You are invited to attend the next Traffic Committee Meeting:

Date:	**Tuesday, 1 March 2022**
Time:	**2:00 to 4:00pm**
Location:	**Council Chamber**
	62-64 Menangle Street
	Picton NSW 2571

AGENDA

Traffic Committee Meeting

1 March 2022

Order Of Business

1 Reports 4

1.1 Camden Cycle Club - 2022/2023 Cycling Races on Moreton Park Rd, Menangle 4

1.2 Proposed Give Way (R1-2) Intersection Control on Brundah Road at Turner Street, Thirlmere 23

1.3 Douglas Park Drive, Douglas Park - Proposed 370m of Yellow Unbroken (Continuous) Edge Lines on Section of the Road Between 40m North of the Causeway to 280m South of the Causeway over Nepean River 26

1.4 Proposed Access Entry Upgrade into Tahmoor Colliery on Remembrance Driveway, Tahmoor 29

1.5 Proposed Access - Ventilation Shaft and Access Project at 345 Menangle Road, Menangle 52

2 General Business 121

No reports this meeting

1 REPORTS

1.1 CAMDEN CYCLE CLUB - 2022/2023 CYCLING RACES ON MORETON PARK RD, MENANGLE

File Number: 10623#223

EXECUTIVE SUMMARY

The purpose of this report is to request the Local Traffic Committee's endorsement to extend the approval of Camden Cycling Club Inc cycle races along Moreton Park Road, Menangle.

Events are to take place on Saturdays at 2pm and Sundays at 8am, with races lasting two and a half hours. The approval would be granted for races held up until 30 April 2023.

RECOMMENDATION

That:

1. Council grant consent to Camden Cycling Club Inc. to use Moreton Park Rd, Menangle to conduct cycling races for a period up to 30 April 2023, subject to the requirements for the issue of a permit for "Road Event – Road Closure" prior to each individual race event.
2. Council write to the applicant and request they seek their own advice from relevant health authorities for current preventative measures or as to whether the events should proceed due to public safety concerns related to the potential spread of Coronavirus.
3. Should a scheduled event be postponed and the future event date is deemed relevant and appropriate, that the approval is applied to the new date, so long as it falls within a 12 month period from the original scheduled event date.

REPORT

Council has received an application from the Camden Cycling Club seeking an extension approval to conduct cycle races along Moreton Park Rd, Menangle for a period ending on 30 April 2023.

All events are scheduled on weekends with Saturdays starting at 2pm and Sundays starting at 8am, subject to organisational feasibility. Each event duration is two and a half hours.

The club has committed to hold up to 5 events in the 2022 season.

All races will be conducted in a similar manner to previous years. As such, the speed limit is reduced to 60kph for the duration of the event.

Speed limit reduction shall commence 30 minutes prior to the start of the event and shall be removed within 30 minutes of the completion of the event. All signage and appropriate traffic control devices are to be detailed on a Traffic Control Plan (TCP) Implementation. Design of TCPs shall only be undertaken by competent persons who are suitably qualified and authorised.

All riders shall follow the road rules except when 200m from the finishing line and 100m beyond, where more than 2 riding abreast are allowed for the dashing manoeuvre at the end of the race.

The organiser will ensure all riders follow and conform to current COVID guidelines.

Consultation

There were no resident objections to previous cycling races on Moreton Park Rd and no negative feedback received due to the events.

Financial Implications

This matter has no financial impact on Council's adopted budget or forward estimates.

ATTACHMENTS

1. Application letter; Code of Conduct; TGS; COVID strategy and Certificate of insurance.

Camden Cycle Club Inc.

Rhys Clarke
18 Ettlesdale road Spring Farm
2570

0421950116 (MOB)
8th February 2022

General Manager
Wollondilly Shire Council

The Camden Cycle Club would like to apply for a further one-year extension of Road Approval to conduct cycle races along Moreton Park Road Menangle for 2022.

Our mission is to provide the opportunity for the community to participate in the sport of cycling in a safe manner; whilst being considerate to the needs and views of the general public. For this purpose this Traffic Management Plan and a Code of Conduct (see attached) have been developed.

In support of this application is the following;

1. Event Information.
2. Code of Conduct for the club.
3. Notice of intention to Hold a Public Assembly. (Separate document)
4. *Traffic Control Plans – Plan No: WG 0102 & WG 0103 (Separate documents)
5. **Certificate of Currency.

* **Note; revised Traffic Control Plans have been provided with this application.**

** ~~**Note; the current road approval is valid up to and including the 30th April 2022 for Menangle only, Camden Cycle Club respectfully requests that this application be processed through the Local Traffic Committee.**~~

Event Information

Organiser:	Camden Cycle Club.
Sanctioning Organisation:	AusCycling Limited
Type of race:	Option of handicap or graded scratch races
Event Class:	Class 2.
Starting times:	2pm Saturdays and 8am Sundays.

CAMDEN CYCLE CLUB

Event duration: 2 1/2 hours.

Dates of events: The Camden Cycle Club commits to holding no more than 5 events at Menangle and 2022 season. The actual dates to be determined later with an *APPLICATION FOR ROAD EVENTS AND TEMPORARY ROAD CLOSURES PERMIT* to be provided to Council for each event.

Traffic Control Plan: DWG No WG 0102 & WG 0103,
Menangle Traffic Control Plan was prepared by Mr. Danny White of "*WG Traffic Control*".
- Under "*Prepare a Work Zone Traffic Management Plan*" of Card No. 0036560195 with Expiry Date of 13/12/2022; to be revised.

Traffic Speed Limit: 60 km/h
- The club requests approval to reduce the speed limits along Moreton Park Road from 80 km/h to 60 km/h, for the duration of an event.
- Speed Limit reduction shall commence 30 minutes prior to the start of an event and shall be removed within 30 minutes of the completion of an event.

Advisory Signs: - Advisory signs are to be erected, as per TCPs Plan No's WG 0102 & WG 0103, half hour an hour prior to the commencement of races.
- Advisory signs are to be removed within half an hour of the completion of the event.

Traffic Controllers: ;
- 1 at northern end of Moreton Park Road to control traffic at cycle turn-around point and start/finish area, and 1 at southern end of Moreton Park Road to control traffic at cycle turn-around. 1 at the finish line
- All Traffic Controllers to be RMS certified Traffic Controllers.
- All Traffic Controllers to use an approved STOP/SLOW bat.

CAMDEN CYCLE CLUB

	- All Traffic Controllers to wear an approved high visibility safety vest.
Finish line sprints:	It is proposed that for riders to ride more than 2 abreast from 200m from the finish line, to 100m after the finish line. The Traffic Controllers on either side of the finish line shall briefly stop all motor vehicle traffic to allow a safe finish for the riders.
Event Marshals:	Minimum 1; - to provide direction to competitors, - be responsible for crowd control.
Course distance:	Menangle 8.5 km from turnaround to turnaround, with event distances ranging from 30 to 60 km.
Code of Conduct:	The club committee, being duly appointed by the members of the CCC, is in charge at the cycling event. The race committee will administer the cycling events in accordance with the Code of Conduct. See attached copy of Code of Conduct.
First Aid:	A certified First Aider with a fully equipped first aid kit shall be present at all events.
Number of riders:	Generally between 30 and 100.
Age of riders:	The average age of rider is estimated to be 30+ years; however junior's from 13+ years of age may be permitted to ride.
Toilets and refreshments:	The General Store at Menangle has kindly offered their services for toilets and refreshments. On our Interclub day a Port-a-loo will be provided due to expected larger attendance.
Waste disposal:	A waste bin shall be provided, and at the completion of each event, the site will be inspected and cleaned of all rubbish.

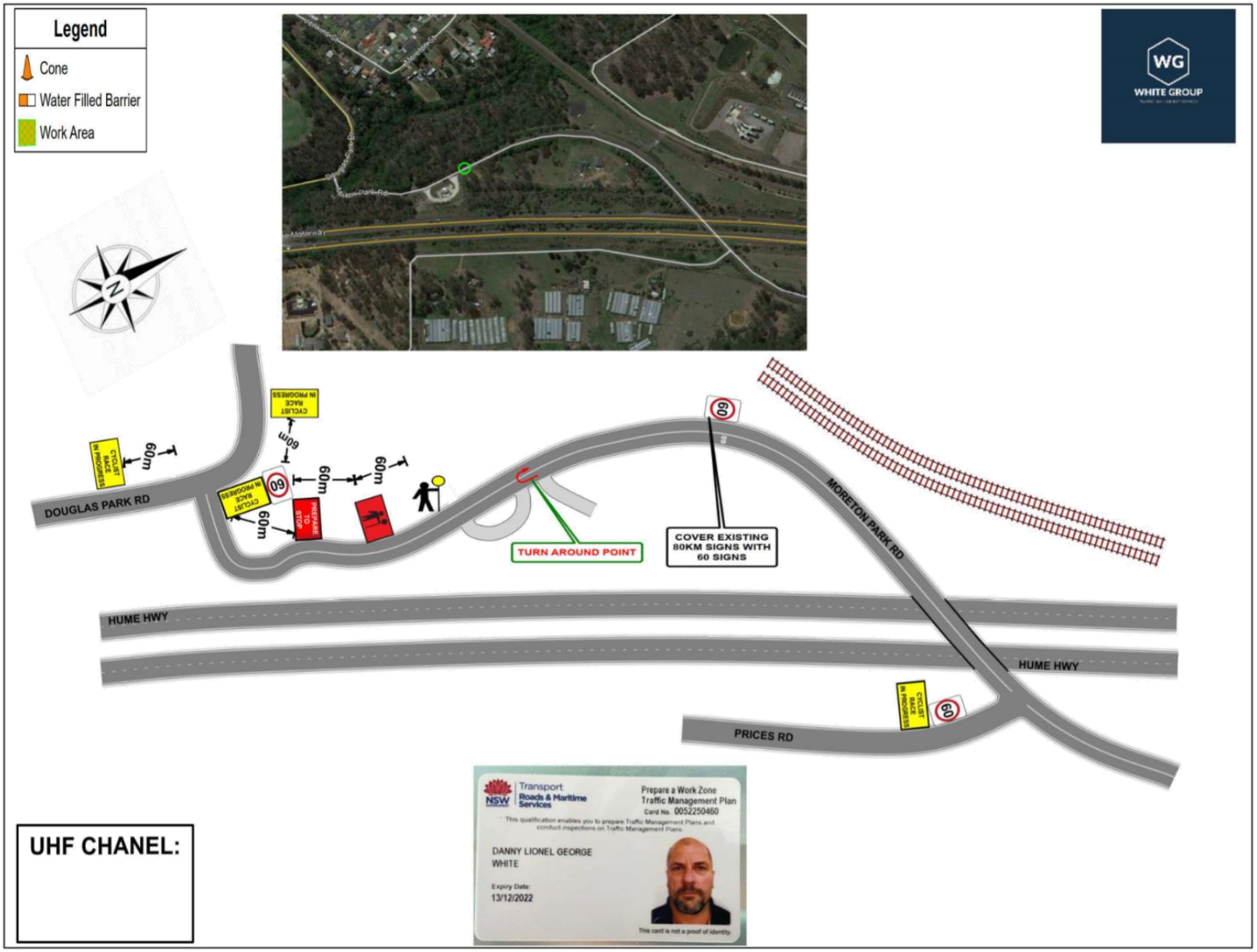
CAMDEN CYCLE CLUB

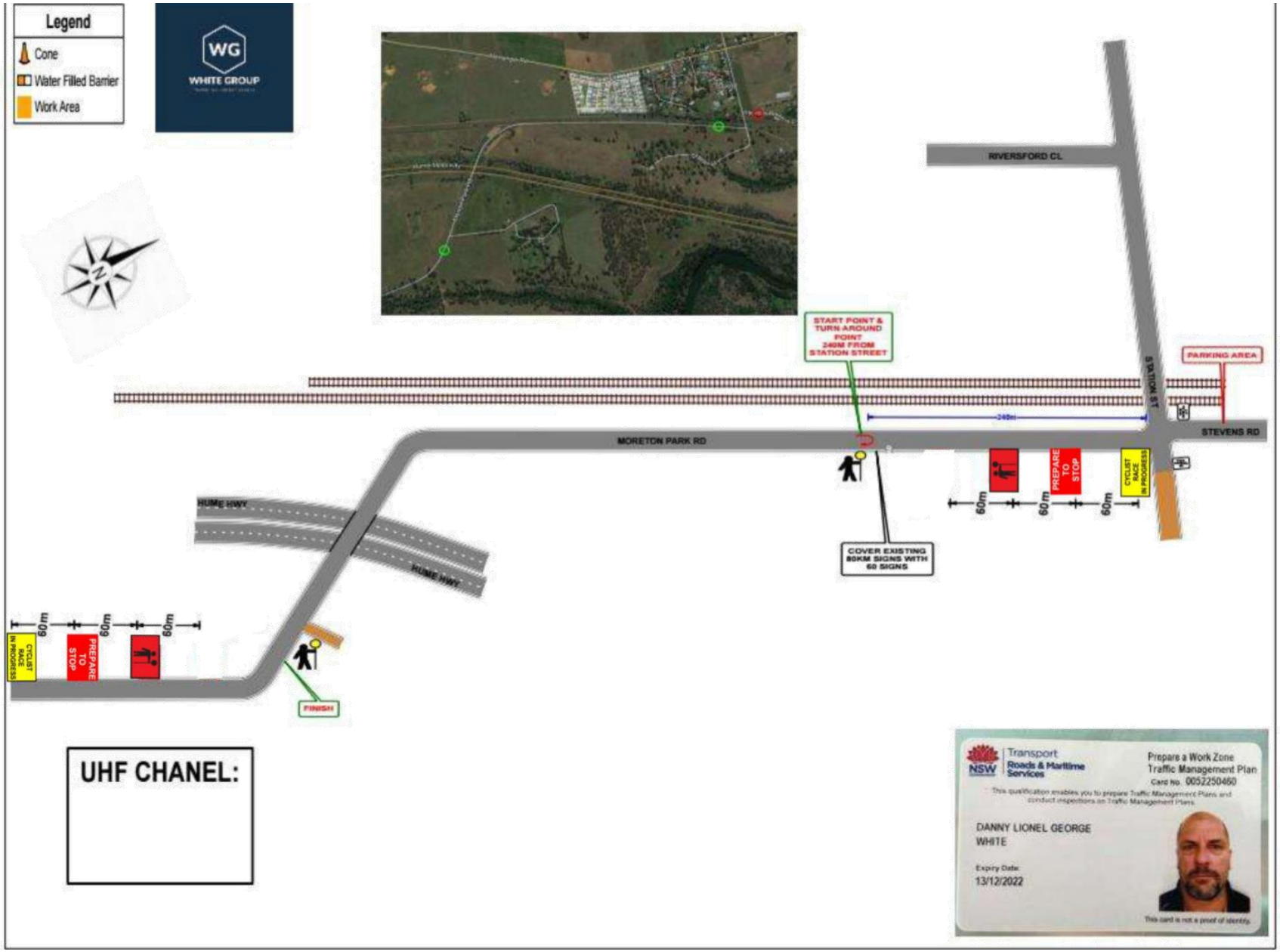
CODE OF CONDUCT

The club committee, being duly appointed by the members of the CCC, is in charge of the cycling event. The committee will administer all cycling events in accordance with this Code of Conduct.

Failure to comply with this Code of Conduct will result in disqualification from the event and possible suspension from racing for a period to be determined by the committee.

- All riders shall comply with the provision of the Australian Road Regulations.
- All riders shall obey the directions of the Traffic Controllers and Marshalls.
- All riders shall have read, be aware of, and comply with the conditions of Road Approval.
- Upon encountering a responding emergency vehicle all riders shall cease racing immediately and comply with the provision of the Australian Road Regulations.
- In the event of a race fall or medical emergency all riders shall cease racing immediate, and to the best of their ability shall;
    - Manage the traffic situation,
    - Render medical assistance,
    - In addition, notify the race committee.
- Riders must ensure that their bicycles are in good mechanical order, and shall not commence, or continue a race, with a faulty bicycle.
- Riders shall not park their motor vehicle on the shoulder of the road, but should obey the directions of the duty marshal in regards to parking.
- The use of offensive or obscene language is not permitted.
- Riding in a dangerous manner is not permitted.
- Loitering on the road at the start/finish line is not permitted.
- Warming up on the race circuit is not permitted after the commencement of the race.
- Riders are responsible to ensure that they remove all waste from the race site.
- Riders shall use the designated toilets provided.
- If a rider withdraws from the event, he/she shall inform the first available Marshall of their withdrawal from the event.
- Riders shall be courteous to all members of the general public.
- Riders shall follow and of the necessary and current covid-19 guidelines


Legend
Cone
Water Filled Barrier
Work Area
WG
WHITE GROUP
N
DOUGLAS PARK RD
CYCLIST RACE IN PROGRESS
60m
60
PREPARE TO STOP
TURN AROUND POINT
COVER EXISTING 80KM SIGNS WITH 60 SIGNS
MORETON PARK RD
HUME HWY
PRICES RD
UHF CHANEL:
Transport NSW Roads & Maritime Services
Prepare a Work Zone Traffic Management Plan
Card No. 0052250460
DANNY LIONEL GEORGE WHITE
Expiry Date:
13/12/2022
This card is not a proof of identity.


Legend
Cone
Water Filled Barrier
Work Area
WG
WHITE GROUP
RIVERSFORD CL
START POINT & TURN AROUND POINT 240M FROM STATION STREET
PARKING AREA
STATION ST
STEVENS RD
MORETON PARK RD
HUME HWY
HUME HWY
240m
60m
60m
60m
PREPARE TO STOP
CYCLIST RACE IN PROGRESS
COVER EXISTING 80KM SIGNS WITH 60 SIGNS
FINISH
UHF CHANEL:
Transport NSW Roads & Maritime Services
Prepare a Work Zone Traffic Management Plan
Card No. 0052250460
This qualification enables you to prepare Traffic Management Plans and conduct inspections on Traffic Management Plans
DANNY LIONEL GEORGE WHITE
Expiry Date:
13/12/2022
This card is not a proof of identity

AUSCYCLING

CONDUCTING EVENTS IN A COVID-19 ENVIRONMENT

Version 2.0 | 27 DECEMBER 2021

1. Introduction

AusCycling ('AC') has developed this guide to support Host Organisation (clubs, event organisers) to conduct events in the COVID-19 environment.

This guide is meant to provide advice, suggestions, and options for events of all sizes. Not all elements and recommendations will be applicable to every situation.

Further, we note that that approaches to COVID-19 have evolved significant. Each State and Territory will have a different approach and timelines on restrictions which may result in different requirements at various times. Ultimately, public health policy and Federal, State and Territory Government directives will govern the conduct of any events.

2. Preliminary Considerations

In the COVID-19 environment there are several considerations that should be taken into account when planning an event:

- **State/Territory COVID19 Status:** When assessing your event, it is critical that you understand the current status of COVID-19 at a national, regional and local level. This does not mean a one-time check – it should be monitored on an ongoing basis. The situation may change at any time and organisers should remain updated with current information.

  State and Territory specific requirements and resources and direction can be found at:
  Australian Capital Territory: https://www.covid19.act.gov.au/
  New South Wales: https://www.nsw.gov.au/covid-19
  Northern Territory: https://coronavirus.nt.gov.au/
  Queensland: https://www.covid19.qld.gov.au/
  South Australia: https://www.covid-19.sa.gov.au/
  Tasmania: https://coronavirus.tas.gov.au/
  Victoria: https://www.dhhs.vic.gov.au/coronavirus
  Western Australia: https://www.wa.gov.au/government/covid-19-coronavirus

- **Travel**: The various travel requirements between states/territories should be well understood when seeking interstate participation.

- **Officials**: The number of officials should be limited to only those who are critical to the conduct of a safe event.

- **Cleaning and Sanitising Requirements**: Taking measures to regularly professionally clean and sanitise any surfaces used. This may add extra time and cost to those putting on an event.

- **Consider an Incremental Return to Normal Operations:** There is a need to have an incremental return over a staged process to normal operations. Any events should slowly progress implementation and if in doubt take a cautious approach.

3. Pre-Event

There are several measures to be undertaken by the Event Organiser prior to the start of the event including:

- Entries: It is recommended that all entries and payments are taken online or via email/electronic communication. Participants should be reminded, at this time, that their contact information may be made available to the State or Territory Health Department in the event of a positive COVID-19 case from one of the participants.
- Numbers: Consider having the participants provide their own numbers and putting it on themselves or provide numbers which will be permanently be kept by the rider. For a series, use one number for the entire series.
- Starters: Develop a start list that ensures the total number of people onsite does not exceed State or Territory restrictions. No matter the length of the course this should be developed to ensure:
    - There are never more people present than are outlined in the State or Territory restrictions.
    - Consider setting specific arrival times for all participants to ensure maximum numbers are not surpassed (generally not more than 15 minutes prior to their start).
    - Ensure all start lists are posted online and/or sent via email to all participants.
- Contact Tracing: Recommend that all participants download and activate the local State/Territory Check-in App in advance.
- Training: Consider for a nominated individual to complete the COVID-19 Infection Control Training.
- Education: Consider signage providing information on:
    - Physical Distancing Guidelines
    - Check-In, Mask and Vaccinate Requirements (as required by government)
    - COVID-19 Symptoms
    - Physical Distancing Markings
    - Venue Specific Movements
    - Hygiene Guidelines
    - Medical Locations and Protocol
    - Mask Requirements

      Resource: Commonwealth Government COVID-19 Posters

- Prepare a contingency plan for absenteeism among volunteers and staff.

