0	0.110	4.5	LOS A	0.5	3.3	0.15	0.91	0.15	28.3
Approach		142	2	149	1.4	0.110	4.3	LOS A	0.5	3.3	0.15	0.91	0.15	28.4
West: Cordeaux Road West														
10	L2	1	0	1	0.0	0.028	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.2
11	T1	48	2	51	4.2	0.028	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		49	2	52	4.1	0.028	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		224	7	236	3.1	0.110	2.8	NA	0.5	3.3	0.09	0.58	0.09	35.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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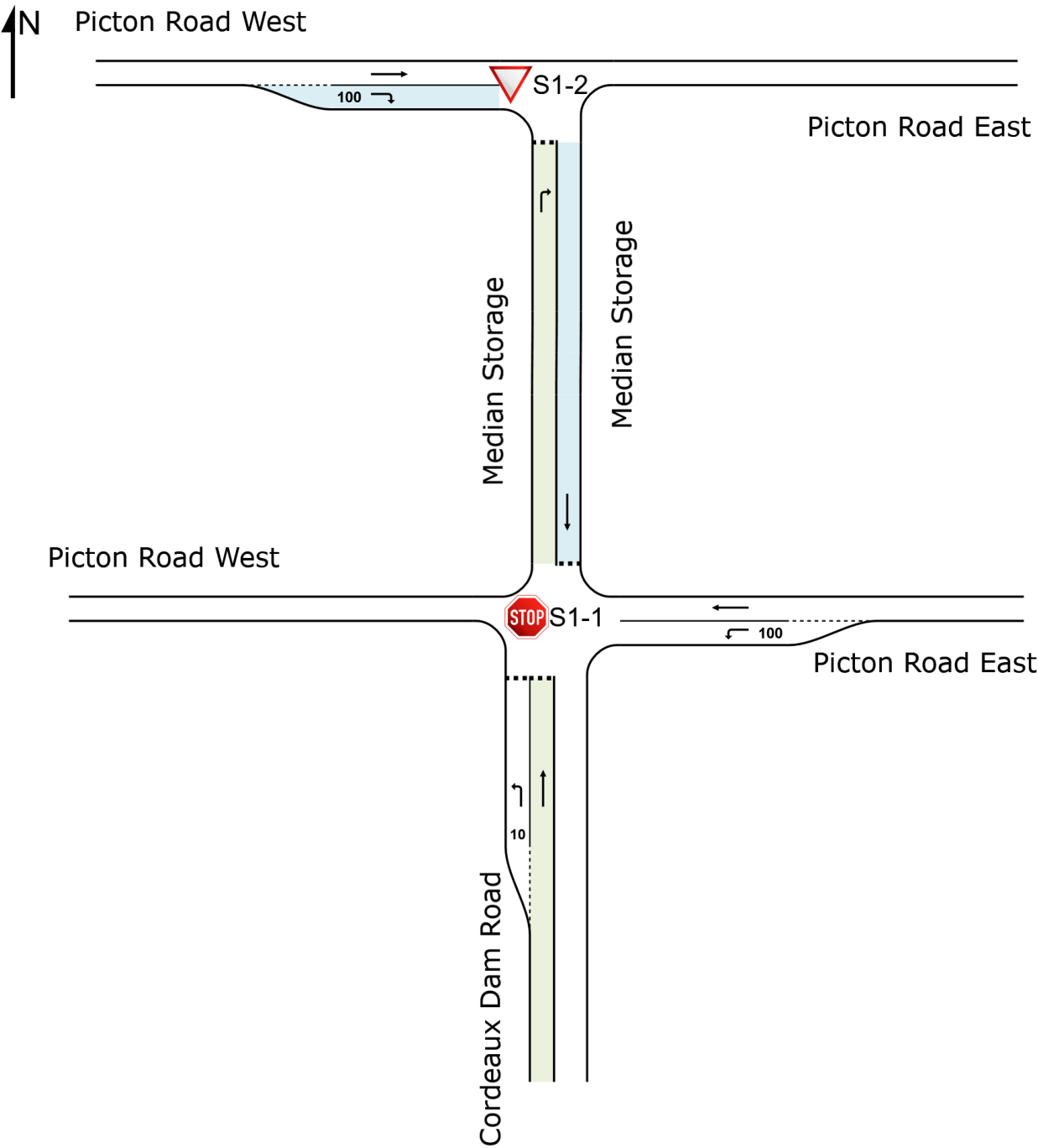
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NETWORK LAYOUT

■ ■ Network: SCTI-B [Staged Crossing B-1 - AM No Project
(Network Folder: Cordeaux Dam Road 2023)]

Staged Crossing at T Intersection Type B
Network Category: (None)


Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	CCG ID	Site Name
▽ S1-2	NA	S1-2 NSW - AM No Project
STOP S1-1	NA	S1-1 NSW - AM No Project