3.1 Specific Communication Considerations

Participants should have specific communication regarding their participation including:

- **Briefing**: A virtual briefing or induction document for participants outlining any special practices including:
    - An overview of conditions of participation (numbers, prizing process, arrival times)
    - Provide a reminder on any hygiene practices that will be in place
    - Participants should bring their own food or drink
    - A reminder on 'Get In, Race/Ride, Get Out'
    - Mask, Check-in or Vaccination Requirements

- **COVID-Safe Coordinator:** Consider appointing a COVID-19 Safety Coordinator for the event. This person can be the conduit for all information related to COVID-19 for external parties, participants and staff. This individual can formulate and discuss the current and local impact of the virus, emergency operations plans, and determine how they may impact aspects of your events, such as personnel, security, services and activities, functions, and resources while maintaining coordination with the local health and permitting agencies.
- **Volunteers and Officials**: Conduct a briefing with all officials and volunteers on the requirements outlining any specific practices including:

- Hygiene practices that will be in place
- How to interact with participants
- Provide files such as operations guides, technical manuals and volunteer assignment sheets electronically

3.2 Event Time Strategies

The focus when planning an event should be on '*Get In, Race/Ride*' and include the following strategies:

3.3 Event Generic

- Sanitising alcohol-based dispensers should be provided near the start and finish.
- Have QR code check-in (as required by government).
- Only essential personnel should be appointed to help conduct the event. Commissaires should be limited to the minimum number. Any other volunteers or officials should only be appointed for safety purposes.
- Only essential equipment should be used.
- Food and drink are to be sold/provided in line with State and Territory regulations.
- Riders should be instructed not to hug, high five, touch each other at any point before, during or after their event.
- Provide plenty of bins for riders to throw away their rubbish, and ensure the venue is cleaned thoroughly and regularly.
- Eliminate pre-race sign on. A pre-event roll call can take the place of a sign-on.

3.4 Registration

Event Registration is one of first areas that present a risk. Event organisers should consider this when planning for their event and strive to make sure registration complies with physical distancing requirement. The following are specific recommendations on registration:

- Create a dedicated entrance and exit for limited one-way foot traffic.
- Consider whether a safety ambassador/greeter is needed to keep people from congregating and moving in the prescribed manner.
- Provide hand sanitiser stations and instructions for riders at the entrance and exit of registration.
- Place temporary physical distancing on the ground for queues (to the distance required by the State or Territory regulations)
- Provide hand sanitiser for those picking up their registration packs and those staffing the registration.
- Create the required level of physical distancing between staff/volunteers working registration. This may require expanding your normal space requirement and equipment such as tables and tents.
- Limit physical interaction (paperwork/payment). This may include creating rider packs that allow a handoff without touching the riders hands. All items should be provided in one pack.
- Some larger events may consider the option event packs in advance.

3.5 Spectators

The close proximity of people cheering on riders is normally a sign of a successful and exciting event, may now have specific requirements set by State/Territory Health Departments. When looking to attract spectators consider:

- Provide sanitation and masks for the crowds.
- Implement measures to support compliance with physical distancing in line with State or Territory requirements.
- Understand vaccination requirements for event spectators (as set by State/Territory governments)
- Put up signage providing guidance on:
  - Check-in, Mask or Vaccination Requirements
  - Physical Distancing Guidelines
  - COVID-19 Symptoms
  - Physical Distancing Markings
  - Venue Specific Movements
  - Hygiene Guidelines
  - Medical Locations and Protocols

3.6 Event Specific by Discipline/Event Type

MTB	BMX

• Entry and exit locations (where applicable) should be clearly marked as such.
 	
XCO, OT and CX Specific
• Call up boxes to be large enough to accommodate the required physical distancing requirements.
• Grid distancing set to at least minimum requirements (boxes and rows) at start.
 	
DH/GE Specific
• Shuttle service can be used after a sport-specific structured risk assessment and mitigation process is undertaken.
• Loading and start: Provide queuing that maintains the required physical distancing requirements.
• Separate vehicle load times to maintain physical distancing requirements at shuttle loading area.
	• In staging ensure that the width of each chute is as wide as possible.
	• Riders to disperse immediately after the finish. No congregating at the finish line
	• Consider block racing, if necessary to limit the total number of people onsite, with age groups assigned to blocks based on entries to minimise patrons on site.
	• Consider areas of the venue where only riders can congregate, i.e no parents or supports in registration, finish line or staging.
	• Carefully consider practices when operating club canteen, including:
	  ○ One entry line and 1 exit line
	  ○ Minimise canteen staff and base this off social distancing requirements
	  ○ Gloves to be work at all times by canteen workers

Individual Timed Events (Time Trials, Track Timed Events)	Mass Start Events (Criteriums, Road Races, Handicap, Gran Fondo)	Mass Start Track
• Rely on a start clock beeper with the start official distanced from the rider. **Track Specific** • If using start gates they should be disinfected regularly and ideally between riders. • If not using start gates the holder should be from the same household or one holder should be used for all riders. **Road TT Specific** • Consider having the start and finish in slightly different locations. • Create start times that will allow riders to keep apart on course. • Create specific start area arrival times between groups to eliminate crowding. • Consider eliminating holders and require all riders to start with a foot on the ground.	• Limit interaction of riders entering the course and riders exiting the course. • Eliminate pre-race sign on. A pre-event roll call can take the place of a sign-on. • Consider using one long lap (instead of a short circuit) to eliminate crowding at the finish line. • Ensure there is someone responsible for ensuring people exit the course and '*Get Out*' at the end of the event. **Gran Fondo Specific** • Consider creating a larger start window and letting riders start at their own time within this window. • Assign riders windows to start in smaller groups and avoid multiple groups at the start at one time. **Aid Station Specific** Aid Stations should follow the following recommendations: • Provide bike parking that is adequately spaced in line with physical distancing requirements. • Provide hand sanitiser and instructions for use for all riders at every aid station. • Riders are required to sanitise their hands prior to picking anything up and before they depart the aid station. • Post signs asking riders to remove cycling gloves while in aid station. • Provide hand sanitiser along with instructions for use to staff/volunteers working aid stations. • For shorter events, only individual servings of water should be provided. • Food management should follow the hygiene provisions set by the local health authorities.	• Restrict the number of people allowed in the infield at one time. • Re-organise the traditional program to have access to the velodrome by having different ability or age groups racing at different times. • Provide hand sanitising stations throughout the infield. • Restrict or limit spectators by assigning seating to provide the required distance. • Create one-way travel to the spectating areas to prevent congestion. • Consider eliminating rail starts and allow riders a specific number of laps to bunch for a start or clean the rail after each start.

6

	• The ground should be marked with temporary markings in line with physical distancing requirements to delineate adequate spacing between riders as they line where required. • If self-serve, a rider should not be in position to touch anything other than what they have selected. • Assign separate teams to serve and for collecting used bottles and other disposable items. • Volunteers should have the ability to serve without touching a rider. • It is highly discouraged that any events have a race convoy in the COVID-19 Environment unless they are National Level or above. Convoy specific recommendations include: **Feeding From a Vehicle** • Feeders should use hand sanitiser before and after the event and to use gloves while feeding. • One person should be appointed as the only feeder in each vehicle. re **Mechanical Assistance** • Riders should carry the equipment necessary to fix any minor mechanical issues (e.g. flat tyre). • If neutral spares are used the following is recommended: o A wheel should be disinfected before use o The neutral mechanic should use hand santiniser before and after any repair o Any returned wheels should be disinfected after use. **Sag Wagon (Vehicle Collecting Riders Unable to Complete the Course)**	

7

	• Ensure the vehicle is large enough to accommodate the physical distancing requirements should riders need to be picked up. If this is not possible the use of masks should be implemented. • Develop a process for loading bike into vehicle (e.g. rider must load own bike or one person is allocated to this task)	

3.1 Feed Zones (Road and MTB)

Feed zones are highly discouraged in a COVID-19 environment. It is recommended these are only in place for events that are UCI sanctioned. For those events with a feed zone the following are recommended:

- Provide hand sanitiser for all feeders. Feeders should use hand sanitiser prior to entering and exiting the feed zone.
- Limit the feed zone to one (1) feeder per rider in the current field or three (3) per team (whichever is less).
- Consider providing times for when feeders can be in the feed zone with credentials for timed access.
- Place temporary markings on the ground, creating boxes providing gap between feeders to the physical distancing requirements.
- Provide a one-way travel lane for feeders to get in and an alternative way out of the feed area.
- Require athletes to dispose of bottles or wrappers after the feed zone in the Litter Zone to prevent feeders from leaving their spaces and to prevent spray from discarded bottles.
- Station one person in the 'Litter Zone' with the appropriate safety equipment to clean up.
- All disposed bottles should be put directly into the bin.
- No neutral water should be offered unless deemed a safety issue due to weather.

4. Post-Event

At the end of the activity participants should '*Get Out*'. The specific protocols include:

- All equipment and surfaces used to conduct the event must be disinfected in line with health standards.
- Presentations must follow
- Warm downs should only occur if physical distancing can be maintained.
- Post all results online (not printed at the venue).

5. Medical Protocols

It is now more important than ever to include your first aid provider in the planning process before the event.

For major events contact the State or Territory Health Department to ensure that the event is operating within the outbreak response and mitigation plan. Contact the local hospital to alert them of the event, and ensure they have the capability to handle trauma patients during a pandemic. Their ability to handle non-COVID-19 patients from your event could have a major impact on the safe management of the event.

- Identify the individual who will be designated to handle any suspected COVID-19 cases.
- Identify a medical area and determine size.
- Determine cleaning procedures for high touch points in the medical area.
- Determine the protocol medical staff will take if they receive a patient.
- Determine the additional steps the medical team will take to protect themselves and the participants.
- Work with your medical team to determine PPE needs.
- Communicate medical protocols with staff and volunteers.
- Inform participants with any special medical protocols, before the event.
- Clearly identify your medical station on site.
- Designate an isolation area for anyone at the event who develops COVID-19 symptoms. Develop a response plan for anyone who may develop COVID-19 symptoms during the event.

6. Who should not attend?

To ensure the health and safety of all participants no participants are to attend if they have had any illness or symptoms of COVID-19 unless they have had a negative COVID19 test.

LET'S RIDE TOGETHER

V Insurance Group Pty Ltd ABN 67 160 126 509
Telephone: +61 2 8599 8660
Fax: +61 2 8599 8661
Direct Line: +61 8599 8667
Email:sports@vinsurancegroup.com
Address: Level 25, 123 Pitt Street
Sydney NSW 2000

7 January 2022

To Whom It May Concern,

CERTIFICATE OF INSURANCE

Dear Sir/Madam,

In our capacity as Insurance Broker to the Named Insured shown below, we confirm having arranged the following insurance, the details of which are correct as at the Issue Date:

Named Insured:	**AusCycling Limited and all affiliated Clubs**
Affiliated Club:	_Please select
Class of Insurance:	Combined Liability Insurance
Insurer:	Certain Underwriters at Lloyds of London
Policy Number:	09014411
Limit of Liability:	
Errors and Omissions	$20,000,000 each and every occurrence and in the aggregate
Public Liability	$20,000,000 each and every occurrence
Products Liability	$20,000,000 each and every occurrence and in the aggregate
Policy Period:	4.00pm, 31 January 2022 to 30 September 2022
Excess:	$1,000
Geographical Limit:	Worldwide

Yours sincerely,

Rob Veale
Managing Director

Disclaimer:
This document has been prepared at the request of our client and does not represent an insurance policy, guarantee or warranty and cannot be relied upon as such. All coverage described is subject to the terms, conditions and limitations of the insurance policy and is issued as a matter of record only. This document does not alter or extend the coverage provided or assume continuity beyond the Expiry Date. It does not confer any rights under the insurance policy to any party. V-Insurance Group is under no obligation to inform any party if the insurance policy is cancelled, assigned or changed after the Issue Date.

1.2 PROPOSED GIVE WAY (R1-2) INTERSECTION CONTROL ON BRUNDAH ROAD AT TURNER STREET, THIRLMERE

File Number: 10623#226

EXECUTIVE SUMMARY

The purpose of this report is to grant approval for the installation of a Give Way (R1-2) sign on Brundah Road at Turner St, Thirlmere. This request is in response to safety concerns raised by residents regarding traffic not giving way at this intersection.

RECOMMENDATION

That Council:

1. Endorse the installation of a Give Way (R1-2) sign and associated line marking (TB; T1; E4 and BB) on Brundah Road at Turner St, Thirlmere.

REPORT

Concerns have been received from residents about safety at the T-intersection of Brundah Road and Turner St, Thirlmere. It has been reported that traffic on Brundah Road fail to give way to traffic from Turner St. Brundah Road is transforming into a residential street, connecting other new local roads, while Turner St is a minor collector road linking to Thirlmere Way.

Traffic volume on Brundah Road has increased due to new housing developments and a formal intersection control will improve safety. Turner Street is the main thoroughfare joining Bell St and Denmead St to Thirlmere Way, connecting Tahmoor and Thirlmere.

It is proposed that Council installs a formal intersection control and install a Give Way sign (R1-2) on Brundah Road and associated line marking (TB; TB1; E4 and BB) in order to improve traffic safety at this intersection.

Consultation

Concerns have been raised by residents about the safety of this T-intersection.

Financial Implications

Funding has been allocated and is available under vote 4402-5210-3627.

ATTACHMENTS

1. Aerial and street view of the poposed Give Way (R1-2) intersection control


Go
Search History
E4
BB
Brundah Rd
TB1
TB
R1-2
Turner St
Bell St


1G Brundah Rd
Thirlmere, New South Wales
View on Google Maps
Close
Brundah Rd
nearmap

1.3 DOUGLAS PARK DRIVE, DOUGLAS PARK - PROPOSED 370M OF YELLOW UNBROKEN (CONTINUOUS) EDGE LINES ON SECTION OF THE ROAD BETWEEN 40M NORTH OF THE CAUSEWAY TO 280M SOUTH OF THE CAUSEWAY OVER NEPEAN RIVER

File Number: 10623#227

EXECUTIVE SUMMARY

The purpose of this report is to request approval for the installation of approximately 370m yellow unbroken (continuous) edge lines to prevent parking on the section of Douglas Park Drive between 40m north of the causeway to 280m south of the causeway over Nepean River. This request is in response to safety concerns raised by residents regarding visitors to the location parking dangerously along this section of road.

RECOMMENDATION

That Council:

1. Endorse the installation of approximately 370m yellow unbroken (continuous) edge lines to prevent parking on the section of Douglas Park Drive between 40m north of the causeway to 280m south of the causeway over Nepean River.

REPORT

Council has been alerted to dangerous driver behaviour by parking along the narrow section of Douglas Park Drive at the causeway over Nepean River. This area is commonly used to visit the popular river foreshore area. This is a popular outdoor area among the local community and it attracts many out of area visitors as well.

During periods of hot weather there are large numbers of visitors to the area and the limited number of off-road parking spaces are unable to satisfy demand. This leads to dangerous parking along the narrow section of road and on the causeway. As a result, residents have expressed safety concerns about the hazardous parking situation and the high potential for accidents. Therefore, parking restrictions along the road have been considered to mitigate the safety issue.

It is proposed to install yellow unbroken (continuous) edge lines on the section of Douglas Park Drive, between 40m north of the causeway to 280m south of the causeway over Nepean River. This is classified as a “No Stopping Line” and is enforceable under the Road Rules.

The installation of No Stopping Signage is problematic due to the narrow road width and all signage in this area is prone to vandalism. The benefit of installing the yellow edge line would be to help reduce the number of signs and other distractions on the road, and reduce maintenance costs.

Consultation

The issue of dangerous parking along this particular section of Douglas Park Road has been brought to Council’s attention by concerned residents.

Financial Implications

Funding has been allocated and is available under vote 4402-5210-3627.

ATTACHMENTS

1. Aerial and Street Views of the Proposed No Stopping Line Marking


Douglas Park Dr, Douglas Park NSW 2569, A
Go
Search History
Proposed 370m unbroken
(continuous) yellow road edgeline
Douglas Park Causeway
Nepean River
M31 - Hume Motorway
Douglas Park Drive


Douglas Park Hwy
nearmap

1.4 PROPOSED ACCESS ENTRY UPGRADE INTO TAHMOOR COLLIERY ON REMEMBRANCE DRIVEWAY, TAHMOOR

File Number: 10623#228

EXECUTIVE SUMMARY

The Local Traffic Committee resolved on 1 February 2022 that additional information on the Tahmoor Colliery access entry upgrade proposal be reviewed at its next meeting.

RECOMMENDATION

That:

1. Council endorse the proposed upgrade works.
2. The attached plans be approved with final details shown on the engineering plans being approved by Council's Development Engineer.
3. Council endorse the proposed Give Way (R1-2) controls; No Stopping (R5-400) zones; and line markings as shown in the attached plan of this report.

REPORT

On 1 February 2022, the Local Traffic Committee resolved additional information be tabled at its next meeting to reconsider the access entry upgrade proposal into Tahmoor Colliery.

Subsequently, the following response has been received from the proponent:

1. Linemarking and signage Drawing updated to include the W5-22 signs in line with Transport for NSW (TfNSW) sign requirement - See attached.
2. Turn paths are located in drawing set supplied to council – See attached.
3. A road safety audit was conducted on the new and existing road alignment. The right-turn bay line of sight issue was not a finding of the report, as such no further assessment is seen to be required – See attached.
4. The pavement design has been completed to TfNSW specifications. Pavement patching has been designed to TfNSW specifications utilising the geotechnical parameters and traffic data, thus will interface correctly with the existing pavement.

Note: In addition to the above the Tahmoor South EIS – App P Traffic Assessment – that formed the basis for the Tahmoor South Mine Project Approval is available upon request.

Consultation

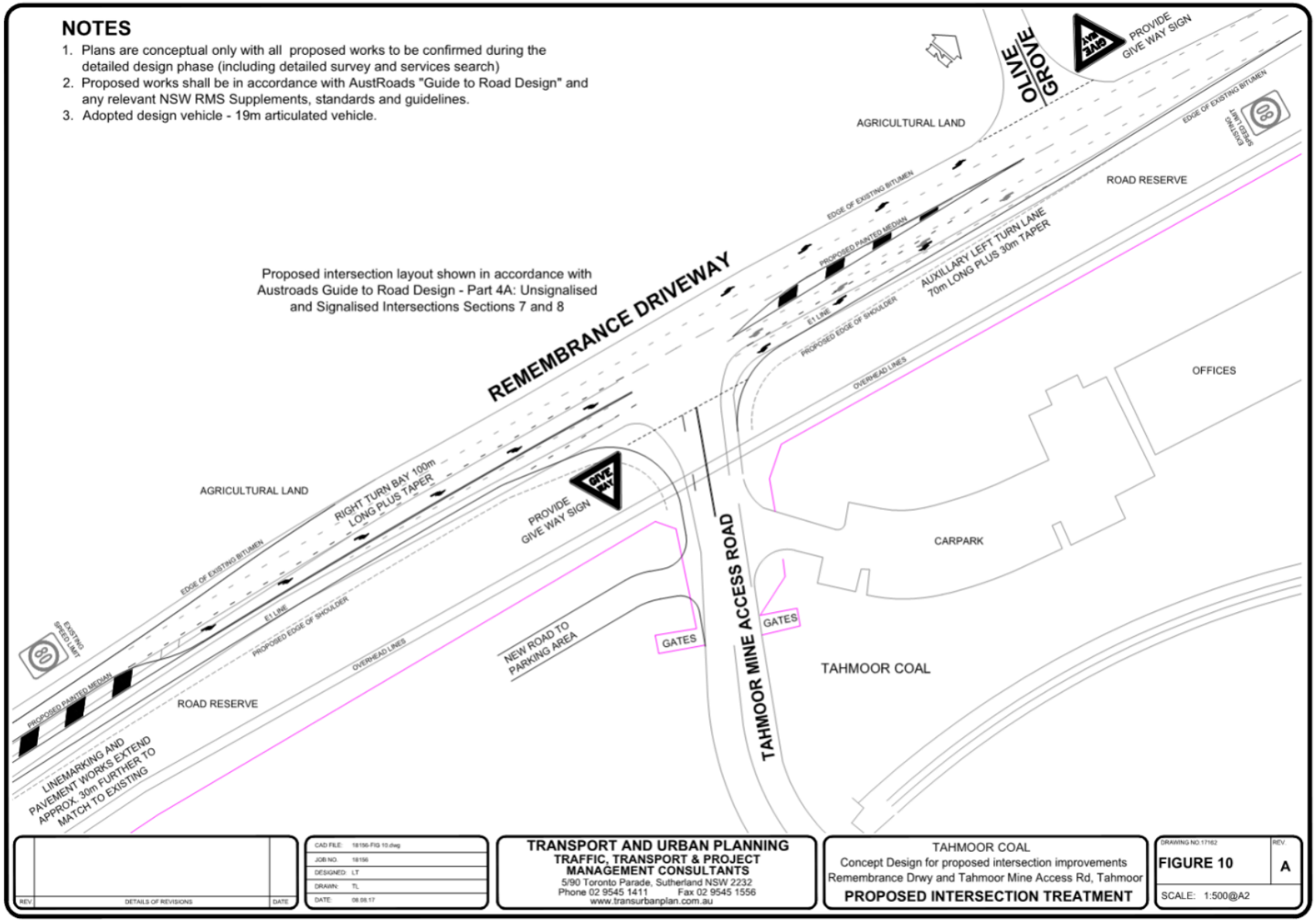
Ongoing discussions with Tahmoor Colliery; Wollondilly Anglican College and Council staff.

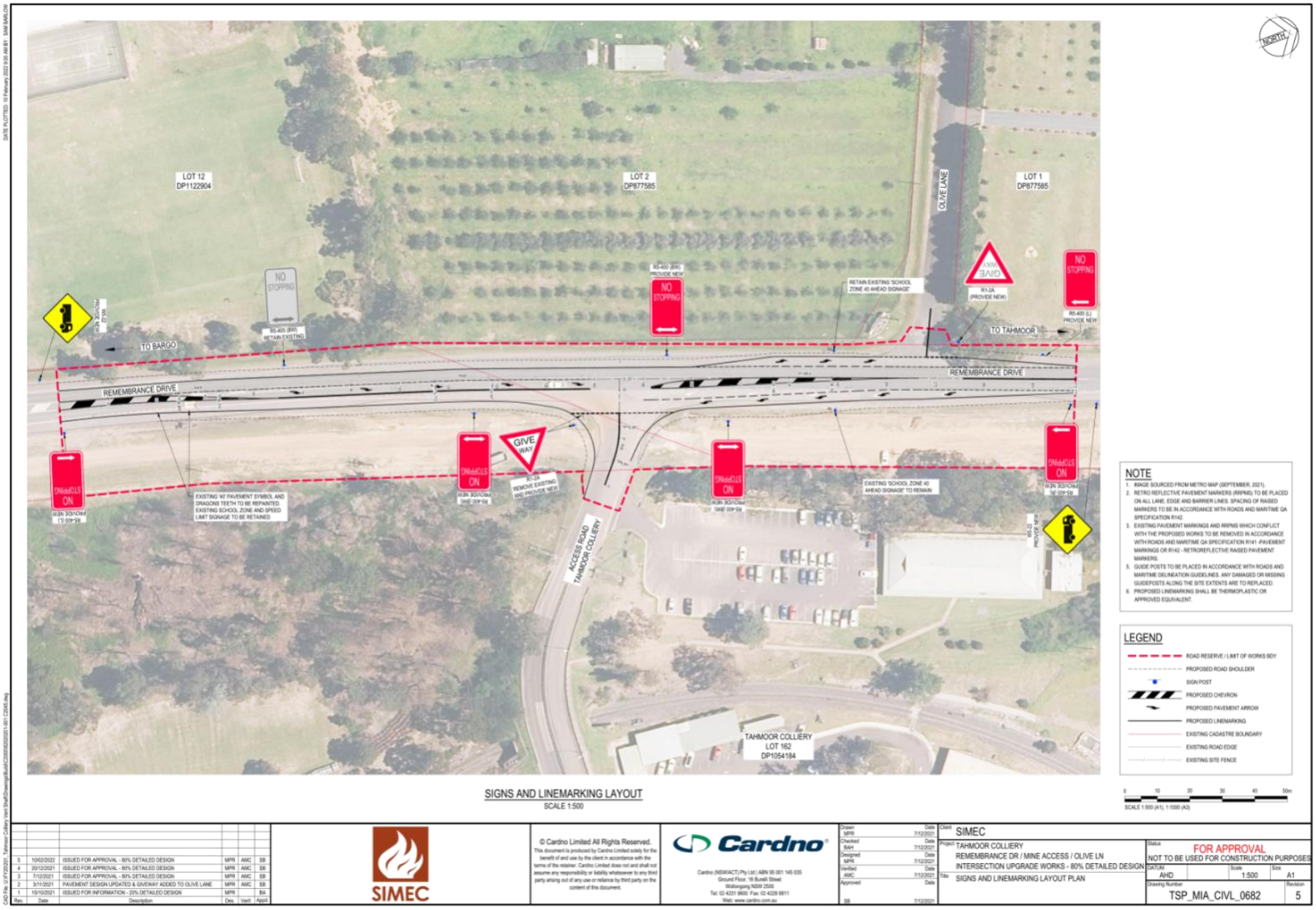
Financial Implications

This matter has no financial impact on Council's adopted budget or forward estimates.

ATTACHMENTS

1. Line marking and signage plan; turning paths; Road Safety Audit Report and Traffic Impact Statement report cover sheet and index


NOTES
1. Plans are conceptual only with all proposed works to be confirmed during the detailed design phase (including detailed survey and services search)
2. Proposed works shall be in accordance with AustRoads "Guide to Road Design" and any relevant NSW RMS Supplements, standards and guidelines.
3. Adopted design vehicle - 19m articulated vehicle.
Proposed intersection layout shown in accordance with Austroads Guide to Road Design - Part 4A: Unsignalised and Signalised Intersections Sections 7 and 8
REMEMBRANCE DRIVEWAY
OLIVE GROVE
PROVIDE GIVE WAY SIGN
AGRICULTURAL LAND
ROAD RESERVE
EDGE OF EXISTING BITUMEN
PROPOSED PAINTED MEDIAN
E1 LINE
PROPOSED EDGE OF SHOULDER
AUXILLARY LEFT TURN LANE 70m LONG PLUS 30m TAPER
OVERHEAD LINES
OFFICES
CARPARK
RIGHT TURN BAY 100m LONG PLUS TAPER
PROVIDE GIVE WAY SIGN
NEW ROAD TO PARKING AREA
GATES
TAHMOOR MINE ACCESS ROAD
TAHMOOR COAL
LINEMARKING AND PAVEMENT WORKS EXTEND APPROX. 30m FURTHER TO MATCH TO EXISTING
TRANSPORT AND URBAN PLANNING
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411 Fax 02 9545 1556
www.transurbanplan.com.au
TAHMOOR COAL
Concept Design for proposed intersection improvements
Remembrance Drwy and Tahmoor Mine Access Rd, Tahmoor
PROPOSED INTERSECTION TREATMENT
FIGURE 10
A
SCALE: 1:500@A2



SIGNS AND LINEMARKING LAYOUT
SCALE 1:500

Rev.	Date	Description	Des.	Verif.	Appd.
5	10/02/2022	ISSUED FOR APPROVAL - 80% DETAILED DESIGN	MPR	AMC	SB
4	20/12/2021	ISSUED FOR APPROVAL - 80% DETAILED DESIGN	MPR	AMC	SB
3	7/12/2021	ISSUED FOR APPROVAL - 80% DETAILED DESIGN	MPR	AMC	SB
2	3/11/2021	PAVEMENT DESIGN UPDATED & GIVEWAY ADDED TO OLIVE LANE	MPR	AMC	SB
1	15/10/2021	ISSUED FOR INFORMATION - 20% DETAILED DESIGN	MPR		BA

SIMEC

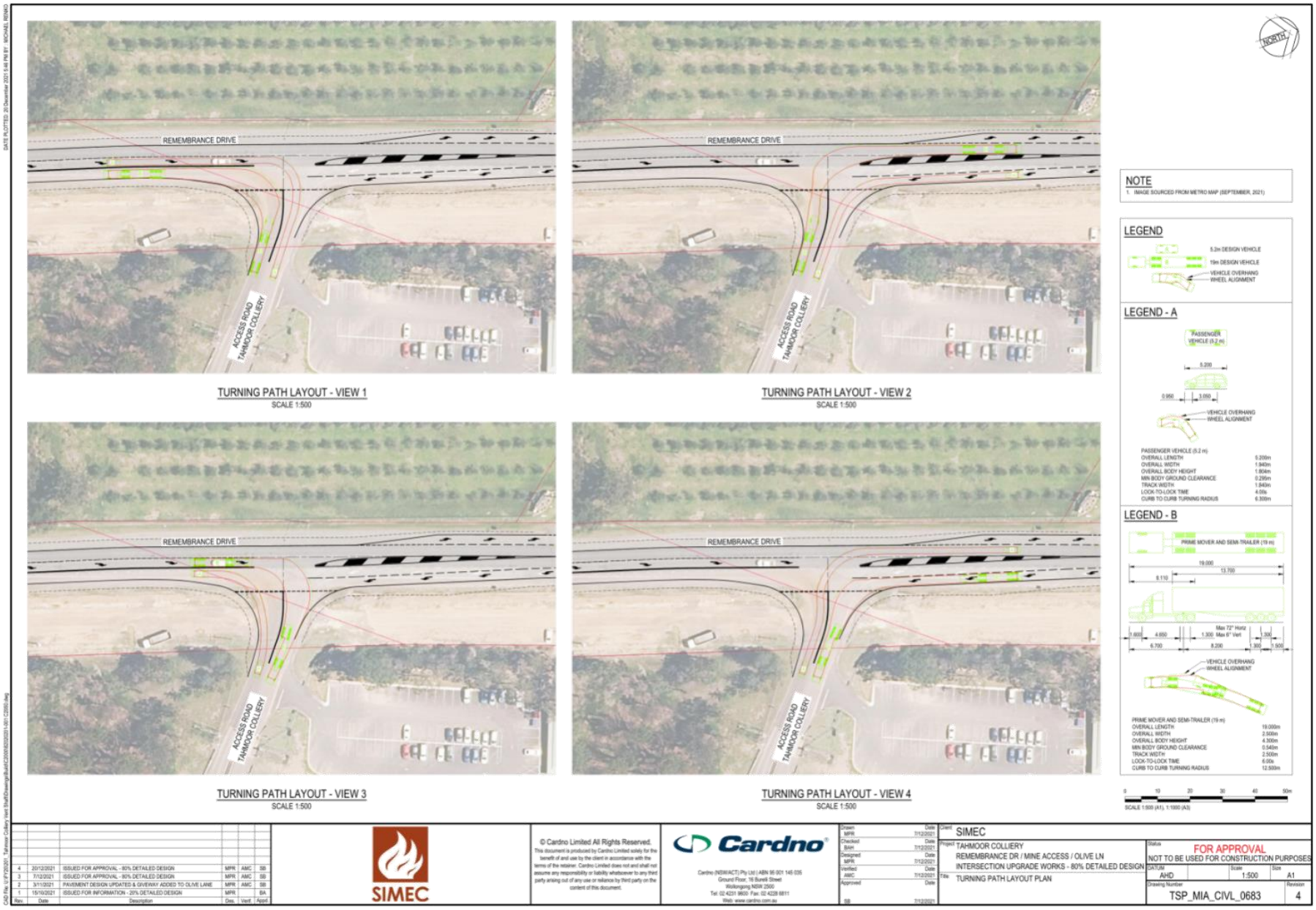
Cardno

Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035
Ground Floor, 16 Burelli Street
Wollongong NSW 2500
Tel: 02 4231 9900 Fax: 02 4228 6811
Web: www.cardno.com.au

	Date
Drawn MPR	7/12/2021
Checked BAH	7/12/2021
Designed MPR	7/12/2021
Verified AMC	7/12/2021
Approved SB	7/12/2021

Client: SIMEC
Project: TAHMOOR COLLIERY
REMEMBRANCE DR / MINE ACCESS / OLIVE LN
INTERSECTION UPGRADE WORKS - 80% DETAILED DESIGN
Title: SIGNS AND LINEMARKING LAYOUT PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: 1:500 | Size: A1
Drawing Number: TSP_MIA_CIVL_0682 | Revision: 5


REMEMBRANCE DRIVE
ACCESS ROAD TAHMOOR COLLIERY
TURNING PATH LAYOUT - VIEW 1
SCALE 1:500
TURNING PATH LAYOUT - VIEW 2
SCALE 1:500
TURNING PATH LAYOUT - VIEW 3
SCALE 1:500
TURNING PATH LAYOUT - VIEW 4
SCALE 1:500
NORTH
NOTE
1. IMAGE SOURCED FROM METRO MAP (SEPTEMBER, 2021)
LEGEND
8.2m DESIGN VEHICLE
19m DESIGN VEHICLE
VEHICLE OVERHANG
WHEEL ALIGNMENT
LEGEND - A
PASSENGER VEHICLE (8.2 m)
LEGEND - B
PRIME MOVER AND SEMI-TRAILER (19 m)
SCALE 1:500 (A1), 1:1000 (A3)
SIMEC
© Cardno Limited All Rights Reserved.
Cardno
SIMEC
TAHMOOR COLLIERY
REMEMBRANCE DR / MINE ACCESS / OLIVE LN
INTERSECTION UPGRADE WORKS - 80% DETAILED DESIGN
TURNING PATH LAYOUT PLAN
FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES
AHD
1:500
A1
TSP_MIA_CIVL_0683
4

Old Hume Highway/Mine Access/Olive Lane Intersection Upgrade

Road Safety Audit

Detailed Design Stage

22nd October 2021

JN22023_Report01 Rev02 - Cardno Tahmoor

On Behalf of

Cardno (NSW/ACT)

1503C/41-45 Belmore Street
Ryde, NSW, 2112

0405 345 124
admin@amwc-rsa.com
www.amwc-rsa.com
ABN 13 619 698 985

NSW RSA Register Details

Final Signoff Date	22/10/2021
Title of Audit	Old Hume Highway/Mine Access/Olive Lane Intersection Upgrade
Location of Audit	Bargo
Project Description *(max 300 char)*	The aim of this project is to design and construct the upgrade of the intersection at Old Hume Highway/Mine Access/Olive Lane in Bargo
Purpose of Audit *(max 300 char)*	The aim of this Road Safety Audit (RSA) is to assess the detailed design plans in the context of the existing conditions, and the interface between existing and proposed works
State of Audit	NSW
Stage of Audit	Detailed Design Stage
Client Company	Cardno (NSW/ACT)
Client Contact	Sam Barlow
Client Phone	0422 460 721
Client Email	samuel.barlow@cardno.com.au
Audit Team Lead	Aaron Walton
Audit Team Member	Mark Keech

Table of Contents

NSW RSA Register Details ii

1 **Project Description** 1

2 **Study Area** 1

3 **Auditable Data** 1

4 **Audit Stage** 2

5 **Exclusions** 2

6 **Audit Team** 2

7 **Audit Program** 2

8 **Audit Risk Assessment Technique** 3

9 **Audit Findings** 4

10 **Formal Statement** 14

1 Project Description

The aim of this project is to design and construct the upgrade of the intersection at Old Hume Highway/Mine Access/Olive Lane in Bargo, including pavement widening, pavement rehabilitation, line marking, signage and guideposts.

The aim of this Road Safety Audit (RSA) is to assess the detailed design plans in the context of the existing conditions, and the interface between existing and proposed works.

2 Study Area

The general audit location is shown below.

Source – Cardno (NSW/ACT)

3 Auditable Data

The following data was referenced during the audit:

> Tahmoor Colliery – Old Hume Hwy/ Mine Access/Olive LN – Intersection Upgrade Works – 20% Detailed Design (Rev 1 – 11/10/2021)

4 Audit Stage

A Detailed Design Stage Audit was carried out during a desktop assessment of the auditable data and a site visit of proposed works during day and night conditions. At the time of the site visit the weather was clear and traffic was light.

The audit was generally undertaken in accordance with 'TfNSW Guidelines for Road Safety Audit Practices (2011)' and 'Austroads: Guide to Road Safety Part 6 and Part 6a (2019)'.

5 Exclusions

At the time of the audit there were no exclusions presented to the audit team.

6 Audit Team

The audit team and client details are shown below.

Table 6-1 Audit Team & Client Details

Role	Name	
Client (Sponsor)	Cardno (NSW/ACT)	
Client Contact	Sam Barlow	Experienced Engineer
Client Email	samuel.barlow@cardno.com.au	
Lead Auditor	Aaron Walton	RSA-02-0501 - Level 3 Auditor
Lead Auditor Email	admin@amwc-rsa.com	
Team member	Mark Keech	RSA-02-0124 - Level 3 Auditor

7 Audit Program

The audit program details are shown below.

Table 7-1 Audit Program

Activity	Date	Attendees
Opening Meeting	01/10/2021	Aaron Walton, Boutros Abd
Site Inspection	06/10/2021	Aaron Walton, Mark Keech
Road Safety Audit	12/10/2021	Aaron Walton, Mark Keech
Draft Report Internal Review	13/10/2021	RSA Report (Rev00)
Draft Report External Responses	14/10/2021	RSA Report (Rev01)
Completion Meeting	22/10/2021	Aaron Walton, Sam Barlow
Final Report	22/10/2021	RSA Report (Rev02)

8 Audit Risk Assessment Technique

For each of the safety issues identified, the level of risk with each has been determined. The tables below are extracted from Austroads: Guide to Road Safety Part 6 and Part 6a (2019) and have been used in the assessment of risk for this audit.

Table 8-1 Incident Frequency

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Table 8-2 Incident Severity

Severity	Description	Examples
Catastrophic	Likely multiple deaths	> High-speed, multi-vehicle crash on freeway. > Car runs into crowded bus stop. > Bus and petrol tanker collide. > Collapse of bridge or tunnel.
Serious	Likely death or serious injury	> High or medium-speed vehicle/vehicle collision. > High or medium-speed collision with a fixed roadside object. > Pedestrian or cyclist struck by a car.
Minor	Likely minor injury	> Some low-speed vehicle collisions. > Cyclist falls from bicycle at low speed. > Left-turn rear-end crash in a slip lane.
Limited	Likely trivial injury or property damage only	> Some low-speed vehicle collisions. > Pedestrian walks into object (no head injury). > Car reverses into post.

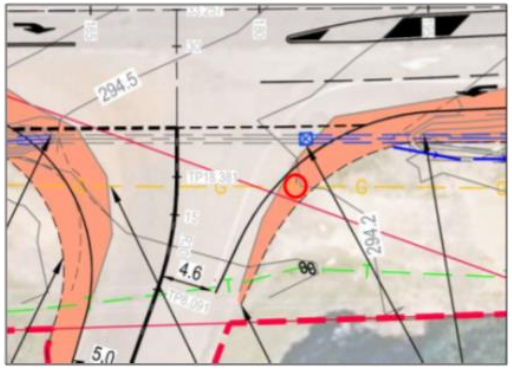
Table 8-3 Resulting Level of Risk Matrix

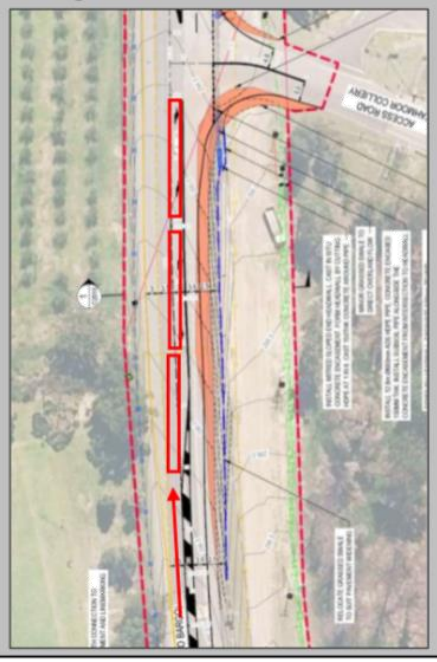
	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

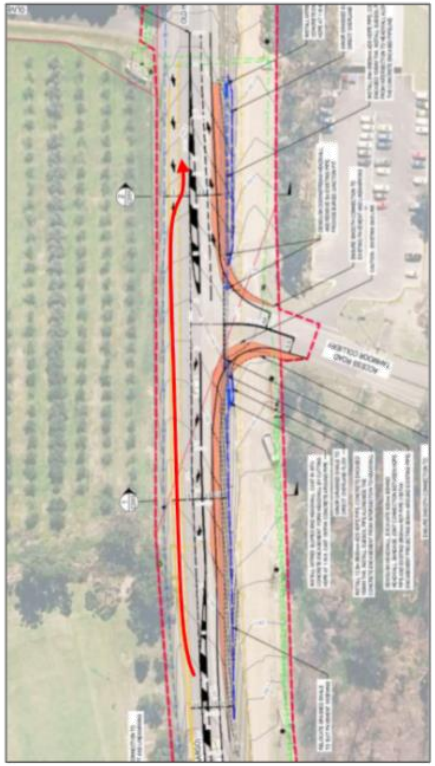
9 Audit Findings

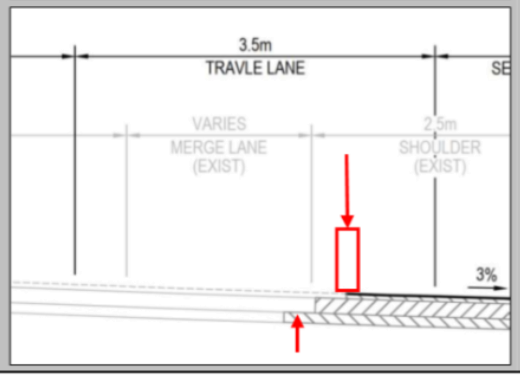
Table 9-1 Audit Findings

Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
1. Pavement Condition Extent of Works	There are large areas of existing pavement with minimal crossfall provided. The pavement is in poor condition and failing. There is a risk that a vehicle may become destabilised when impacting an area of damaged pavement resulting in loss of control and run-off road incidents. There is a risk that ponding water may damage the pavement surface creating destabilisation incidents resulting in run-off-road or head on collisions. This risk is increased for motorcyclists. There is a risk that the combination of flat longitudinal grades and flat cross falls may fail to drain pavement water resulting in aquaplaning incidents.  	Occasional	Serious	High	Pavement defects will be rectified as per pavement plans including heavy patching, crack sealing, deep life asphalt and AC overlay. Crossfall correction is out of scope for the project and existing crossfall is to be reinstated.

Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
2. Gas Main Riser Intersection of Mine Access	There is a gas main riser in the northern kerb return on the mine access, where pavement widening is proposed. There is a risk that construction may damage the gas main resulting in explosion. There is a risk that a turning vehicle may damage the gas main resulting in explosion.  	Occasional	Serious	High	Object is a gas main marker, not a riser. To be assessed and relocated on site to prevent nuisance impacts. If deemed necessary by Jemena, potholing of gas main will be completed during construction.

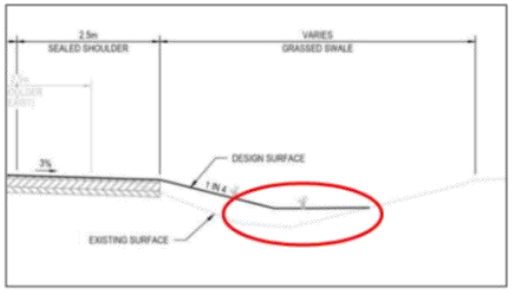
Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
3. Deceleration and Storage Length Right Turn into Mine Access	There appears to be insufficient deceleration and storage provided for the right turn bay into the Mine Access. There is a risk that a northbound vehicle may have insufficient distance to sight the intersection, enter the turning lane and decelerate to a stop before crossing in front of oncoming traffic resulting in side-impact or head-on collisions. There is a risk that a vehicle stopped and waiting in the right turn bay may further restrict the deceleration length and storage for a following vehicle, requiring deceleration and possible queuing in the through lanes resulting in rear-end collisions. 	Occasional	Serious	High	Turn treatment designed as per Austroads part 4A figure 7.7 urban CHR (s) treatment. D = 55 m. Traffic report indicates 3 heavy vehicles movement in and 3 movement outs per day. Likelihood of HV queueing is low.

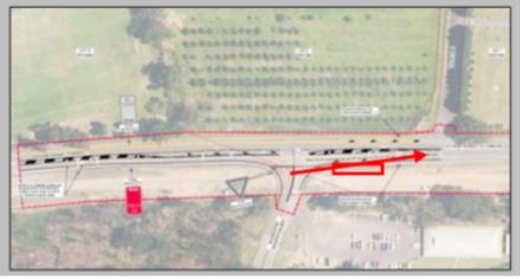
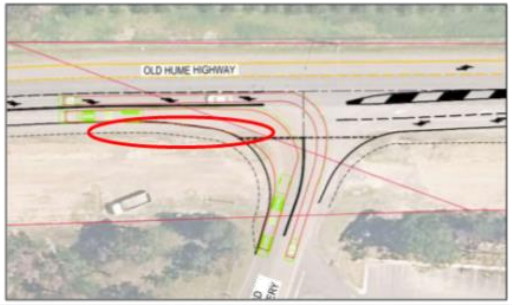
Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
4. Deceleration and Storage Length Left Turn into Olive Lane	There is excessive length provided for the left turn into Olive Lane. There is an excessive length of taper provided at the start of the left turn lane. There is a risk that a motorist may assume the left turn lane is an acceleration lane and attempt to pass slow vehicles, or a slow vehicle may enter the lane to allow other vehicles to pass, before the lane terminates suddenly resulting in run-off-road or side-swipe collisions. 	Occasional	Serious	High	80% design to further investigate and update the left turn into Olive Lane.

Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
5. Pavement Joint Extent of Works	There is a large number of different pavement types proposed within the extent of works. There are many pavement joints proposed in turning paths and wheel paths. Additionally, the pavement stepping shown on the typical sections shows undercutting of the existing pavement layer. There is a risk that pavement joints may fail in the wheel path, turning path or against multiple pavement treatments resulting in destabilisation incidents, run-off-road incidents or head on collisions.  	Occasional	Serious	High	Noted. Longitudinal joints in thick asphalt inlay treatments will be reviewed and aligned with lane line, median line or sump line locations. Longitudinal joints for pavement widening will be reviewed and aligned with lane lines or sump line locations, except at the start/finish of deceleration and acceleration lanes. Priority will be given to avoid longitudinal joints in wheel paths in through traffic lanes. The forward work plan includes resurfacing the full area of pavement works with a longitudinal surface joint associated with paver runs will be aligned with lane lines or located within medians. The stepped joint detail will be reversed as undercutting layers is not feasible.

Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
6. Delineation Olive Lane	There is insufficient delineation at Olive Lane including hold lines, centre lines, through lane lines and signage. There is a risk that a motorist on Olive Lane may encroach the through lane resulting in side impact collisions. There is a risk that a motorist turning right out of Olive Lane may not observe lane discipline and restrict the space available for traffic turning in resulting in sideswipe or head-on collisions. There is a risk, particularly at night or during adverse weather, that a motorist may not sight the intersection configuration, hold line or lane discipline resulting in sideswipe, head-on or side-impact collisions.  	Improbable	Serious	Medium	Line marking is to be undertaken at the intersection, including new hold line and give way sign. This will be updated at 80%.

Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
7. Delineation Extent of Works	The proposed delineation does not match the extents of the pavement works. Additionally, there is insufficient information provided to the audit team of the proposed line marking types used, particularly under the master control line. There is a risk that insufficient or missing delineation may not provide adequate guidance to motorists resulting in run-off-road incidents, head-on collisions or side swipe collisions. 	Improbable	Serious	Medium	Line marking plan has now been extended to match extent of pavement works.

Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
8. Drainage Capacity Extent of Works	It is unclear to the audit team of the capacity and flow of the proposed drainage channel, as the typical section is showing a reduction in width of the existing channel and the invert level is being raised. There is a risk that water may overtop the drain and flow into the travel lane resulting in aquaplaning incidents. There is a risk that ponding water may damage the pavement surface creating vehicle/motorcycle destabilisation incidents resulting in run-off-road or head-on collisions. There is a risk that water flows may erode the edge of the pavement resulting in vehicle snag/roll incidents.  	Improbable	Serious	Medium	Channel has capacity to convey the 10yr ARI (Design Storm) event. Velocities in the channel are within acceptable limits for vegetated swales. There is sufficient longitudinal gradient to reduce risk of ponding. Regrading of the channel will provide opportunity to rehabilitate roadside embankment that in turn will reduce risk of scour along the channel within the extent of works.

Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
9. Parking Restriction Extents Extent of Works	There is limited information provided to motorists regarding potential parking restrictions. Within 264m of proposed works there are only 2 parking restriction signs provided for both directions of travel for existing and proposed. There is a risk that a motorist may stop/park in a position that restricts sight or travel lane width resulting in rear-end, side-swipe or side-impact collisions. 	Improbable	Minor	Low	Additional signage is now proposed on the northern extent of work near Olive Lane.
10. Line Marking Turning Path Layout – View 1	There are design vehicles shown tracking over line marking. There is a risk that a vehicle regularly tracking over line marking may damage the line marking, decreasing the visibility of the through road alignment and intersection delineation, increasing the risk of run-off-road, head-on, side-impact, and rear-end collisions. 	Improbable	Minor	Low	80% plans will have slightly increased widening and updated line marking to avoid turning paths.

Item Location	Safety Hazard Finding	Frequency	Severity	Level Of Risk	Project Manager Response
11. Lighting Olive Lane	There is no lighting provided at Olive Lane. There is a risk at night or during adverse weather conditions that a through motorist may not sight a vehicle exiting the intersection resulting in run-off road, rear-end, side impact or pedestrian-vehicle collisions. This risk is increased by the lighting and delineation provided at the Mine Access, which may reduce the visibility of the intersection at Olive Lane. 	Improbable	Minor	Low	Lighting assessment and requirements of Olive Lane is outside of the scope of works for this project. Delineation at this intersection to be upgraded. Intersection lighting will be as per current arrangements. Council, as asset owner to be informed of this existing condition finding.

10 Formal Statement

We, the undersigned, declare that we have reviewed the site and data listed in this report and identified the safety and operational deficiencies above.

It should be noted that while every effort has been made to identify potential safety hazards, no guarantee could be made that every deficiency has been identified.

A project sponsor is under no obligation to accept the findings outlined in this audit report. This report simply provides the opportunity to review potential safety issues highlighted by the auditors.

This audit will be recorded on the NSW Register of Road Safety Auditors and the project sponsor should expect email notification from the register to confirm the audit has been carried out.

We recommend that points of concern be investigated, and necessary corrective actions undertaken.

Aaron Walton
Level 3 Road Safety Auditor
Team Leader

Mark Keech
Level 3 Road Safety Auditor
Team Member

TRAFFIC IMPACT ASSESSMENT

FOR

TAHMOOR SOUTH

PROJECT

Ref. 18156r
Final Report
19 November 2018

Prepared By

TRANSPORT & URBAN PLANNING PTY LTD
Traffic Engineering, Transport Planning
Road Safety & Project Management Consultants
5/90 Toronto Parade
P.O. Box 533
SUTHERLAND NSW 2232
Tel: (02) 9545-1411
Fax: (02) 9545-1556
Email: terry@transurbanplan.com.au

CONTENTS

EXECUTIVE SUMMARY

1.0 INTRODUCTION **1**

1.1 Background 1
1.2 Authority Requirements 1
1.3 Structure of this Report 2

2.0 EXISTING TAHMOOR MINE OPERATION AND PROPOSED PROJECT **3**

2.1 Existing Tahmoor Mine Operation 3
2.2 The Proposed Development 3

3.0 EXISTING AND FUTURE CONDITIONS **6**

3.1 Principal Road Network 6
3.2 Description of Existing Roads and Intersections 6
3.2.1 Remembrance Driveway 6
3.2.2 Hume Highway 7
3.2.3 Avon Dam Road 7
3.2.4 Tahmoor Mine Access Road and Other Local Roads 7
3.3 Existing Traffic Conditions on the Road Network 8
3.3.1 Existing Traffic Volumes 8
3.3.2 Daily Volumes on Road Network 8
3.3.3 Daily Volumes Generated by Tahmoor Mine 11
3.3.4 Weekday AM and PM Peak Hour Traffic Volumes 12
3.4 Road Safety 13
3.4.1 Remembrance Driveway 13
3.4.2 Avon Dam Road between Hume Highway at Pheasant Nest and Remembrance Driveway at Bargo 14
3.5 Bus Routes 14

4.0 ASSESSMENT OF TRAFFIC IMPACTS OF PROJECT **15**

4.1 Improvements to Remembrance Driveway/Tahmoor Mine Access Road Intersection 15
4.2 Traffic Generation in Operational Phase from Tahmoor Mine 15
4.3 Other Construction Traffic 17
4.3.1 Additional Facilities within Tahmoor Mine Compound 17
4.3.2 Construction of Vent Shafts 17
4.4 Traffic Impacts During Operational Phase 17
4.6 Construction Traffic Impacts 27
4.6.1 Associated Surface Infrastructure 27
4.6.2 Vent Shafts 28
4.6.3 Increase in Heavy Vehicles 28
4.7 Road Safety 29
4.8 Parking Changes 30

5.0 CONCLUSIONS **31**

1.5 PROPOSED ACCESS - VENTILATION SHAFT AND ACCESS PROJECT AT 345 MENANGLE ROAD, MENANGLE

File Number: 10623#229

EXECUTIVE SUMMARY

The report is for the Committee to discuss and consider the proposal by South32 Illawarra Metallurgical Coal (South32) to construct a site entrance intersection into 345 Menangle Road, Menangle.

The intersection will accommodate the construction and ongoing operational phase of a proposed ventilation shaft project. It is expected that the construction phase will need to accommodate vehicles up to a 19m semi-trailer. The operational phase is expected to accommodate light vehicles with the occasional heavy vehicle delivery of up to 19m semi-trailer.

A traffic report prepared on behalf of South32 to support the development application has determined that the intersection should consist of a channalised right turn of approximately 175m, an auxiliary left turn lane of approximately 125m and acceleration lane, for south bound vehicles exiting the site of approximately 195m. Internal works will include construction of a divided entry and exit point with Stop treatment.

He project would include pavement and shoulder widening on the southern side of Menangle Road, adjacent to the ventilation shaft site, and associated new signs and line markings. The proposed access aims improve site distance along Menangle Road and to the proposed intersection and facilitate safer turning manoeuvres without impacting the through traffic on this section of Menangle Road, Menangle.

Council notes that permission for construction of the proposed intersection would only be granted subject to a successful development consent for the site, which is currently being determined.

South32 is seeking Local Traffic Committee's support for the proposal.

RECOMMENDATION

That the Local Traffic Committee:

1. Endorse the proposed site entry intersection concept design Proposal including delineation and signage.
2. Endorse the installation of the Stop sign (R1-1) controls and line markings for the intersection as shown in the attached plan of this report.

REPORT

Council has received a Road Management application (Road Opening application) from South32 Illawarra Metallurgical Coal (South32) for the construction of a proposed site entrance intersection on Menangle Road, Menangle. The intersection will include a channalised right turn treatment of approximately 175m, an auxiliary left turn lane of approximately 125m and acceleration lane, for south bound vehicles exiting the site of approximately 195m.

Internal works will include construction of a divided entry and exit point and associated Stop (R1-1) treatment.

Additional design elements include realignment of the existing north bound lane to improve site distance to the proposed intersection and permit upgraded road side drainage and verge. The exiting curve radius is to be maintained and will provide improved sight distance. A length of W-beam safety barrier will be constructed adjacent to the north bound travel lane.

The works on the southern side of Menangle Road will include the creation of left turn lane, acceleration lane and a realigned south bound traffic lane. Road embankment for the widening will encroach onto private land, being 345 Menangle Road, Menangle. Road reserve in this area will be widened and land dedicated as public road. Road wearing surface will include asphalt upgrade.

South32 is seeking support of the implementation of the above works.

Consultation

South32 has submitted a Development Application to the NSW Government for the ventilation shaft project. Assessment of the Development includes the review of traffic impacts and comments from Council on the proposal.

This proposal has not been raised and discussed in the Community Forum, however the public have been given the opportunity to comment on the proposal during the development assessment process.

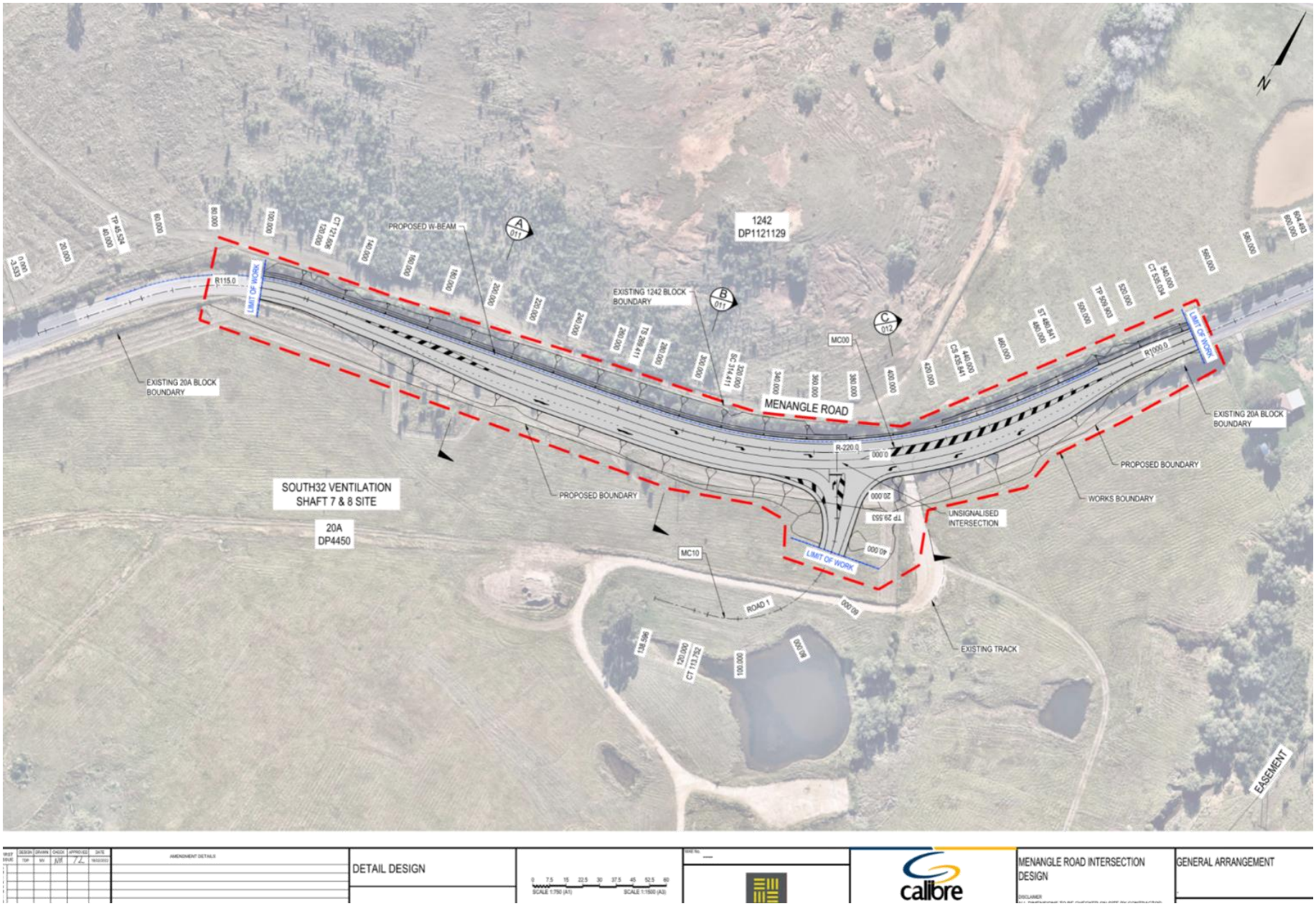
South32 have had lengthy consultation with Assets Transport and Engineering section of Council in the development of this intersection design.

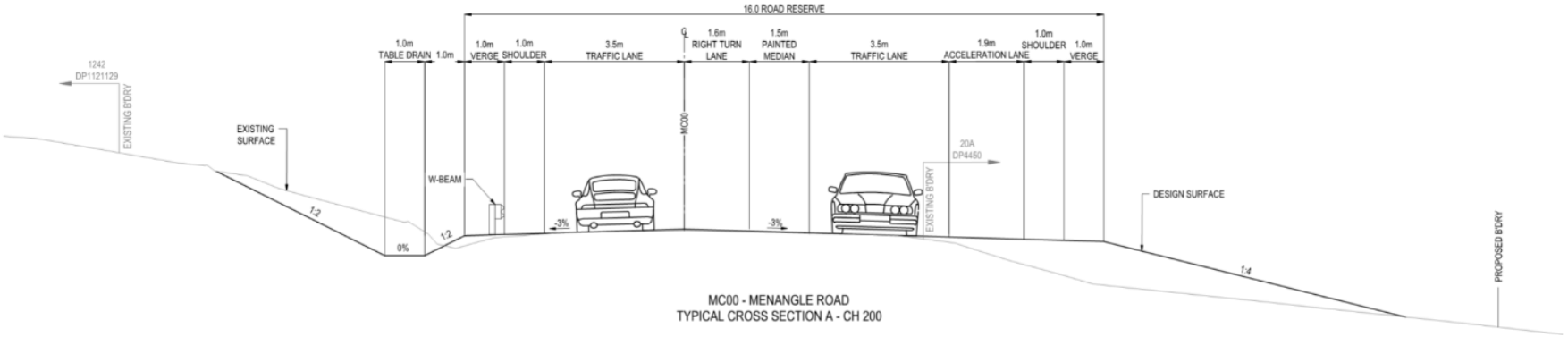
Financial Implications

This matter has no financial impact on Council's adopted budget or forward estimates as the proposal will be fully funded by South32.