MOVEMENT SUMMARY

 **Site: S1-1 [S1-1 NSW - AM No Project (Site Folder: Cordeaux Dam Road 2023)]**

 **Network: SCTI-B [Staged Crossing B-1 - AM No Project (Network Folder: Cordeaux Dam Road 2023)]**

Staged Crossing at T Intersection Type B
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Cordeaux Dam Road														
1	L2	1	0.0	1	0.0	0.002	9.7	LOS A	0.0	0.0	0.62	0.64	0.62	58.2
2	T1	1	0.0	1	0.0	0.003	9.6	LOS A	0.0	0.0	0.74	0.57	0.74	18.1
Approach		2	0.0	2	0.0	0.003	9.6	LOS A	0.0	0.0	0.68	0.61	0.68	33.5
East: Picton Road East														
3	L2	1	0.0	1	0.0	0.001	7.8	LOS A	0.0	0.0	0.00	0.66	0.00	75.3
4	T1	720	30.3	720	30.3	0.442	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.6
Approach		721	30.2	721	30.2	0.442	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.6
North: Median Storage														
5	T1	1	0.0	1	0.0	0.002	4.1	LOS A	0.0	0.0	0.61	0.43	0.61	47.4
Approach		1	0.0	1	0.0	0.002	4.1	LOS A	0.0	0.0	0.61	0.43	0.61	47.4
All Vehicles		724	30.1	724	30.1	0.442	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▼ Site: S1-2 [S1-2 NSW - AM No Project (Site Folder: Cordeaux Dam Road 2023)]

■ Network: SCTI-B [Staged Crossing B-1 - AM No Project (Network Folder: Cordeaux Dam Road 2023)]

Staged Crossing at T Intersection Type B
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist m				km/h
South: Median Storage														
1	R2	1	0.0	1	0.0	0.001	1.5	LOS A	0.0	0.0	0.28	0.31	0.28	68.6
Approach		1	0.0	1	0.0	0.001	1.5	LOS A	0.0	0.0	0.28	0.31	0.28	68.6
West: Picton Road West														
2	T1	396	50.5	396	50.5	0.270	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
3	R2	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.00	0.70	0.00	70.8
Approach		397	50.4	397	50.4	0.270	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.8
All Vehicles		398	50.3	398	50.3	0.270	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ROUTE TRAVEL PERFORMANCE

➡ Route: R1 [Staged Right Turn to East]

■ Network: SCTI-B [Staged
Crossing B-1 - AM No Project
(Network Folder: Cordeaux Dam
Road 2023)]


Staged Crossing at T Intersection Type B
Network Category: (None)

Route Travel Performance			
Performance Measure	Vehicles	Per Unit Distance	Persons
Travel Speed (Average)	28.8 km/h		28.8 km/h
Travel Distance (Average)	1027.0 m		1027.0 m
Travel Time (Average)	128.5 sec	125.1 sec/km	128.5 sec
Desired Speed (Input)	60.0 km/h		
Route Delay (Average)	11.1 sec	10.8 sec/km	11.1 sec
Route Stop Rate	0.88	0.86 per km	0.88
Route Level of Service (LOS)	LOS E		
Speed Efficiency	0.48		
Travel Time Index	4.22		
Congestion Coefficient	2.08		

Route Travel Movement Performance											
Mov ID	Turn	Trav Dist m	Trav Time sec	Aver. Speed km/h	Aver. Delay sec	Prop. Queued	Eff. Stop Rate	Aver. No. Cycles	Dem. Flow Rate veh/h	Arv. Flow Rate veh/h	Deg. of Satn
Site ID: S1-1											
Site Name: S1-1 NSW - AM No Project											
South Approach											
2	T1	510.0	101.4	18.1	9.6	0.74	0.57	0.74	1	1	0.003
Site ID: S1-2											
Site Name: S1-2 NSW - AM No Project											
South Approach											
1	R2	517.0	27.1	68.6	1.5	0.28	0.31	0.28	1	1	0.001