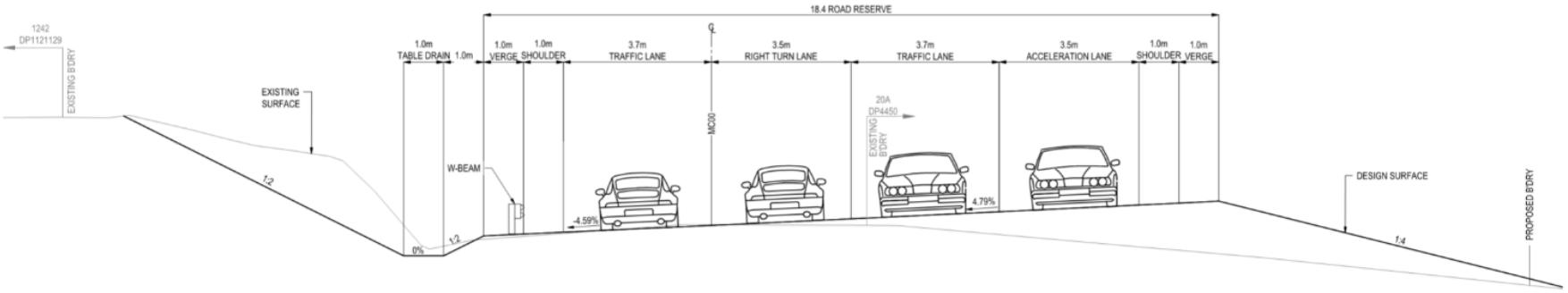
ATTACHMENTS

1. Menangle Road Intersection Design
2. Traffic Assessment Report


1242
DP1121129
PROPOSED W-BEAM
EXISTING 1242 BLOCK BOUNDARY
EXISTING 20A BLOCK BOUNDARY
LIMIT OF WORK
MENANGLE ROAD
SOUTH32 VENTILATION SHAFT 7 & 8 SITE
20A
DP4450
PROPOSED BOUNDARY
WORKS BOUNDARY
UNSIGNALISED INTERSECTION
ROAD 1
EXISTING TRACK
EASEMENT
MC00
MC10
R115.0
R-220.0
R1000.0
DETAIL DESIGN
MENANGLE ROAD INTERSECTION DESIGN
GENERAL ARRANGEMENT
callibre



MC00 - MENANGLE ROAD
TYPICAL CROSS SECTION A - CH 200



MC00 - MENANGLE ROAD
TYPICAL CROSS SECTION B - CH 300

Plot Date: 16-Feb-22, 9:37 AM File: H:\21\21-000489\6_Model\Civil\3D\21-000489-011.dwg User:Mehul Vaidya

FIRST ISSUE	DESIGN	DRAWN	CHECK	APPROVED	DATE	AMENDMENT DETAILS	
	TSP	MV	MR	JL	16/02/2022		

DETAIL DESIGN

SCALE 1:50 (A1) SCALE 1:100 (A3)

ISSUE No. ----

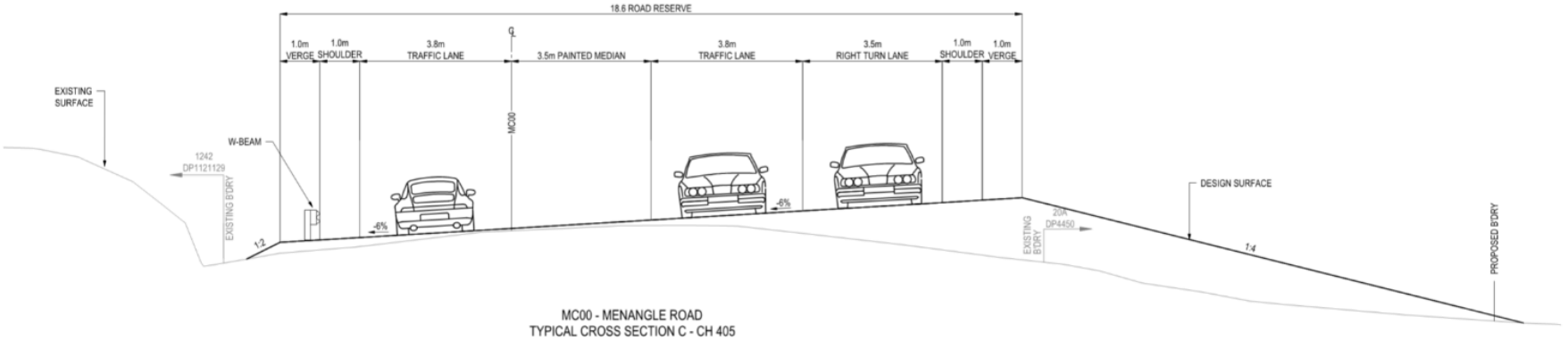
calibre
calibregroup.com

MENANGLE ROAD INTERSECTION DESIGN

DISCLAIMER
ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.

TYPICAL CROSS SECTIONS

21-000489 011 ----



MC00 - MENANGLE ROAD
TYPICAL CROSS SECTION C - CH 405

Plot Date: 16-Feb-22, 9:57 AM File: H:\21\21-000489\6_Model\Civil\3D\21-000489-011.dwg User:Tim De Pult

FIRST ISSUE	DESIGN	DRAWN	CHECK	APPROVED	DATE
	TDP	MY	MR	TZ	16/02/2022

AMENDMENT DETAILS

DETAIL DESIGN

SCALE 1:50 (A1) SCALE 1:100 (A3)

BASE No. ----

SOUTH32

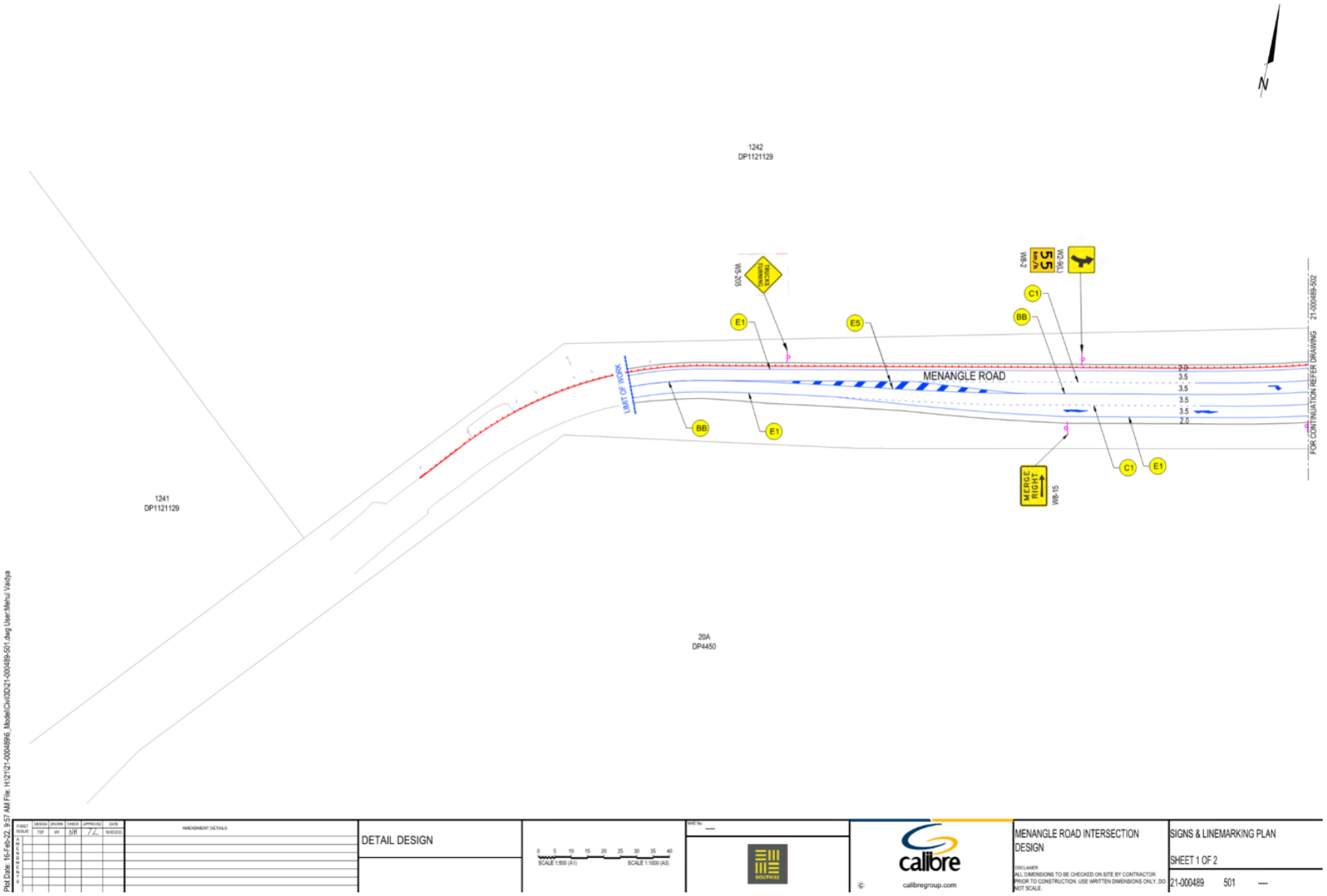
© callibregroup.com

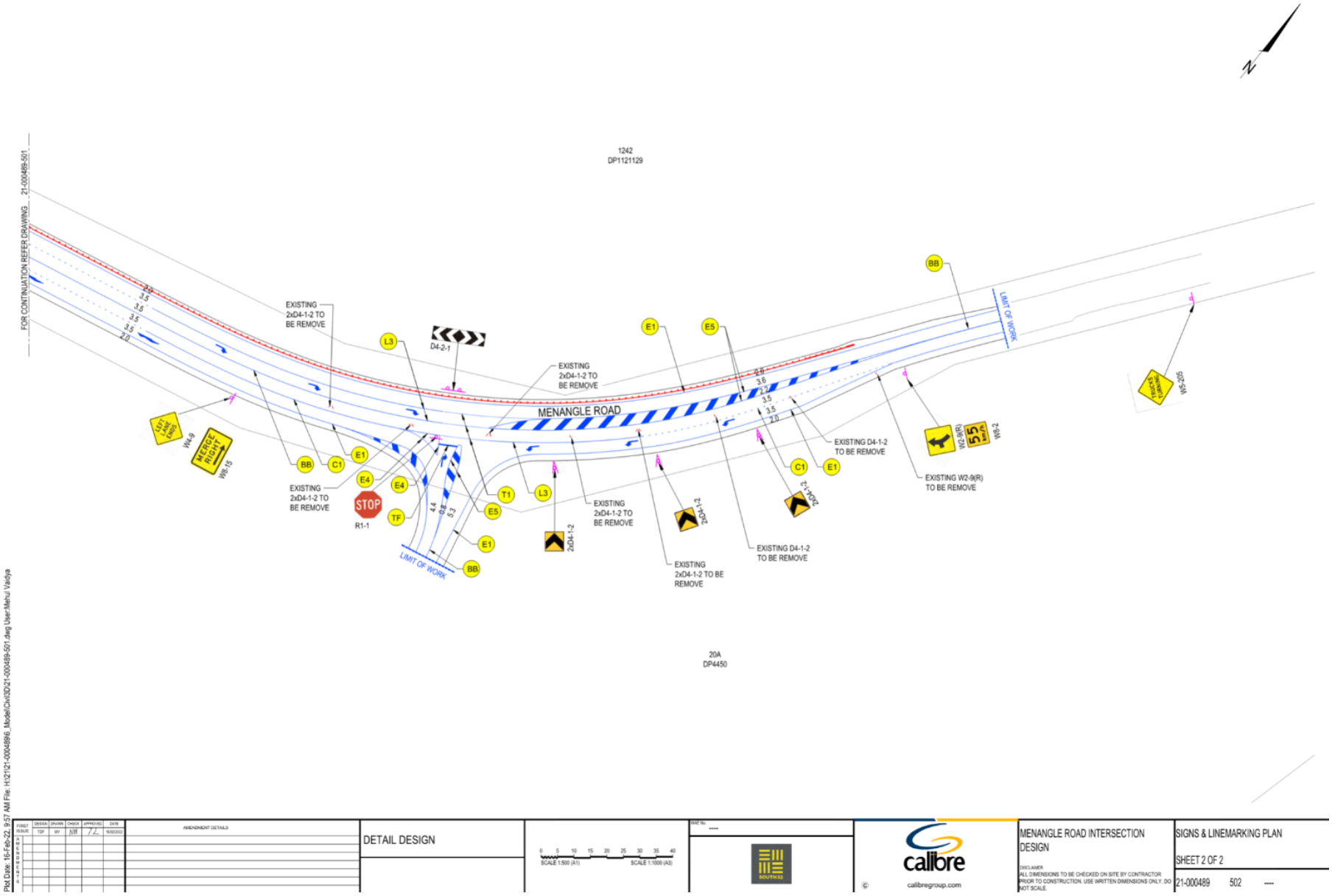
MENANGLE ROAD INTERSECTION DESIGN

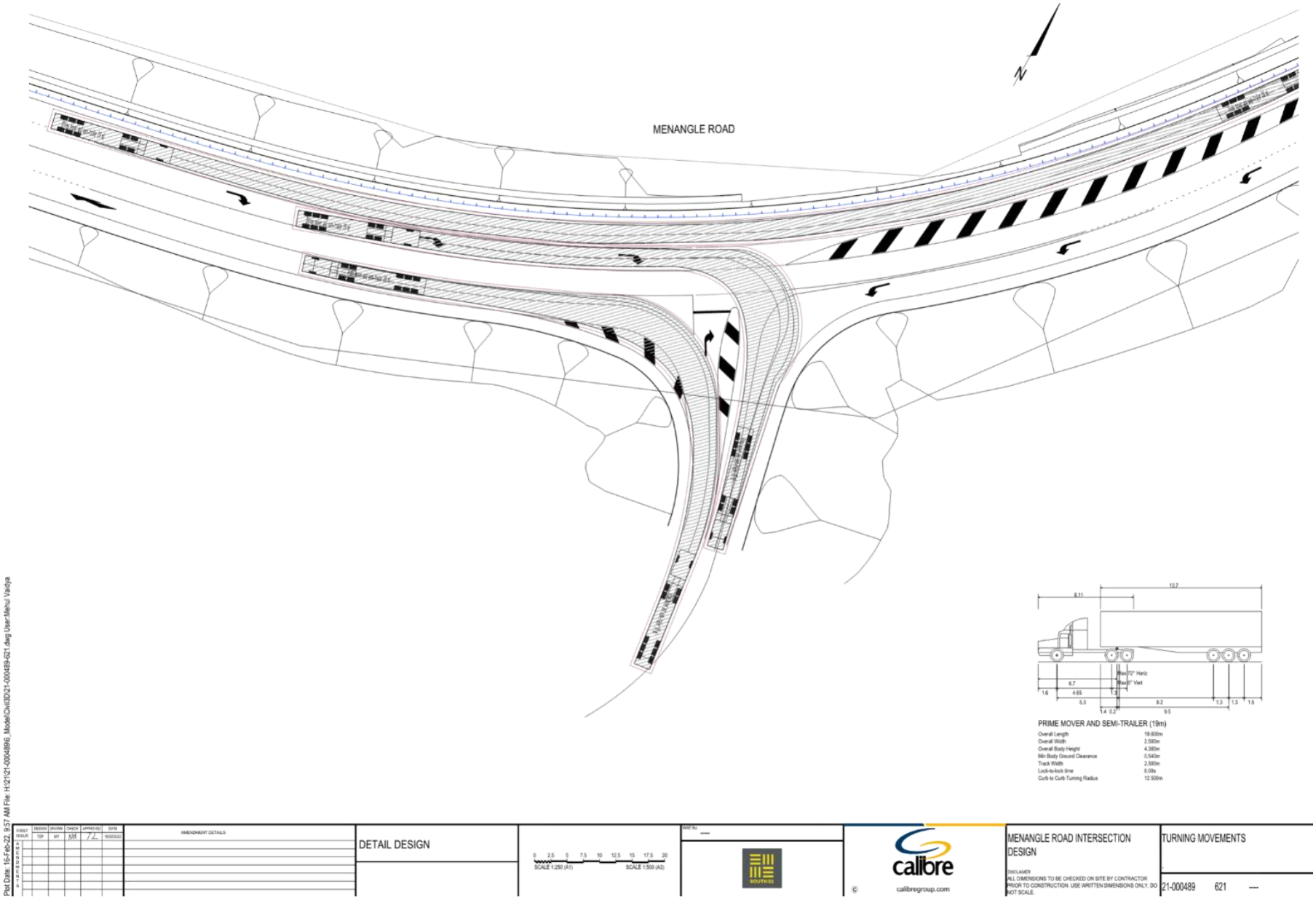
DISCLAIMER
ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.

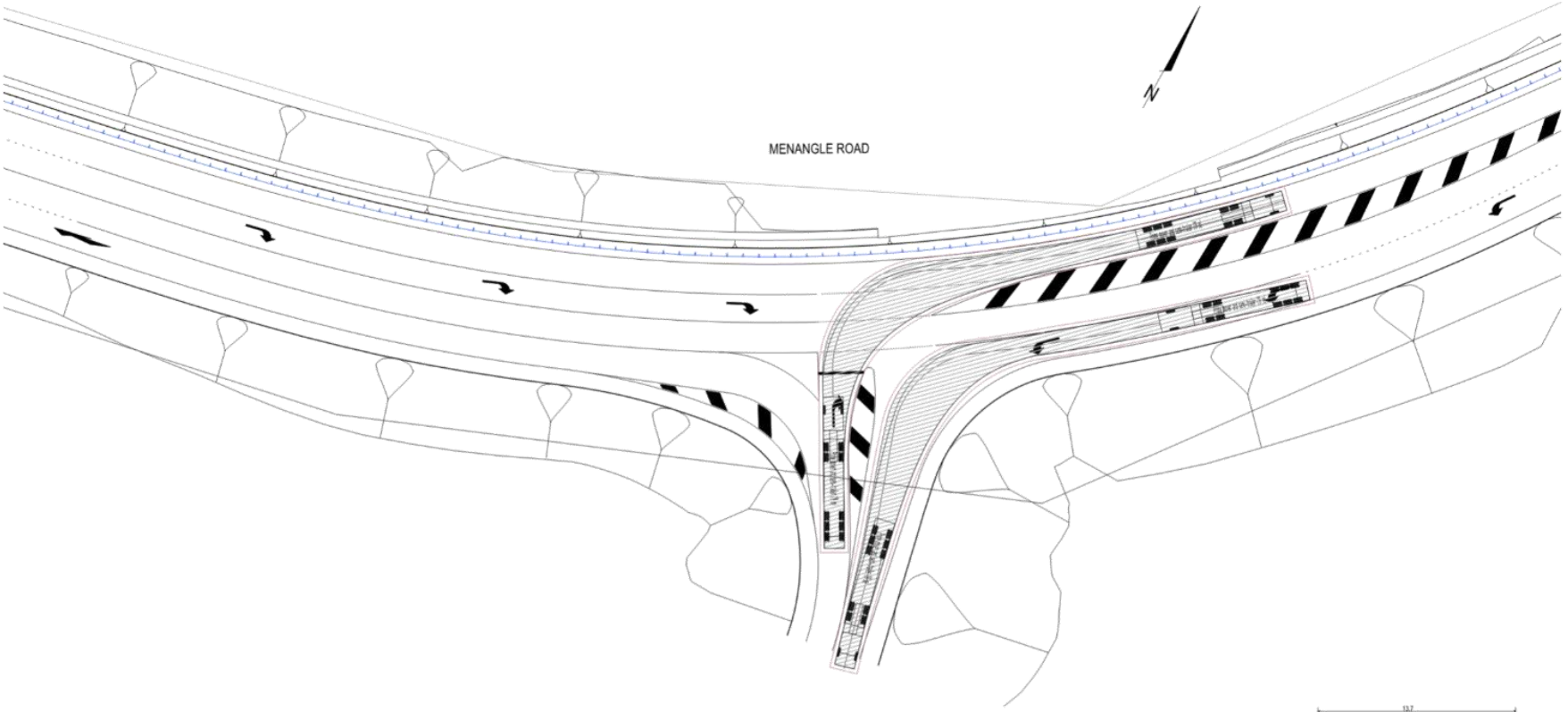
TYPICAL CROSS SECTIONS

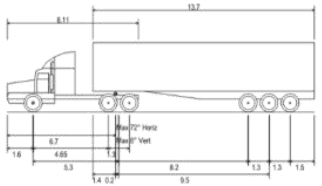
21-000489 012 ----


N
1242
DP1121129
1241
DP1121129
20A
DP4450
MENANGLE ROAD
LIMIT OF WORK
W6-205
TUNNEL
W8-2
W3-4D(L)
55
km/h
E1
E5
C1
BB
E1
BB
C1
E1
2.0
3.5
3.5
3.5
3.5
2.0
MERGE RIGHT
W8-15
FOR CONTINUATION REFER DRAWING 21-000489-502
DETAIL DESIGN
SCALE 1:500 (A1)
SCALE 1:1000 (A3)
SOUTH32
calibre
calibregroup.com
MENANGLE ROAD INTERSECTION DESIGN
SIGNS & LINEMARKING PLAN
SHEET 1 OF 2
21-000489 501 ----
Plot Date: 16-Feb-22, 9:57 AM File: H:\21\21-0004896_Model\Civil\3D\21-000489-501.dwg User:Mehul Vaidya