MOVEMENT SUMMARY

 **Site: S1-1 [S1-1 NSW - AM With Project (Site Folder: Cordeaux Dam Road 2023)]**

 **Network: SCTI-B [Staged Crossing B-1 - AM With Project (Network Folder: Cordeaux Dam Road 2023)]**

Staged Crossing at T Intersection Type B
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Cordeaux Dam Road														
1	L2	1	0.0	1	0.0	0.002	9.7	LOS A	0.0	0.0	0.62	0.64	0.62	58.2
2	T1	12	18.2	12	18.2	0.044	13.0	LOS A	0.1	0.5	0.78	0.78	0.78	17.5
Approach		13	16.7	13	16.7	0.044	12.8	LOS A	0.1	0.5	0.77	0.77	0.77	19.6
East: Picton Road East														
3	L2	40	5.3	40	5.3	0.022	8.0	LOS A	0.0	0.0	0.00	0.66	0.00	72.6
4	T1	720	30.3	720	30.3	0.442	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.6
Approach		760	28.9	760	28.9	0.442	0.5	NA	0.0	0.0	0.00	0.03	0.00	97.7
North: Median Storage														
5	T1	1	0.0	1	0.0	0.002	4.3	LOS A	0.0	0.0	0.62	0.44	0.62	47.2
Approach		1	0.0	1	0.0	0.002	4.3	LOS A	0.0	0.0	0.62	0.44	0.62	47.2
All Vehicles		774	28.7	774	28.7	0.442	0.7	NA	0.1	0.5	0.01	0.05	0.01	94.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: S1-2 [S1-2 NSW - AM With Project (Site Folder: Cordeaux Dam Road 2023)]

Network: SCTI-B [Staged Crossing B-1 - AM With Project (Network Folder: Cordeaux Dam Road 2023)]

Staged Crossing at T Intersection Type B
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec	[Veh. veh	Dist m					
South: Median Storage														
1	R2	12	18.2	12	18.2	0.011	1.7	LOS A	0.0	0.1	0.30	0.36	0.30	56.9
Approach		12	18.2	12	18.2	0.011	1.7	LOS A	0.0	0.1	0.30	0.36	0.30	56.9
West: Picton Road West														
2	T1	396	50.5	396	50.5	0.270	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
3	R2	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.00	0.70	0.00	70.8
Approach		397	50.4	397	50.4	0.270	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.8
All Vehicles		408	49.5	408	49.5	0.270	0.1	NA	0.0	0.1	0.01	0.01	0.01	98.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ROUTE TRAVEL PERFORMANCE

➡ Route: R1 [Staged Right Turn to East]

■ Network: SCTI-B [Staged Crossing B-1 - AM With Project (Network Folder: Cordeaux Dam Road 2023)]


Staged Crossing at T Intersection Type B
Network Category: (None)

Route Travel Performance			
Performance Measure	Vehicles	Per Unit Distance	Persons
Travel Speed (Average)	26.9 km/h		26.9 km/h
Travel Distance (Average)	1027.0 m		1027.0 m
Travel Time (Average)	137.5 sec	133.9 sec/km	137.5 sec
Desired Speed (Input)	60.0 km/h		
Route Delay (Average)	14.7 sec	14.4 sec/km	14.7 sec
Route Stop Rate	1.14	1.11 per km	1.14
Route Level of Service (LOS)	LOS E		
Speed Efficiency	0.45		
Travel Time Index	3.87		
Congestion Coefficient	2.23		

Route Travel Movement Performance											
Mov ID	Turn	Trav Dist m	Trav Time sec	Aver. Speed km/h	Aver. Delay sec	Prop. Queued	Eff. Stop Rate	Aver. No. Cycles	Dem. Flow Rate veh/h	Arv. Flow Rate veh/h	Deg. of Satn
Site ID: S1-1											
Site Name: S1-1 NSW - AM With Project											
South Approach											
2	T1	510.0	104.8	17.5	13.0	0.78	0.78	0.78	12	12	0.044
Site ID: S1-2											
Site Name: S1-2 NSW - AM With Project											
South Approach											
1	R2	517.0	32.7	56.9	1.7	0.30	0.36	0.30	12	12	0.011

MOVEMENT SUMMARY

 **Site: S1-1 [S1-1 NSW - PM No Project (Site Folder: Cordeaux Dam Road 2023)]**

 **Network: SCTI-B [Staged Crossing B-1 - PM No Project (Network Folder: Cordeaux Dam Road 2023)]**

Staged Crossing at T Intersection Type B
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Cordeaux Dam Road														
1	L2	1	0.0	1	0.0	0.002	11.9	LOS A	0.0	0.0	0.72	0.71	0.72	56.2
2	T1	1	0.0	1	0.0	0.005	15.5	LOS B	0.0	0.0	0.83	0.71	0.83	17.1
Approach		2	0.0	2	0.0	0.005	13.7	LOS A	0.0	0.0	0.78	0.71	0.78	31.9
East: Picton Road East														
3	L2	1	0.0	1	0.0	0.001	7.8	LOS A	0.0	0.0	0.00	0.66	0.00	75.3
4	T1	889	23.4	889	23.4	0.526	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.5
Approach		891	23.4	891	23.4	0.526	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.5
North: Median Storage														
5	T1	1	0.0	1	0.0	0.002	6.3	LOS A	0.0	0.0	0.71	0.56	0.71	45.0
Approach		1	0.0	1	0.0	0.002	6.3	LOS A	0.0	0.0	0.71	0.56	0.71	45.0
All Vehicles		894	23.3	894	23.3	0.526	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▼ Site: S1-2 [S1-2 NSW - PM No Project (Site Folder: Cordeaux Dam Road 2023)]

■ Network: SCTI-B [Staged Crossing B-1 - PM No Project (Network Folder: Cordeaux Dam Road 2023)]

Staged Crossing at T Intersection Type B
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist m				
South: Median Storage														
1	R2	1	0.0	1	0.0	0.002	4.3	LOS A	0.0	0.0	0.63	0.60	0.63	62.3
Approach		1	0.0	1	0.0	0.002	4.3	LOS A	0.0	0.0	0.63	0.60	0.63	62.3
West: Picton Road West														
2	T1	1088	18.6	1088	18.6	0.626	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.3
3	R2	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.00	0.70	0.00	70.8
Approach		1089	18.6	1089	18.6	0.626	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.3
All Vehicles		1091	18.5	1091	18.5	0.626	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ROUTE TRAVEL PERFORMANCE

➡ Route: R1 [Staged Right Turn to East]

■ Network: SCTI-B [Staged Crossing B-1 - PM No Project (Network Folder: Cordeaux Dam Road 2023)]


Staged Crossing at T Intersection Type B
Network Category: (None)

Route Travel Performance			
Performance Measure	Vehicles	Per Unit Distance	Persons
Travel Speed (Average)	27.0 km/h		27.0 km/h
Travel Distance (Average)	1027.0 m		1027.0 m
Travel Time (Average)	137.1 sec	133.5 sec/km	137.1 sec
Desired Speed (Input)	60.0 km/h		
Route Delay (Average)	19.7 sec	19.2 sec/km	19.7 sec
Route Stop Rate	1.31	1.28 per km	1.31
Route Level of Service (LOS)	LOS E		
Speed Efficiency	0.45		
Travel Time Index	3.88		
Congestion Coefficient	2.23		

Route Travel Movement Performance											
Mov ID	Turn	Trav Dist m	Trav Time sec	Aver. Speed km/h	Aver. Delay sec	Prop. Queued	Eff. Stop Rate	Aver. No. Cycles	Dem. Flow Rate veh/h	Arv. Flow Rate veh/h	Deg. of Satn
Site ID: S1-1											
Site Name: S1-1 NSW - PM No Project											
South Approach											
2	T1	510.0	107.3	17.1	15.5	0.83	0.71	0.83	1	1	0.005
Site ID: S1-2											
Site Name: S1-2 NSW - PM No Project											
South Approach											
1	R2	517.0	29.9	62.3	4.3	0.63	0.60	0.63	1	1	0.002

MOVEMENT SUMMARY

 **Site: S1-1 [S1-1 NSW - PM With Project (Site Folder: Cordeaux Dam Road 2023)]**

 **Network: SCTI-B [Staged Crossing B-1 - PM With Project (Network Folder: Cordeaux Dam Road 2023)]**

Staged Crossing at T Intersection Type B
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Cordeaux Dam Road														
1	L2	1	0.0	1	0.0	0.002	11.9	LOS A	0.0	0.0	0.72	0.71	0.72	56.2
2	T1	40	5.3	40	5.3	0.197	19.0	LOS B	0.3	2.0	0.86	0.89	0.90	16.6
Approach		41	5.1	41	5.1	0.197	18.8	LOS B	0.3	2.0	0.86	0.88	0.89	17.2
East: Picton Road East														
3	L2	12	18.2	12	18.2	0.007	8.3	LOS A	0.0	0.0	0.00	0.66	0.00	68.2
4	T1	889	23.4	889	23.4	0.526	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.5
Approach		901	23.4	901	23.4	0.526	0.2	NA	0.0	0.0	0.00	0.01	0.00	98.9
North: Median Storage														
5	T1	1	0.0	1	0.0	0.002	6.2	LOS A	0.0	0.0	0.71	0.55	0.71	45.0
Approach		1	0.0	1	0.0	0.002	6.2	LOS A	0.0	0.0	0.71	0.55	0.71	45.0
All Vehicles		943	22.5	943	22.5	0.526	1.0	NA	0.3	2.0	0.04	0.05	0.04	89.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▼ Site: S1-2 [S1-2 NSW - PM With Project (Site Folder: Cordeaux Dam Road 2023)]

■ Network: SCTI-B [Staged Crossing B-1 - PM With Project (Network Folder: Cordeaux Dam Road 2023)]

Staged Crossing at T Intersection Type B
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist m				km/h
South: Median Storage														
1	R2	40	5.3	40	5.3	0.073	4.9	LOS A	0.1	0.5	0.66	0.73	0.66	57.5
Approach		40	5.3	40	5.3	0.073	4.9	LOS A	0.1	0.5	0.66	0.73	0.66	57.5
West: Picton Road West														
2	T1	1088	18.6	1088	18.6	0.626	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.3
3	R2	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.00	0.70	0.00	70.8
Approach		1089	18.6	1089	18.6	0.626	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.3
All Vehicles		1129	18.1	1129	18.1	0.626	0.3	NA	0.1	0.5	0.02	0.03	0.02	98.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ROUTE TRAVEL PERFORMANCE