FOR CONTINUATION REFER DRAWING 21-000489-501
1242
DP1121129
MENANGLE ROAD
EXISTING 2xD4-1-2 TO BE REMOVE
EXISTING D4-1-2 TO BE REMOVE
EXISTING W2-9(R) TO BE REMOVE
LIMIT OF WORK
STOP
R1-1
D4-2-1
W4-9
W8-15
W5-205
W2-9(R)
55 km/h
W5-2
2xD4-1-2
20A
DP4450
DETAIL DESIGN
SCALE 1:500 (A1)
SCALE 1:1000 (A3)
calibre
calibregroup.com
MENANGLE ROAD INTERSECTION DESIGN
SIGNS & LINEMARKING PLAN
SHEET 2 OF 2
21-000489 502 ----


MENANGLE ROAD
PRIME MOVER AND SEMI-TRAILER (19m)
Overall Length 19.000m
Overall Width 2.500m
Overall Body Height 4.300m
Min Body Ground Clearance 0.540m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m
DETAIL DESIGN
SCALE 1:250 (A1)
SCALE 1:500 (A3)
calibre
calibregroup.com
MENANGLE ROAD INTERSECTION DESIGN
TURNING MOVEMENTS
21-000489 621 ----





PRIME MOVER AND SEMI-TRAILER (19m)

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

Plot Date: 16-Feb-22, 9:57 AM File: H:\21\21-000489\6_Model\Civil\3D\21-000489-621.dwg User:Mahul Vaidya

ISSUE	DESIGN	DRAWN	CHECK	APPROVED	DATE
A	TSP	MV	MR	TZ	16/02/2022

AMENDMENT DETAILS

DETAIL DESIGN

SCALE 1:250 (A1) SCALE 1:500 (A3)

SHEET No. ----

SOUTH 32

calibre

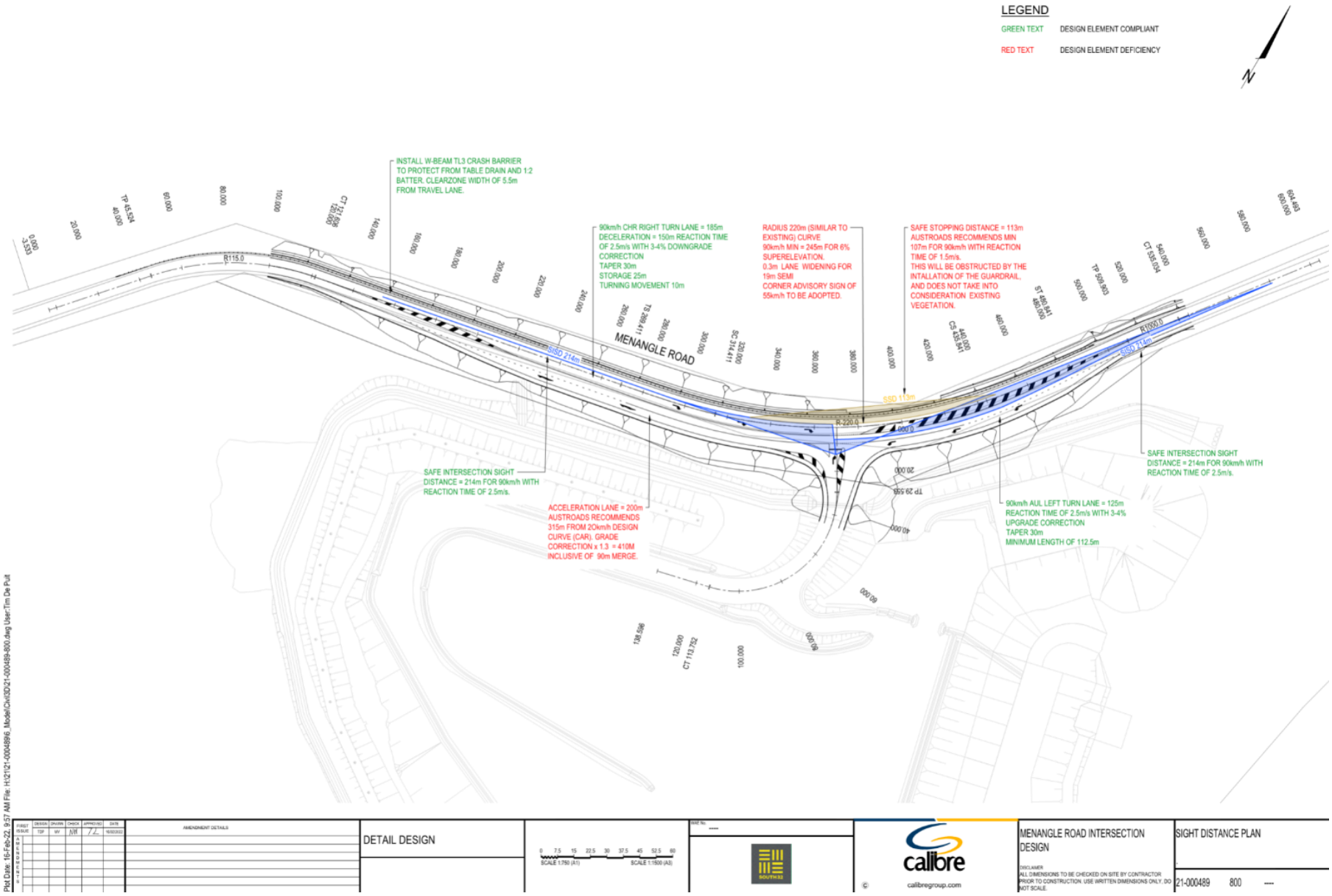
calibregroup.com

MENANGLE ROAD INTERSECTION DESIGN

DISCLAIMER
ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.

TURNING MOVEMENTS

21-000489 622 ----


LEGEND
GREEN TEXT DESIGN ELEMENT COMPLIANT
RED TEXT DESIGN ELEMENT DEFICIENCY
INSTALL W-BEAM TL3 CRASH BARRIER TO PROTECT FROM TABLE DRAIN AND 1:2 BATTER. CLEARZONE WIDTH OF 5.5m FROM TRAVEL LANE.
90km/h CHR RIGHT TURN LANE = 185m DECELERATION = 150m REACTION TIME OF 2.5m/s WITH 3-4% DOWNGRADE CORRECTION TAPER 30m STORAGE 25m TURNING MOVEMENT 10m
RADIUS 220m (SIMILAR TO EXISTING) CURVE 90km/h MIN = 245m FOR 6% SUPERELEVATION. 0.3m LANE WIDENING FOR 19m SEMI CORNER ADVISORY SIGN OF 55km/h TO BE ADOPTED.
SAFE STOPPING DISTANCE = 113m AUSTROADS RECOMMENDS MIN 107m FOR 90km/h WITH REACTION TIME OF 1.5m/s. THIS WILL BE OBSTRUCTED BY THE INTALLATION OF THE GUARDRAIL, AND DOES NOT TAKE INTO CONSIDERATION EXISTING VEGETATION.
MENANGLE ROAD
SSD 214m
SSD 113m
SSD 214m
SAFE INTERSECTION SIGHT DISTANCE = 214m FOR 90km/h WITH REACTION TIME OF 2.5m/s.
ACCELERATION LANE = 200m AUSTROADS RECOMMENDS 315m FROM 20km/h DESIGN CURVE (CAR). GRADE CORRECTION x 1.3 = 410M INCLUSIVE OF 90m MERGE.
SAFE INTERSECTION SIGHT DISTANCE = 214m FOR 90km/h WITH REACTION TIME OF 2.5m/s.
90km/h AUL LEFT TURN LANE = 125m REACTION TIME OF 2.5m/s WITH 3-4% UPGRADE CORRECTION TAPER 30m MINIMUM LENGTH OF 112.5m
DETAIL DESIGN
MENANGLE ROAD INTERSECTION DESIGN
SIGHT DISTANCE PLAN
21-000489 800 ----
callibre
callibregroup.com

APPENDIX D

Traffic Assessment Report

South32 Illawarra Metallurgical Coal
APPIN MINE VENTILATION AND ACCESS PROJECT

MENANGLE

TRAFFIC ASSESSMENT

REPORT

Ref. 20087r2
Assessment

31 May 2021

Prepared By

TRANSPORT & URBAN PLANNING PTY LTD
Traffic Engineering, Transport Planning
Road Safety & Project Management Consultants
5/90 Toronto Parade
P.O. Box 533
SUTHERLAND NSW 2232
Tel: (02) 9545-1411
Email: terry@transurbanplan.com.au

CONTENTS

EXECUTIVE SUMMARY

1.0 INTRODUCTION **1**
1.1 Overview and Background 1
1.2 Structure of Report and Standards Used in Assessment 1

2.0 PROJECT **2**
2.1 Existing Operations 2
2.2 Proposed Modification 2
2.2.1 Project Area (the Site) 2
2.2.2 Appin Mine Ventilation and Mine Access Project (the Project) 3
2.2.3 Timing 4
2.2.4 Construction Phase 5
2.2.5 Operational Phase 6
2.2.6 Transport Routes 7
2.2.7 Proposed Intersection Upgrade Works and Car Parking 7

3.0 EXISTING CONDITIONS **8**
3.1 Road Network 8
3.2 Existing Traffic Conditions 9
3.2.1 Daily Volumes and Vehicle Classifications 9
3.2.2 Intersection Traffic Volumes in AM and PM Peak Periods 10
3.3 Pedestrians 11
3.4 Bicycles 11
3.5 Bus Routes 11

4.0 ASSESSMENT OF TRAFFIC IMPACTS OF PROPOSAL **12**
4.1 Proposed Access 12
4.2 Traffic Generation During Operational Phase 12
4.3 Assessment of Traffic Impacts 13
4.4 Cumulative Impacts 17
4.5 Construction Impacts 19
4.6 Parking and Internal Roads 19
4.7 Pedestrians and Cyclists and Public Transport 20
4.8 Road Safety 20

5.0 CONCLUSIONS **21**

ILLUSTRATIONS

Figure 1 Location
Figure 2 Site
Figure 3A Project
Figure 3B Indicative Site Entrance Arrangement on Menangle Road
Figure 4 Transport Routes
Figure 5 Existing Traffic Controls
Figure 6 Weekday and Daily Volumes
Figure 7 Existing AM Site Peak Hour Traffic Volumes
Figure 8 Existing PM Site Peak Hour Traffic Volumes
Figure 9 Additional Traffic from the Project in the AM Site Peak Hour
Figure 10 Additional Traffic from the Project in the PM Site Peak Hour

APPENDICES

Appendix 1 SIDRA Modelling Extracts

EXECUTIVE SUMMARY

1. *This report documents the traffic impacts for the Appin Mine Ventilation and Access Project on Menangle Road, Menangle.*

2. *The Project involves the construction and operation of Ventilation Shafts 7 and 8, together with mine access facilities and associated infrastructure, including car parking and access roads.*

3. *As part of the Project a new Site Entrance intersection will be constructed on Menangle Road north of Finns Road. The intersection will include a left turn auxiliary lane and a right turn bay (CHR treatment) on Menangle Road for left and right turns into the Site. The intersection will be designed and constructed to Austroads Standards.*

4. *Once operational in 2025 the worst case day from a traffic perspective would be when a workforce of up to 308 people will access the Site on a maintenance weekday (1 day per week) over 3 shifts. A significant proportion of this workforce will be existing employees/contractors who currently access the mine via a different mine access facility.*

5. *Heavy vehicles associated with deliveries and maintenance in the operational phase are expected to number 12 trucks per day (i.e. 12 in/12 out) and will typically be rigid trucks and 19 metre articulated vehicles.*

6. *The assessment of the traffic impacts, including the cumulative impacts in the operational phase, has found that the traffic impacts will be satisfactory, with the Site Entrance intersection as well as the adjacent intersections on the road network all operating at a good level of service, with the Project in place.*

7. *The Project will have sufficient car parking to accommodate employees and visitors including at shift change over times.*

8. *The internal roads and car parking will be designed and constructed to AS2890.1, AS2890.2 and AS2890.6 standards as appropriate.*

9. *Construction is expected to commence in July 2022 with the ventilation shafts completed by June 2024. Construction of the mine access infrastructure will take an additional 6-12 months and is planned to commence July 2024.*

10. *Following approval, South32 Illawarra Metallurgical Coal will prepare relevant environmental management plans including a Traffic Management Plan to manage the impacts of the construction of site infrastructure, including the construction of the Site Access Intersection.*

11. *The Project is not expected to have any negative impacts on other road users including pedestrians, cyclists and public transport vehicles (buses) and/or on road safety.*

GLOSSARY

ADT	-	Average Daily Volume (7 day average)
AWT	-	Average Weekday Volume (5 day average)
AUL	-	Auxiliary left turn lane treatment
AUR	-	Auxiliary right turn lane treatment
AVD	-	Average vehicle delay per vehicle in seconds
BAL	-	Basic left turn treatment
BAR	-	Basic right turn treatment
CHR	-	Channelised right treatment/lane
DPIE	-	Department of Planning, Industry and Environment
DS	-	Degree of Saturation, a measure of intersection performance based on the ratio of demand flow to capacity
HMD	-	Highest Movement Delay per Vehicle in Seconds
Light Vehicles	-	Austroads 1 and 2 vehicle classifications and motorbikes
LS	-	Level of Service, a measure of intersection performance based on vehicle delay. There are six levels of service from A to F, where Level of Service A represents very good conditions and spare capacity and Level of Service F represents oversaturated conditions.
Heavy Vehicles	-	Austroads 3-12 vehicle classifications
SIDRA	-	SIDRA Intersection Traffic Model
TfNSW	-	Transport for NSW (previously Roads and Maritime Services NSW)
vpd	-	Vehicles per day
vph	-	Vehicles per hour
95^{th}% queue	-	95^{th} percentile queue length in metres

1.0 INTRODUCTION

1.1 Overview and Background

The Appin Mine (the Mine) is an existing underground coal mine situated in the Southern Coalfield of New South Wales (NSW) approximately 25 kilometres north-west of Wollongong. The Mine is owned and operated by Endeavour Coal Pty Ltd, a subsidiary of Illawarra Coal Holdings Pty Ltd, which is a wholly owned subsidiary of South32 Limited. Appin Mine, Cordeaux Colliery and Dendrobium Mine (and associated facilities) collectively operate as South32 Illawarra Metallurgical Coal (IMC).

IMC received Project Approval 08_0150 (the Appin Mine approval) from the Planning Assessment Commission of NSW under delegation of the Minister for Planning and Infrastructure on 22 December 2011 for current and proposed mining of the Bulli Seam Operations (BSO). The Appin Mine approval was gazetted as a State Significant Development for the purposes of future modifications on 23 November 2018.

IMC is seeking to modify the existing Appin Mine approval, pursuant to Section 4.55(2) of the NSW *Environment Planning and Assessment Act 1979* (EP&A Act), to incorporate the construction and operation of infrastructure critical to the ongoing viability of the Mine referred to as the Appin Mine Ventilation and Access Project (hereafter referred to as the Project).

1.2 Structure of Report and Standards Used in Assessment

This report has been prepared to assess the traffic impacts associated with the Project and will inform the preparation of the Modification Application.

The assessment has been undertaken in accordance with the requirements of Roads and Traffic Authority now TfNSW *Guide to Traffic Generating Developments October 2002*.

Other technical standards/publications referenced in this assessment include:

- Austroads Guide to Road Design and RMS supplements.
- Austroads Guide to Traffic Management and RMS supplements.
- Austroads Guide to Traffic Management Part 12. Traffic Impacts of Developments.

The remaining sections of this report address the following;

- Section 2 – describes the Project;
- Section 3 – examines the existing traffic conditions on the road network;
- Section 4 – evaluates the traffic impacts of the Project; and
- Section 5 – presents conclusions.

2.0 PROJECT

2.1 Existing Operations

The Appin Mine approval incorporates the underground longwall mining operations, which extract coal from the Bulli Seam using underground longwall mining methods, and the associated surface activities. The Mine primarily produces hard coking (metallurgical) coal and has an approved operational capacity of up to 10.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until 2041.

Longwall mining is currently being undertaken in the approved mining areas, Area 9 and Area 7, following completion of longwall mining activities at West Cliff Colliery in early 2016. Key surface facilities at the Mine include the:

- Appin East Colliery (Appin East);
- Appin West Colliery (Appin West);
- Appin North Colliery (Appin North);
- West Cliff Coal Preparation Plant (WCCPP);
- West Cliff Emplacement Area (WCEA);
- Appin East No. 1 and No. 2 ventilation shaft site;
- Appin East No. 3 ventilation shaft site;
- Appin West No. 6 ventilation shaft site; and
- Douglas Park substation site.

ROM coal is extracted from the Appin underground mining operations and delivered directly to the WCCPP by winder and conveyor, or is transported from Appin East via truck along Appin and Wedderburn Roads to the WCCPP. Processed coal (clean coal product) from the WCCPP is transported by road to the Port Kembla Coal Terminal (PKCT) for shipping to domestic and international customers, or to BlueScope Steel or other local customers.

The Mine is accessed via the shaft at Appin West and drifts at Appin North and Appin East. The Mine is ventilated by two distinct ventilation districts; Appin Mine and Appin North. The Appin Mine district is ventilated by two upcast shafts (No. 2 and No. 6), four downcast shafts (No. 1, No. 3, No. 4, and No. 5) and two intake drifts at Appin East. The Appin North district is ventilated by one upcast shaft (No. 1), one downcast shaft (No. 2) and one intake drift at Appin North.

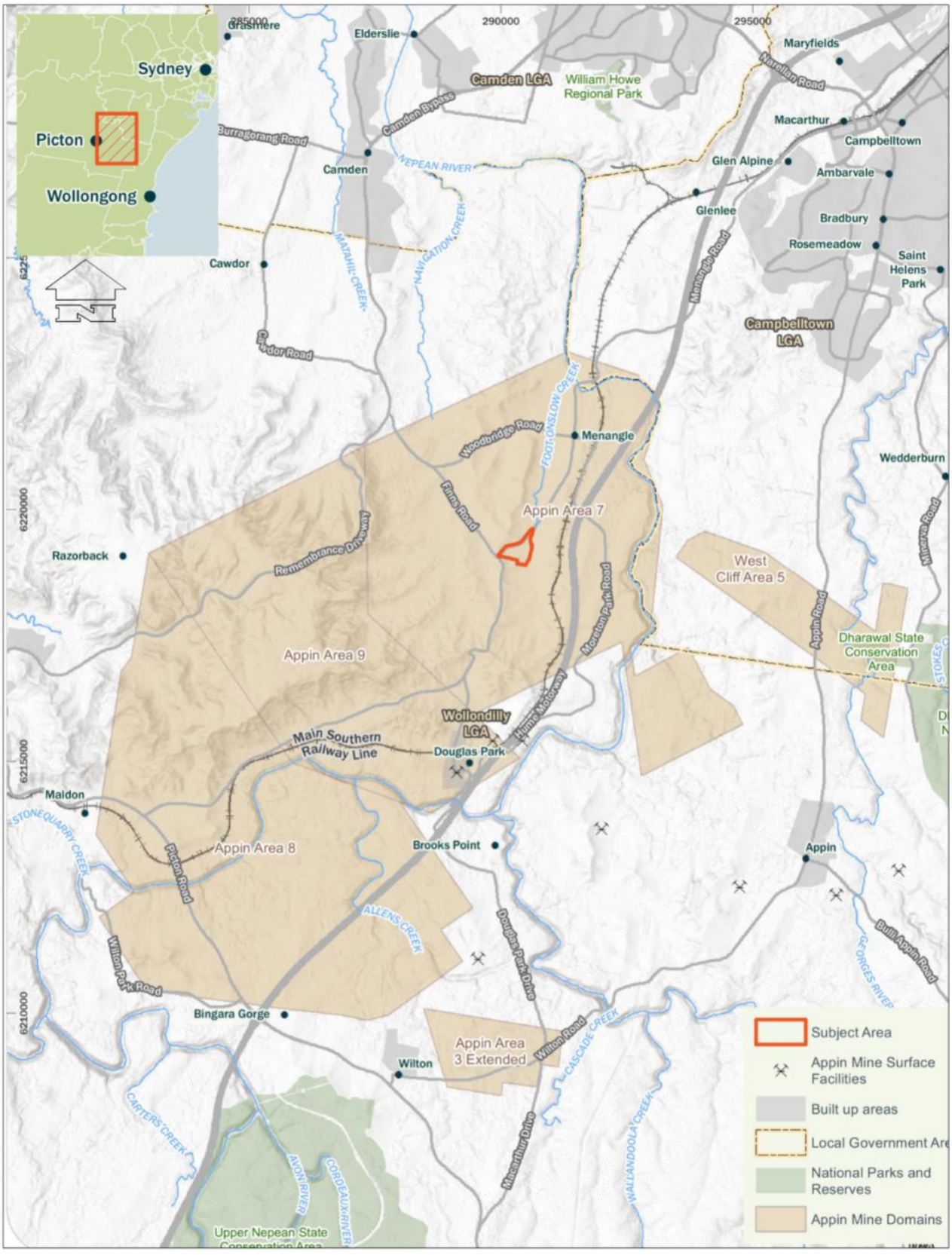
2.2 Proposed Modification

2.2.1 Project Area (the Site)

The Project Area (hereafter referred to as the Site) is approximately 35km northwest of Wollongong and 8km northwest of Appin (**Figure 1**). The township of Menangle is located approximately 1.3km to the northeast of the Site. The Site is located on land owned by IMC, within the Bulli Seam Operations Project Longwall Mining Area and within the South Campbelltown Mine Subsidence District in the Southern Coalfield of NSW.