➡ Route: R1 [Staged Right Turn to East]

■ Network: SCTI-B [Staged Crossing B-1 - PM With Project (Network Folder: Cordeaux Dam Road 2023)]

Staged Crossing at T Intersection Type B
Network Category: (None)

Route Travel Performance			
Performance Measure	Vehicles	Per Unit Distance	Persons
Travel Speed (Average)	25.8 km/h		25.8 km/h
Travel Distance (Average)	1027.0 m		1027.0 m
Travel Time (Average)	143.1 sec	139.4 sec/km	143.1 sec
Desired Speed (Input)	60.0 km/h		
Route Delay (Average)	23.9 sec	23.3 sec/km	23.9 sec
Route Stop Rate	1.62	1.58 per km	1.62
Route Level of Service (LOS)	LOS E		
Speed Efficiency	0.43		
Travel Time Index	3.67		
Congestion Coefficient	2.32		

Route Travel Movement Performance											
Mov ID	Turn	Trav Dist m	Trav Time sec	Aver. Speed km/h	Aver. Delay sec	Prop. Queued	Eff. Stop Rate	Aver. No. Cycles	Dem. Flow Rate veh/h	Arv. Flow Rate veh/h	Deg. of Satn
Site ID: S1-1											
Site Name: S1-1 NSW - PM With Project											
South Approach											
2	T1	510.0	110.8	16.6	19.0	0.86	0.89	0.90	40	40	0.197
Site ID: S1-2											
Site Name: S1-2 NSW - PM With Project											
South Approach											
1	R2	517.0	32.4	57.5	4.9	0.66	0.73	0.66	40	40	0.073

MOVEMENT SUMMARY

Site: S1-2 [S1-2 NSW - AM PEAK 8-9 Water West (Site Folder: Cordeaux Dam Road 2023)]

Network: SCTI-B [Staged Crossing B-1 - AM PEAK 8-9 Water West (Network Folder: Cordeaux Dam Road 2023 - Water West)]

Staged Crossing at T Intersection Type B
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist m				
South: Median Storage														
1	R2	3	66.7	3	66.7	0.007	5.5	LOS A	0.0	0.1	0.62	0.64	0.62	37.3
Approach		3	66.7	3	66.7	0.007	5.5	LOS A	0.0	0.1	0.62	0.64	0.62	37.3
West: Picton Road West														
2	T1	828	29.2	828	29.2	0.506	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.5
3	R2	7	85.7	7	85.7	0.006	10.0	LOS A	0.0	0.0	0.00	0.71	0.00	70.8
Approach		836	29.7	836	29.7	0.506	0.2	NA	0.0	0.0	0.00	0.01	0.00	99.4
All Vehicles		839	29.9	839	29.9	0.506	0.2	NA	0.0	0.1	0.00	0.01	0.00	99.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: S1-1 [S1-1 NSW - AM PEAK 8-9 Water West (Site Folder: Cordeaux Dam Road 2023)]**

Network: SCTI-B [Staged Crossing B-1 - AM PEAK 8-9 Water West (Network Folder: Cordeaux Dam Road 2023 - Water West)]

Staged Crossing at T Intersection Type B
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Cordeaux Dam Road														
1	L2	7	85.7	7	85.7	0.030	20.0	LOS B	0.0	0.5	0.79	0.91	0.79	38.8
2	T1	3	66.7	3	66.7	0.024	26.1	LOS B	0.0	0.3	0.86	0.86	0.86	15.6
Approach		11	80.0	11	80.0	0.030	21.9	LOS B	0.0	0.5	0.81	0.89	0.81	30.7
East: Picton Road East														
3	L2	3	66.7	3	66.7	0.003	9.6	LOS A	0.0	0.0	0.00	0.66	0.00	55.6
4	T1	755	29.8	755	29.8	0.462	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.6
Approach		758	30.0	758	30.0	0.462	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.3
North: Median Storage														
5	T1	7	85.7	7	85.7	0.031	13.1	LOS A	0.0	0.5	0.78	0.78	0.78	35.1
Approach		7	85.7	7	85.7	0.031	13.1	LOS A	0.0	0.5	0.78	0.78	0.78	35.1
All Vehicles		776	31.2	776	31.2	0.462	0.5	NA	0.0	0.5	0.02	0.02	0.02	95.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ROUTE TRAVEL PERFORMANCE

➡ Route: R1 [Staged Right Turn to East]

■ Network: SCTI-B [Staged Crossing B-1 - AM PEAK 8-9 Water West (Network Folder: Cordeaux Dam Road 2023 - Water West)]

Staged Crossing at T Intersection Type B
Network Category: (None)

Route Travel Performance			
Performance Measure	Vehicles	Per Unit Distance	Persons
Travel Speed (Average)	22.0 km/h		22.0 km/h
Travel Distance (Average)	1027.0 m		1027.0 m
Travel Time (Average)	167.8 sec	163.3 sec/km	167.8 sec
Desired Speed (Input)	60.0 km/h		
Route Delay (Average)	31.6 sec	30.8 sec/km	31.6 sec
Route Stop Rate	1.50	1.46 per km	1.50
Route Level of Service (LOS)	LOS E		
Speed Efficiency	0.37		
Travel Time Index	2.97		
Congestion Coefficient	2.72		

Route Travel Movement Performance												
Mov ID	Turn	Trav Dist m	Trav Time sec	Aver. Speed km/h	Aver. Delay sec	Prop. Queued	Eff. Stop Rate	Aver. No. Cycles	Dem. Flow Rate veh/h	Arv. Flow Rate veh/h	Deg. of Satn	
Site ID: S1-1 Site Name: S1-1 NSW - AM PEAK 8-9 Water West												
South Approach												
2	T1	510.0	117.9	15.6	26.1	0.86	0.86	0.86	3	3	0.024	
Site ID: S1-2 Site Name: S1-2 NSW - AM PEAK 8-9 Water West												
South Approach												
1	R2	517.0	49.8	37.3	5.5	0.62	0.64	0.62	3	3	0.007	


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MOVEMENT SUMMARY

 **Site: S1-2 [S1-2 NSW - PM With Project - Water West (Site Folder: Cordeaux Dam Road 2023)]**

 **Network: SCTI-B [Staged Crossing B-1 - PM PEAK 4-5 Water West (Network Folder: Cordeaux Dam Road 2023 - Water West)]**

Staged Crossing at T Intersection Type B
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist m				km/h
South: Median Storage														
1	R2	40	5.3	40	5.3	0.073	4.9	LOS A	0.1	0.5	0.66	0.73	0.66	57.5
Approach		40	5.3	40	5.3	0.073	4.9	LOS A	0.1	0.5	0.66	0.73	0.66	57.5
West: Picton Road West														
2	T1	1088	18.6	1088	18.6	0.626	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.3
3	R2	7	85.7	7	85.7	0.006	10.0	LOS A	0.0	0.0	0.00	0.71	0.00	70.8
Approach		1096	19.0	1096	19.0	0.626	0.2	NA	0.0	0.0	0.00	0.00	0.00	99.1
All Vehicles		1136	18.5	1136	18.5	0.626	0.4	NA	0.1	0.5	0.02	0.03	0.02	97.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: S1-1 [S1-1 NSW - PM With Project - Water West (Site Folder: Cordeaux Dam Road 2023)]**

Network: SCTI-B [Staged Crossing B-1 - PM PEAK 4-5 Water West (Network Folder: Cordeaux Dam Road 2023 - Water West)]

Staged Crossing at T Intersection Type B
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Cordeaux Dam Road														
1	L2	7	85.7	7	85.7	0.045	27.1	LOS B	0.1	0.7	0.86	0.94	0.86	36.1
2	T1	40	5.3	40	5.3	0.198	19.1	LOS B	0.3	2.0	0.86	0.89	0.90	16.6
Approach		47	17.8	47	17.8	0.198	20.3	LOS B	0.3	2.0	0.86	0.89	0.89	19.4
East: Picton Road East														
3	L2	12	18.2	12	18.2	0.007	8.3	LOS A	0.0	0.0	0.00	0.66	0.00	68.2
4	T1	889	23.4	889	23.4	0.526	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.5
Approach		901	23.4	901	23.4	0.526	0.2	NA	0.0	0.0	0.00	0.01	0.00	98.9
North: Median Storage														
5	T1	7	85.7	7	85.7	0.045	19.6	LOS B	0.1	0.6	0.85	0.85	0.85	31.3
Approach		7	85.7	7	85.7	0.045	19.6	LOS B	0.1	0.6	0.85	0.85	0.85	31.3
All Vehicles		956	23.6	956	23.6	0.526	1.3	NA	0.3	2.0	0.05	0.06	0.05	87.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ROUTE TRAVEL PERFORMANCE

➡ Route: R1 [Staged Right Turn to East]

■ Network: SCTI-B [Staged Crossing B-1 - PM PEAK 4-5 Water West (Network Folder: Cordeaux Dam Road 2023 - Water West)]

Staged Crossing at T Intersection Type B
Network Category: (None)

Route Travel Performance			
Performance Measure	Vehicles	Per Unit Distance	Persons
Travel Speed (Average)	25.8 km/h		25.8 km/h
Travel Distance (Average)	1027.0 m		1027.0 m
Travel Time (Average)	143.2 sec	139.5 sec/km	143.2 sec
Desired Speed (Input)	60.0 km/h		
Route Delay (Average)	24.0 sec	23.4 sec/km	24.0 sec
Route Stop Rate	1.62	1.58 per km	1.62
Route Level of Service (LOS)	LOS E		
Speed Efficiency	0.43		
Travel Time Index	3.67		
Congestion Coefficient	2.32		