The Site will incorporate Ventilation Shaft 7, Ventilation Shaft 8, mine access facilities and additional areas for associated works and infrastructure, such as the construction site access and the provision of services to the Site. The boundary of the Site and the extent of the assessment area are shown on **Figure 2**.

Infrastructure that will be developed on the Site will be positioned to align with the approved layout of the underground workings for Appin Area 7 (**Figure 3A**) to be proximal to required

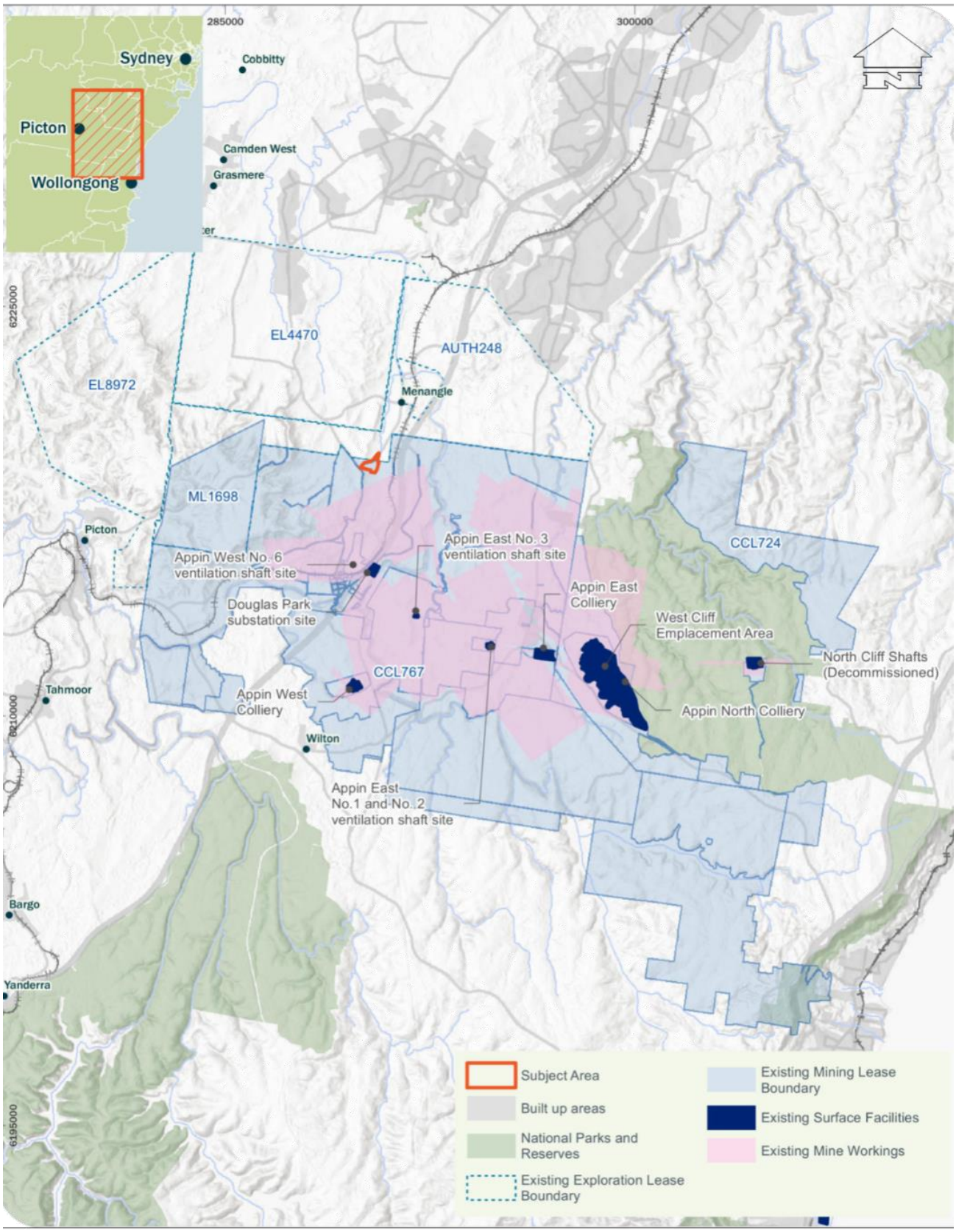


TRANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411

FIGURE 1

IMC VENT SHAFT
MENANGLE

LOCATION

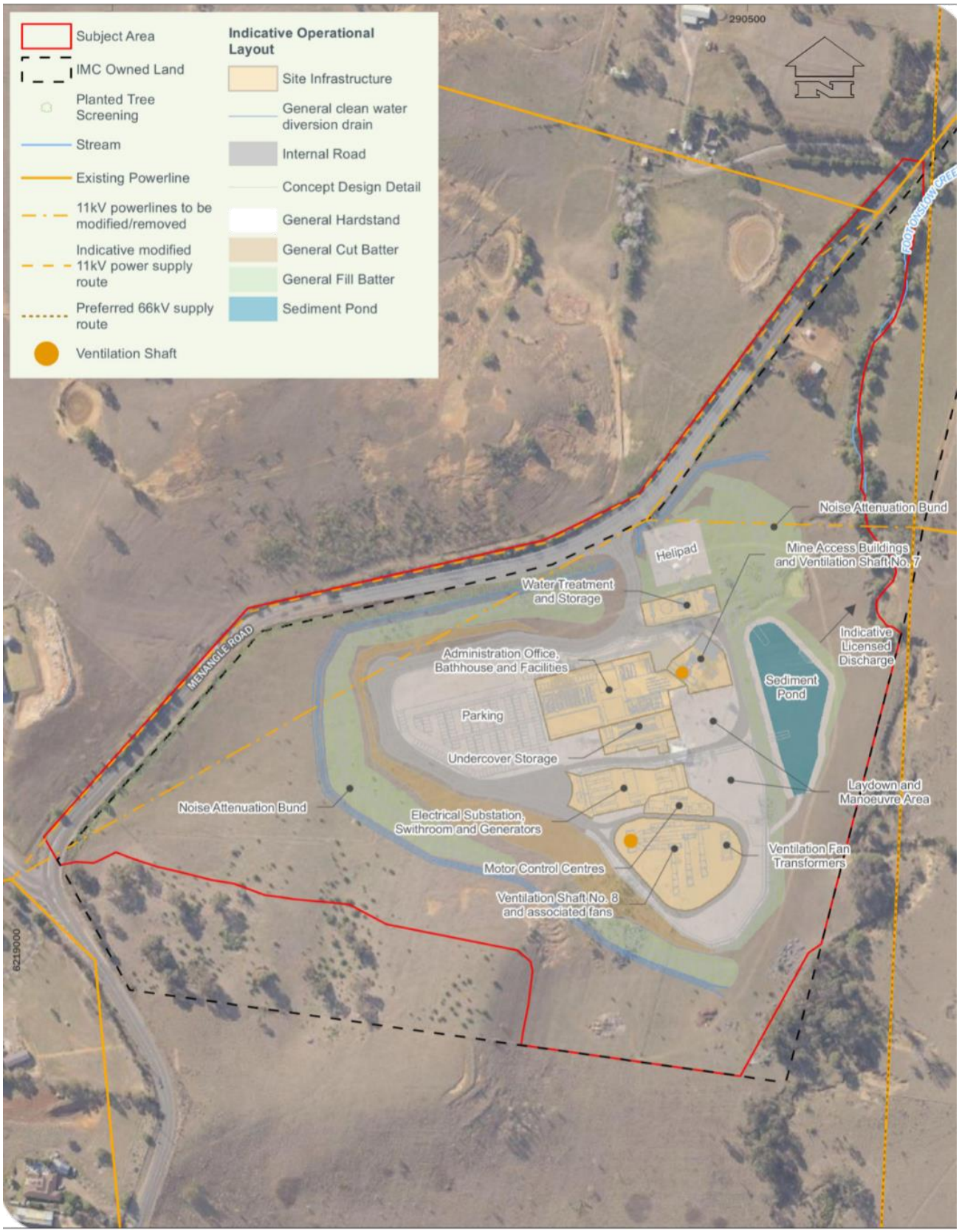


'RANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT
MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411

FIGURE 2

IMC VENT SHAFT
MENANGLE

SITE

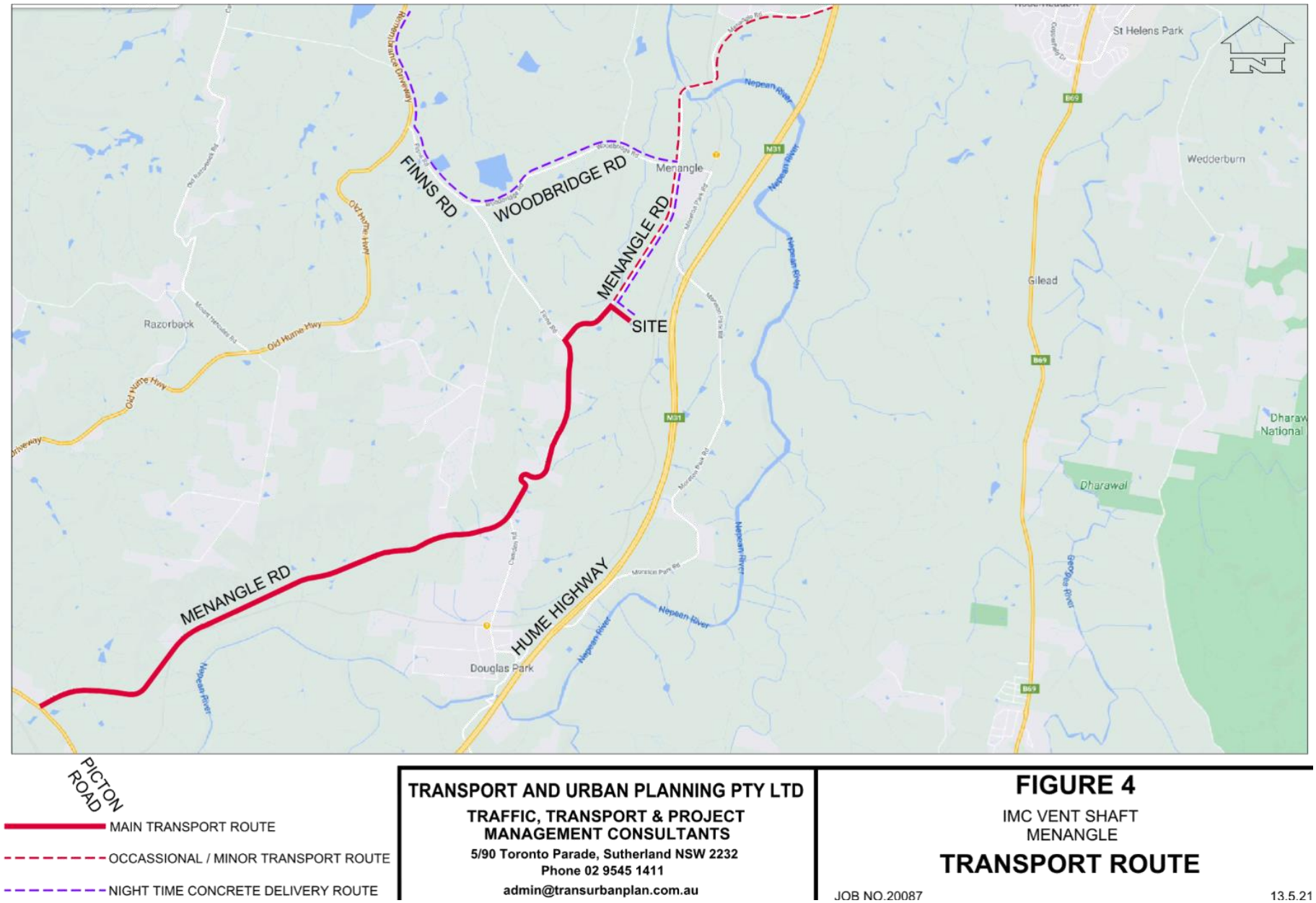


'RANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411

FIGURE 3A
IMC VENT SHAFT
MENANGLE
PROJECT

TRANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411
admin@transurbanplan.com.au

FIGURE 3B
IMC VENT SHAFT
MENANGLE
INDICATIVE SITE ENTRANCE ARRANGEMENTS ON MENANGLE ROAD


FINNS RD
WOODBRIDGE RD
MENANGLE RD
SITE
MENANGLE RD
HUME HIGHWAY
PICTON ROAD
Menangle
Douglas Park
Razorback
Gilead
Wedderburn
St Helens Park
Dharawal
Nepean River
Old Hume Hwy
M31
B69
MAIN TRANSPORT ROUTE
OCCASSIONAL / MINOR TRANSPORT ROUTE
NIGHT TIME CONCRETE DELIVERY ROUTE
TRANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411
admin@transurbanplan.com.au
FIGURE 4
IMC VENT SHAFT
MENANGLE
TRANSPORT ROUTE
JOB NO.20087
13.5.21

services and to minimise the potential impacts on the environment and communities of Menangle and Douglas Park.

2.2.2 Appin Mine Ventilation and Mine Access Project (the Project)

An integral requirement of underground mining is adequate ventilation infrastructure and mine access facilities to ensure a safe and efficient underground working environment. Appin Mine operations are progressing further away from the existing surface infrastructure located in the Appin and Douglas Park areas, and additional infrastructure is required to support the ongoing operations.

The Project involves the construction and operation of a downcast ventilation shaft (Ventilation Shaft 7), an upcast ventilation shaft (Ventilation Shaft 8), three (3) extraction fans, ducting and evases and associated ancillary infrastructure. Based on the current mining schedule, the additional ventilation shafts are required to be operational prior to 2025.

The Project also involves the development of mine access facilities including a headframe and personnel and materials winder (within Ventilation Shaft 7) and surface facilities consisting of offices, stores, bathhouse facilities and car parking areas. The establishment of these facilities would provide access for personnel and consumable materials to the Mine and will increase the safety and efficiency of transporting personnel and consumable materials underground.

To support the key infrastructure noted above, the Project will also include the following activities:

- installation of temporary and permanent site access arrangements, including upgrade or improvement to the Menangle Road intersection, internal roadways, associated hardstand and car parking areas;
- site preparation, including clearing of vegetation, demolition of existing structures and earthworks;
- installation of appropriate security (e.g. fencing) to prevent unauthorised access to the Site;
- installation of a water supply, power supply and transmission and associated electrical switch rooms, transformers and ancillary infrastructure;
- shaft material/spoil handling and emplacement activities and associated revegetation and landscaping activities to minimise visual impact of the Site;
- installation of personnel amenities such as bathhouses (e.g. changerooms), administration facilities and mines rescue facilities;
- installation of diesel storage tanks and associated pipelines;
- progressive development of sumps, pumps, pipelines, water storages and other water management infrastructure including fire protection and sewerage treatment facilities;
- installation of covered storage areas;
- installation of communications equipment including fibre optic cable and wireless infrastructure;
- installation ofservice boreholes to provide underground services;
- controlled release of excess water and/or re-use of water where practicable;
- progressive rehabilitation of disturbed areas post construction;
- installation of erosion and sediment control infrastructure, where required; and
- other associated minor infrastructure, plant, equipment and activities.

The Project would be similar to previously approved ventilation and mine access infrastructure of the Appin Mine and will not increase the volume of coal produced. Coal handling infrastructure is not proposed as part of the Project.

The shafts would be constructed from the surface down to the underground workings using conventional shaft sinking methods (mechanical excavation, drilling and controlled blasting) with material from the excavation being removed from the top of the shaft. The excavated material resulting from the construction of the shafts would be used as engineered fill and for construction of earth screening bunds and sediment dams. Where practicable, excess material would be stockpiled on-site, revegetated and used for future rehabilitation of the shaft site upon decommissioning. The two shafts would be lined progressively during excavation.

The Project will comprise multiple phases of construction and operation. Construction of the ventilation shafts is critical to the ongoing safe and efficient operation of the Appin Mine, and as such, will take priority for the construction phase. Construction of the downcast shaft will commence first. Once the shaft sinking is complete and the ventilation infrastructure is installed, each shaft will commence commissioning and operation immediately.

The construction phase (12-18 months) for establishing mine access infrastructure would occur subsequent to the ventilation infrastructure. Construction of mine access infrastructure will be influenced by scheduling and timing of longwall operations over the life of the BSO Project and will be developed in parallel with the requirements of the ongoing mining operations.

Activities associated with sinking the shafts would occur 24 hours per day, seven days per week. The remainder of construction activities associated with the facility (e.g. installation of surface infrastructure) would generally be limited to daytime construction hours[1]. Once operational, the site would be required to operate 24 hours per day, seven days per week, consistent with other similar facilities of the Mine.

2.2.3 Timing

Key dates for the construction of the various facilities and commissioning/operation of the ventilation shafts and the mine access are shown in Table 2.1 below. The timeframes are indicative and may be influenced by mining schedules and other factors including approval date and project funding approval. Construction of the ventilation shafts will take priority for the construction phase, being critical to ongoing operations.

[1] Daytime construction hours are defined as Monday to Saturday, 7.00am to 6.00pm.

TABLE 2.1

INDICATIVE TIMELINE FOR CONSTRUCTION AND OPERATION OF PROJECT

Activity	Start	Finish	Duration
Site establishment, bulk earthworks, construction utilities and access upgrades	July 2022	March 2023	7 months
Construction of permanent HV power supply infrastructure	March 2023	May 2024	14 months
VS7 sinking and lining	August 2023	December 2024	17 months
VS8 sinking and lining	June 2023	October 2024	17 months
Construction of fans, evase(s) and ancillary site infrastructure for ventilation shafts	February 2023	December 2024	22 months
Construction of mine access infrastructure: winder, evase, headframe and ancillary site infrastructure	July 2024	2026	12-18 months
Commissioning and operation of ventilation shafts	November 2024	2045	21 years
Commissioning and operation of mine access infrastructure	2025	2045	20 years
De-commissioning and site rehabilitation	2045	2050	5 years

2.2.4 Construction Phase

Construction is expected to commence in July 2022 with the ventilation shafts and fans completed in December 2024. Construction of the mine access infrastructure will take an additional 12-18 months and is planned to commence July 2024.

The upgrade of the Site Access Intersection will be undertaken at the start of the construction phase.

The construction workforce will vary based on the activities being undertaken. During the peak construction period where a number of activities overlap for a period of 6 to 8 weeks, up to 76 construction workers will be on site at the same time.

Heavy vehicle deliveries to the Site are expected to average 11-13 per day. During the peak construction period (6 to 8 weeks) up to 44 heavy vehicles per day could make deliveries to the Site.

Heavy vehicles will consist of rigid trucks and semi-trailers (up to 19 metres). A number of Special Purpose Vehicles and Oversize Vehicles will deliver large equipment to the Site. These vehicles will have the appropriate permits.

Delivery of concrete during the vent shaft construction will occur 24 hours, 7 days a week. Night time concrete deliveries are expected to come from Narellan (see Section 2.26 on Transport Routes).

Deliveries of other materials would occur between 7.00am – 6.00pm Monday to Saturday and the majority will access the Site from the south via Hume Highway, Picton Road and Menangle Road.

2.2.5 Operational Phase

During the operational phase, the Site will be required to operate 24 hours per day, 7 days per week.

The current shift arrangements of the Appin Mine are three (3) shifts on weekdays and two (2) shifts on weekends. Table 2.2 below shows the indicative shift times proposed for the workforce at the Site.

TABLE 2.2

INDICATIVE SHIFT TIMES DURING THE OPERATION OF THE PROJECT

Weekdays (Monday to Thursday)	Shift Times
Shift 1	6.00am – 3.00pm
Shift 2	2.00pm – 11.00pm
Shift 3	10.00pm – 7.00am
Weekends (Friday to Sunday)	
Shift 1	6.00am – 6.00pm
Shift 2	6.00pm – 6.00am

Total employee/contractor numbers on site per day during the operational phase will be approximately 283 people based on 80 people per shift, and 40 support personnel per day, including three people for ventilation infrastructure operation and maintenance.