Route Travel Movement Performance											
Mov ID	Turn	Trav Dist m	Trav Time sec	Aver. Speed km/h	Aver. Delay sec	Prop. Queued	Eff. Stop Rate	Aver. No. Cycles	Dem. Flow Rate veh/h	Arv. Flow Rate veh/h	Deg. of Satn
Site ID: S1-1											
Site Name: S1-1 NSW - PM With Project - Water West											
South Approach											
2	T1	510.0	110.9	16.6	19.1	0.86	0.89	0.90	40	40	0.198
Site ID: S1-2											
Site Name: S1-2 NSW - PM With Project - Water West											
South Approach											
1	R2	517.0	32.4	57.5	4.9	0.66	0.73	0.66	40	40	0.073

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MOVEMENT SUMMARY

Site: S1-2 [S1-2 NSW - AM PEAK 8-9 East (Site Folder: Cordeaux Dam Road 2023)]

Network: SCTI-B [Staged Crossing B-1 - AM PEAK 8-9 Water East (Network Folder: Cordeaux Dam Road 2023 - Water East)]

Staged Crossing at T Intersection Type B
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist m				km/h
South: Median Storage														
1	R2	9	88.9	9	88.9	0.025	6.9	LOS A	0.0	0.3	0.66	0.73	0.66	32.4
Approach		9	88.9	9	88.9	0.025	6.9	LOS A	0.0	0.3	0.66	0.73	0.66	32.4
West: Picton Road West														
2	T1	828	29.2	828	29.2	0.506	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.5
3	R2	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.00	0.70	0.00	70.8
Approach		829	29.2	829	29.2	0.506	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.5
All Vehicles		839	29.9	839	29.9	0.506	0.2	NA	0.0	0.3	0.01	0.01	0.01	98.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.


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MOVEMENT SUMMARY

 **Site: S1-1 [S1-1 NSW - AM PEAK 8-9 East (Site Folder: Cordeaux Dam Road 2023)]**

 **Network: SCTI-B [Staged Crossing B-1 - AM PEAK 8-9 Water East (Network Folder: Cordeaux Dam Road 2023 - Water East)]**

Staged Crossing at T Intersection Type B
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Cordeaux Dam Road														
1	L2	1	0.0	1	0.0	0.002	10.1	LOS A	0.0	0.0	0.65	0.66	0.65	57.8
2	T1	9	88.9	9	88.9	0.091	35.0	LOS C	0.1	1.4	0.89	0.89	0.89	14.5
Approach		11	80.0	11	80.0	0.091	32.5	LOS C	0.1	1.4	0.86	0.87	0.86	16.8
East: Picton Road East														
3	L2	9	88.9	9	88.9	0.008	10.1	LOS A	0.0	0.0	0.00	0.67	0.00	51.2
4	T1	755	29.8	755	29.8	0.462	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.6
Approach		764	30.6	764	30.6	0.462	0.2	NA	0.0	0.0	0.00	0.01	0.00	98.5
North: Median Storage														
5	T1	1	0.0	1	0.0	0.002	4.6	LOS A	0.0	0.0	0.63	0.46	0.63	46.9
Approach		1	0.0	1	0.0	0.002	4.6	LOS A	0.0	0.0	0.63	0.46	0.63	46.9
All Vehicles		776	31.2	776	31.2	0.462	0.6	NA	0.1	1.4	0.01	0.02	0.01	94.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ROUTE TRAVEL PERFORMANCE

➡ Route: R1 [Staged Right Turn to East]

■ Network: SCTI-B [Staged Crossing B-1 - AM PEAK 8-9 Water East (Network Folder: Cordeaux Dam Road 2023 - Water East)]

Staged Crossing at T Intersection Type B
Network Category: (None)

Route Travel Performance			
Performance Measure	Vehicles	Per Unit Distance	Persons
Travel Speed (Average)	20.1 km/h		20.1 km/h
Travel Distance (Average)	1027.0 m		1027.0 m
Travel Time (Average)	184.2 sec	179.3 sec/km	184.2 sec
Desired Speed (Input)	60.0 km/h		
Route Delay (Average)	41.9 sec	40.8 sec/km	41.9 sec
Route Stop Rate	1.62	1.57 per km	1.62
Route Level of Service (LOS)	LOS E		
Speed Efficiency	0.33		
Travel Time Index	2.61		
Congestion Coefficient	2.99		

Route Travel Movement Performance											
Mov ID	Turn	Trav Dist m	Trav Time sec	Aver. Speed km/h	Aver. Delay sec	Prop. Queued	Eff. Stop Rate	Aver. No. Cycles	Dem. Flow Rate veh/h	Arv. Flow Rate veh/h	Deg. of Satn
Site ID: S1-1											
Site Name: S1-1 NSW - AM PEAK 8-9 East											
South Approach											
2	T1	510.0	126.8	14.5	35.0	0.89	0.89	0.89	9	9	0.091
Site ID: S1-2											
Site Name: S1-2 NSW - AM PEAK 8-9 East											
South Approach											
1	R2	517.0	57.4	32.4	6.9	0.66	0.73	0.66	9	9	0.025


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MOVEMENT SUMMARY

 **Site: S1-2 [S1-2 NSW - PM With Project - Water East (Site Folder: Cordeaux Dam Road 2023)]**

 **Network: SCTI-B [Staged Crossing B-1 - PM PEAK 4-5 Water East (Network Folder: Cordeaux Dam Road 2023 - Water East)]**

Staged Crossing at T Intersection Type B
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist m				km/h
South: Median Storage														
1	R2	46	18.2	46	18.2	0.098	5.9	LOS A	0.1	0.7	0.69	0.76	0.69	50.5
Approach		46	18.2	46	18.2	0.098	5.9	LOS A	0.1	0.7	0.69	0.76	0.69	50.5
West: Picton Road West														
2	T1	1088	18.6	1088	18.6	0.626	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.3
3	R2	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.00	0.70	0.00	70.8
Approach		1089	18.6	1089	18.6	0.626	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.3
All Vehicles		1136	18.5	1136	18.5	0.626	0.4	NA	0.1	0.7	0.03	0.03	0.03	97.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.


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MOVEMENT SUMMARY

 **Site: S1-1 [S1-1 NSW - PM With Project - Water East (Site Folder: Cordeaux Dam Road 2023)]**

 **Network: SCTI-B [Staged Crossing B-1 - PM PEAK 4-5 Water East (Network Folder: Cordeaux Dam Road 2023 - Water East)]**

Staged Crossing at T Intersection Type B
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist m				
South: Cordeaux Dam Road														
1	L2	1	0.0	1	0.0	0.002	11.9	LOS A	0.0	0.0	0.72	0.71	0.72	56.2
2	T1	46	18.2	46	18.2	0.274	25.1	LOS B	0.4	3.2	0.89	0.96	1.00	15.7
Approach		47	17.8	47	17.8	0.274	24.8	LOS B	0.4	3.2	0.88	0.96	1.00	16.2
East: Picton Road East														
3	L2	18	47.1	18	47.1	0.013	9.1	LOS A	0.0	0.0	0.00	0.66	0.00	60.1
4	T1	889	23.4	889	23.4	0.526	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	99.5
Approach		907	23.9	907	23.9	0.526	0.3	NA	0.0	0.0	0.00	0.01	0.00	98.2
North: Median Storage														
5	T1	1	0.0	1	0.0	0.002	6.3	LOS A	0.0	0.0	0.71	0.55	0.71	44.9
Approach		1	0.0	1	0.0	0.002	6.3	LOS A	0.0	0.0	0.71	0.55	0.71	44.9
All Vehicles		956	23.6	956	23.6	0.526	1.5	NA	0.4	3.2	0.04	0.06	0.05	86.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ROUTE TRAVEL PERFORMANCE

➡ Route: R1 [Staged Right Turn to East]

■ Network: SCTI-B [Staged Crossing B-1 - PM PEAK 4-5 Water East (Network Folder: Cordeaux Dam Road 2023 - Water East)]

Staged Crossing at T Intersection Type B
Network Category: (None)

Route Travel Performance			
Performance Measure	Vehicles	Per Unit Distance	Persons
Travel Speed (Average)	24.1 km/h		24.1 km/h
Travel Distance (Average)	1027.0 m		1027.0 m
Travel Time (Average)	153.7 sec	149.7 sec/km	153.7 sec
Desired Speed (Input)	60.0 km/h		
Route Delay (Average)	31.0 sec	30.1 sec/km	31.0 sec
Route Stop Rate	1.72	1.68 per km	1.72
Route Level of Service (LOS)	LOS E		
Speed Efficiency	0.40		
Travel Time Index	3.34		
Congestion Coefficient	2.49		

Route Travel Movement Performance											
Mov ID	Turn	Trav Dist m	Trav Time sec	Aver. Speed km/h	Aver. Delay sec	Prop. Queued	Eff. Stop Rate	Aver. No. Cycles	Dem. Flow Rate veh/h	Arv. Flow Rate veh/h	Deg. of Satn
Site ID: S1-1											
Site Name: S1-1 NSW - PM With Project - Water East											
South Approach											
2	T1	510.0	116.9	15.7	25.1	0.89	0.96	1.00	46	46	0.274
Site ID: S1-2											
Site Name: S1-2 NSW - PM With Project - Water East											
South Approach											
1	R2	517.0	36.9	50.5	5.9	0.69	0.76	0.69	46	46	0.098

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