In addition to the operational personnel, on maintenance day (which occurs one day per week) an additional 25 maintenance personnel will be on site. On a maintenance day total personnel on site will be approximately 308 people. Table 2.3 shows indicative numbers of personnel for the three weekday shifts on a maintenance day.

TABLE 2.3

SHIFT PERSONNEL ON A MAINTENANCE WEEKDAY MONDAY TO THURSDAY

Shift	Vent Shaft and Mine Operational Personnel*	Maintenance Personnel	Total
Shift 1 (6.00am – 3.00pm)	103	25	128
Shift 2 (2.00pm – 11.00pm)	90	-	90
Shift 3 (10.00pm – 7.00am)	90	-	90
TOTAL	**283**	**25**	**308**

**Includes shift personnel plus support staff*

Generally, the Mine workforce will be a redistribution of existing personnel who currently access the Mine from either Appin West, Appin East or Appin North. Additional support personnel will be required as part of Mine operational activities, such as for maintenance, inspections, office work and administration. During the life of the Project, alternative shift configurations may be required to meet operational and industry best practice requirements.

Operation and maintenance of both the ventilation and mine access infrastructure requires 24-hour access for regular inspection and maintenance. Where significant maintenance is required, additional personnel and equipment may be required onsite for short durations. This will generally occur during the daytime hours, unless emergency maintenance is required.

The number of visitors to the Site would vary day to day. Approximately five visitors are expected per day on average.

The Site will receive deliveries during operations. Deliveries are generally by rigid trucks and semi-trailers (up to 19 metres long).

Deliveries associated with the ventilation infrastructure maintenance and inspection would be 1 per day. Generally, the heavy vehicles associated with the mine operations (9 nine per day), will be a redistribution of existing heavy vehicles that currently deliver to the Mine by either Appin West, Appin East or Appin North. In addition, there will be two heavy vehicles associated with the removal of waste water providing a total of 12 heavy vehicles per day.

2.2.6 Transport Routes

Transport routes for heavy vehicles accessing the Site during operations will be generally via Hume Highway, Picton Road and Menangle Road from the south, to and from the Site. An occasional heavy vehicle (estimated as 10% of total) may arrive from and depart to the north via Menangle Road.

During construction the majority of heavy vehicles will access the Site via Hume Highway, Picton Road and Menangle Road (to and from the south).

Night time deliveries of concrete will be from Narellan and will use Remembrance Driveway, Finns Road, Woodbridge Road and Menangle Road, to and from the north (note: the section of Finns Road between Woodbridge Road and Menangle Road has a 15 tonne limit which necessitates the use of Woodbridge Road and Menangle Road between the Site and Woodbridge Road).

The transport routes are shown in **Figure 4**.

2.2.7 Proposed Intersection Upgrade Works and Car Parking

The Site Access Intersection will be provided as part of the Project. The intersection will be designed and constructed to Austroads standards, in consultation with Wollondilly Shire Council, and is planned to include;

- Left turn auxiliary lanes in Menangle Road for left turns to and out of the Site Access Road;
- A right turn bay (CHR treatment) on Menangle Road for right turns into the Site Access Road;
- Eastbound and westbound through lanes on Menangle Road.

Figure 3B shows an indicative Site Entrance Arrangement on Menangle Road.

The internal roads within the Site will be designed and constructed to AS2890.2 standards to accommodate 19 metre semi-trailers as appropriate.

Car parking for 212 cars, including two accessible spaces, will be provided on site, plus provision for future additional parking. The 212 spaces will be sufficient to cater for the maximum parking demand of employees/contractors and visitors at shift changeover times on a maintenance weekday.

3.0 EXISTING CONDITIONS

3.1 Road Network

The principal road network that will serve the Site includes Menangle Road, Picton Road and Hume Highway/Motorway.

Other roads adjacent the Site that may attract some vehicle movements from the Project include Finns Road, Woodbridge Road and Remembrance Driveway.

Menangle Road, Picton Road and the Hume Highway (Motorway) will be the main heavy vehicle route to/from the Site during construction and the operational phase of the Project.

The Hume Motorway, adjacent Picton Road is a two lane dual carriageway state road constructed as a Motorway. At Picton Road an interchange with north and south facing ramps is provided, which allow full access to and from Picton Road.

Picton Road, which is a state road, links the town of Picton to Hume Motorway and further to the east links to Princes Highway, north of Wollongong.

In the section between Menangle Road and Hume Motorway, Picton Road is constructed as a 2-3 lane rural road with wide sealed shoulders, centreline and edgeline road markings and guidepost and reflectors. Auxiliary or turning lanes (CHR and AUL) are provided at intersections including at Menangle Road, Allied Mills Access Road, Wilton Park Road and On and Off Ramps to Hume Motorway.

The speed limit in this section of Picton Road is a mixture of 80km/h and 100km/h.

Menangle Road is generally a two lane road that links between Picton Road and Macarthur near Campbelltown.

It is a regional road between Picton Road and the Nepean River at Menangle and a state road north of the Nepean River. The section between Picton Road and Finns Road and Menangle Road is a two lane rural road with centreline markings, edgelines, Raised Reflective Pavement Markers (RRPMs) and sealed shoulders.

The speed limit is predominantly 100km/h and 80km/h with a short section (approximately 900 metres) of 60km/h speed limit, north of Camden Street, where there is a change in alignment with sharp curves. South and north of Finns Road the speed limit is 80km/h which continues to the village of Menangle where it reduces to 50km/h.

North of Woodbridge Road/Station Street and the Menangle Village, Menangle Road is a two lane road with a speed limit of 80km/h.

Principal intersections between Picton Road and Menangle Village include;

- Wrighton Way which is a priority controlled T junction intersection with an AUL treatment in Menangle Road;
- Camden Road which is a priority controlled T junction intersection with CHR right turn and AUL left turn treatments in Menangle Road;
- The Ventilation Shaft 6 Access Road, which is a Stop Sign controlled T junction intersection with a CHR right turn treatment in Menangle Road;
- Finns Road which is a channelised priority controlled T junction intersection;
- Picton Green Access Road which is a Stop Sign controlled T junction intersection in Menangle Village;
- St James Avenue which is a priority controlled T junction intersection in Menangle Village;

- Woodbridge Road/Station Street which is a Stop Sign controlled cross junction intersection in Menangle Village.

Finns Road is a local two lane rural road that connects between Menangle Road and Remembrance Driveway. Traffic management along its length includes centreline and edgeline roadmarking, RRPMs, guideposts and reflectors, warning signs and sealed shoulders. Finns Road has an 80km/h speed limit.

Intersections along Finns Road include;

- Dawson Road which is a priority controlled minor T junction intersection;
- Woodbridge Road which is a Stop Sign controlled T junction intersection; and
- Carmells Road which is a priority controlled minor T junction intersection.

Finns Road forms a T junction intersection with Remembrance Driveway (Old Hume Highway) under priority control. The traffic management at the intersection includes CHR seagull treatment in Remembrance Driveway to cater for right turns into and out of Finns Road and an AUL left turn treatment in Remembrance Driveway for the left turn into Finns Road. Wollondilly Council is currently upgrading the intersection to a two lane roundabout to improve road safety and increase traffic flow. This will reduce delays for vehicles turning right out of Finns Road and improve overall traffic conditions at the intersection.

Woodbridge Road is a local two lane rural road that connects between Finns Road and Menangle Road in Menangle Village. Traffic management along its length includes centreline and edgeline road marking, RRPMs, guideposts and reflectors, warning signs and sealed shoulders. Woodbridge Road has an 80km/h speed limit between Finns Road and 190m west of Menangle Road and a 60km/h speed limit through Menangle Village. East of Menangle Road, Woodbridge Road becomes Station Street.

Intersections along Woodbridge Road include Camden Park Road which is a Stop Sign controlled minor T-junction intersection.

Remembrance Driveway connects between Picton Road and Camden and is a regional road. In the rural sections of the route, it is a 2-3 lane road, with centreline and edgeline road markings, RRPMs, sealed shoulders and warning signs.

The speed limit varies between 80km/h and 100km/h.

Figure 5 shows the existing traffic controls on the road network near the Project Site.

3.2 Existing Traffic Conditions

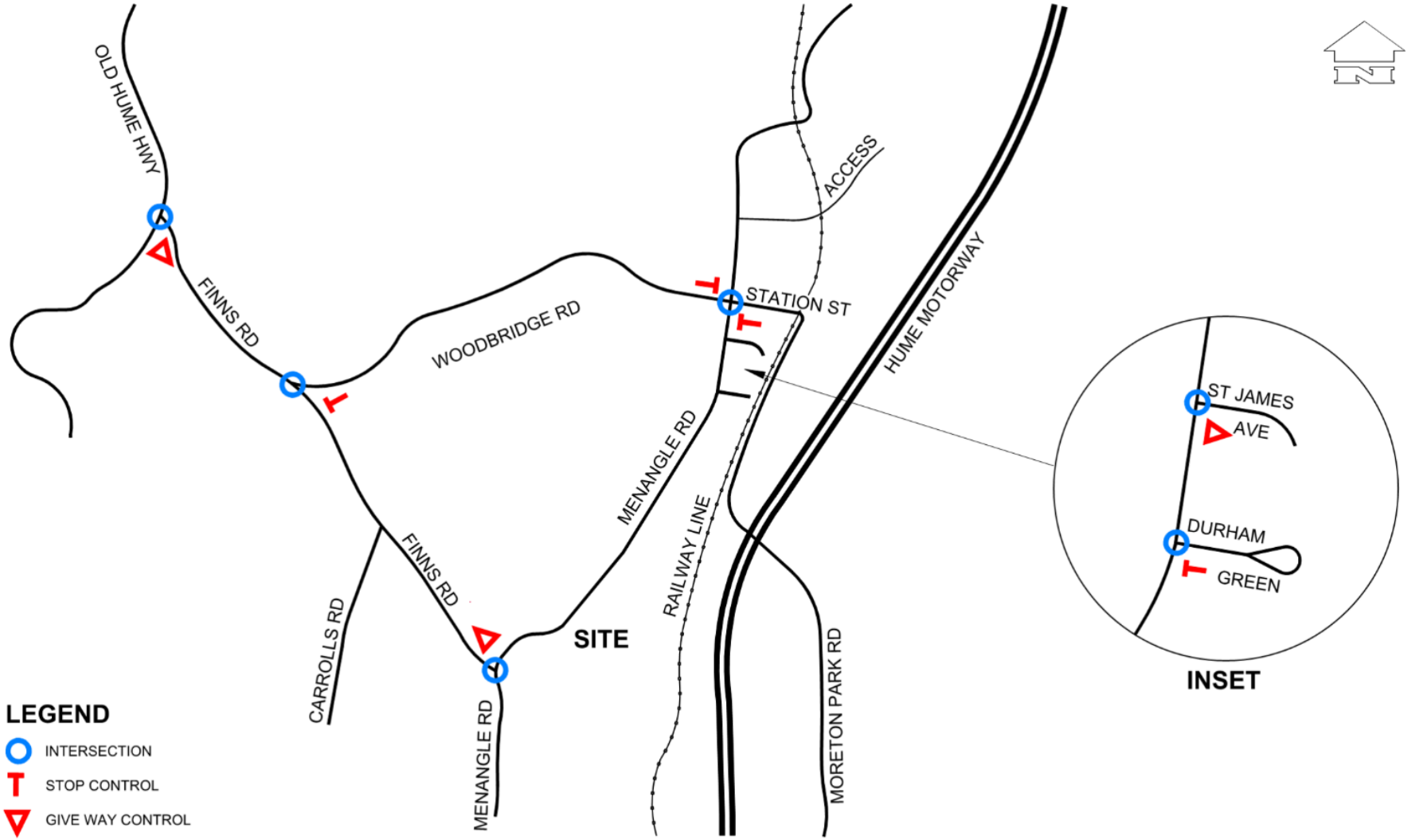
3.2.1 Daily Volumes and Vehicle Classifications

Table 3.1 shows the two way average weekday (5 day average) and two way average daily (7 day average) traffic volumes, together with the proportion of heavy vehicles using the road network, adjacent the Project Site.

Heavy vehicles are classified as Austroad Class 3-12 vehicles and include small, medium and articulated trucks and buses.

Reference to Table 3.1 shows that the weekday two way traffic volumes using Menangle Road varies as follows;

- South of Camden Road – 3,940 vehicles per day (vpd)



TRANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411
admin@transurbanplan.com.au

FIGURE 5

IMC VENT SHAFT
MENANGLE

EXISTING TRAFFIC CONTROLS

JOB NO 20087 13.5.21

- South of Finns Road – 5,760vpd
- North of Finns Road – 3,081vpd (near the Project Site Entrance) Station Street
- North of Woodpark Road – 7,304vpd

Adjacent the Project Site, two way weekday volumes on Menangle Road are 3,081vpd.

Weekday two way traffic volumes using Finns Road vary between 3,532vpd near Menangle Road and 7,579vpd near Remembrance Driveway.

TABLE 3.1

WEEKDAY AND DAILY TWO WAY TRAFFIC VOLUMES AND PROPORTION OF HEAVY VEHICLES

Location	Average Weekday (5 Day)		Average Day (7 Day)	
	Volume (vpd)	% of Heavy Vehicles	Volume (vpd)	% of Heavy Vehicles
Menangle Road 850 metres north of Woodbridge Road	7304	12.5%	6612	11.7%
Menangle Road between Woodbridge Road and St James Avenue	3622	-	3341	-
Menangle Road approx. 700m north of Finns Road	3081	11.2%	2899	9.9%
Menangle Road approx. 600m south of Finns Road	5760	7.4%	5527	6.5%
* Menangle Road south of Camden Road	3940	13.0%	3729	11.7%
Finns Road between Carols Road and Menangle Road	3532	7.8%	3422	7.0%
Finns Road between Remembrance Highway (Old Hume Highway) and Woodbridge Road	7579	11.2%	6862	11.0%
Woodbridge Road between Finns Road and Menangle Road	4092	10.4%	3644	9.9%
* Camden Road east of Menangle Road	3061	13.7%	2858	12.7%

Source: Traffic Counts 20 -26 October and 19-25 November 2020
** Traffic Counts 2-8 December 2019*

Figure 6 shows a summary of the two way weekday and daily volumes using the road network together with the average weekday volumes by direction.

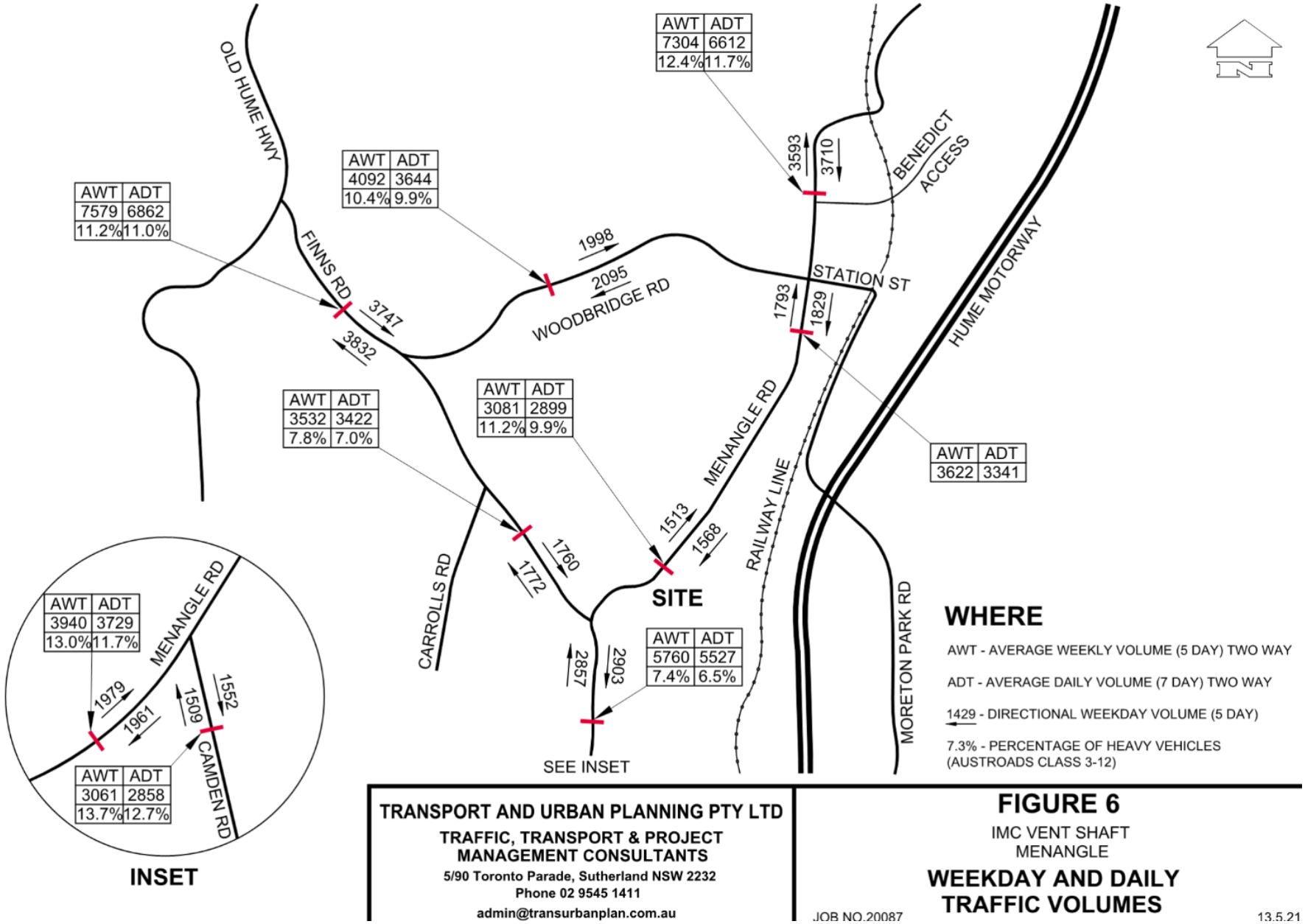
3.2.2 Intersection Traffic Volumes in AM and PM Peak Periods

Intersection traffic counts were undertaken across the road network during the weekday AM and PM peak periods between 6.30am and 9.30am and 3.00pm and 6.30pm. These counts were undertaken on Tuesday 20 October 2020 and Tuesday 3 December 2019.

The AM and PM Peak Hours at intersections generally occurred between 7.45am – 8.45am and 4.45pm - 5.45pm.

However, these times do not match with the mine peak shift time changes (AM and PM Site Peak Hours) which will occur between;

- 7.00am – 8.00am (AM Site Peak Hour); and
- 3.00pm – 4.00pm (PM Site Peak Hour).


OLD HUME HWY
FINNS RD
WOODBRIDGE RD
STATION ST
BENEDICT ACCESS
HUME MOTORWAY
MENANGLE RD
CARROLLS RD
RAILWAY LINE
MORETON PARK RD
CAMDEN RD
SITE
SEE INSET
AWT ADT 7304 6612 12.4% 11.7%
AWT ADT 4092 3644 10.4% 9.9%
AWT ADT 7579 6862 11.2% 11.0%
AWT ADT 3532 3422 7.8% 7.0%
AWT ADT 3081 2899 11.2% 9.9%
AWT ADT 3622 3341
AWT ADT 5760 5527 7.4% 6.5%
AWT ADT 3940 3729 13.0% 11.7%
AWT ADT 3061 2858 13.7% 12.7%
3593
3710
1998
2095
3747
3832
1793
1829
1513
1568
1760
1772
2857
2903
1979
1961
1509
1552
INSET
WHERE
AWT - AVERAGE WEEKLY VOLUME (5 DAY) TWO WAY
ADT - AVERAGE DAILY VOLUME (7 DAY) TWO WAY
1429 - DIRECTIONAL WEEKDAY VOLUME (5 DAY)
7.3% - PERCENTAGE OF HEAVY VEHICLES (AUSTROADS CLASS 3-12)
TRANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411
admin@transurbanplan.com.au
FIGURE 6
IMC VENT SHAFT
MENANGLE
WEEKDAY AND DAILY TRAFFIC VOLUMES
JOB NO.20087
13.5.21

Figures 7 and **8** show the intersection traffic volumes across the road network for the AM Site Peak Hour (**Figure 7**) and PM Site Peak Hour (**Figure 8**).

Site observations and traffic modelling (See Section 4.3) confirm that all intersections operate with a good level of service (Level of Service A operation) and low vehicle delays, during the weekday AM and PM periods.

3.3 Pedestrians

Pedestrian activity across the road network was very low. Small numbers of pedestrians crossed at the Menangle Road/Woodbridge Road/Station Street intersection during the PM period. There was no recorded pedestrian crossing movements at the other intersections during the AM and PM periods.

Pedestrian crossing volumes are shown in **Figures 7** and **8**.

3.4 Bicycles

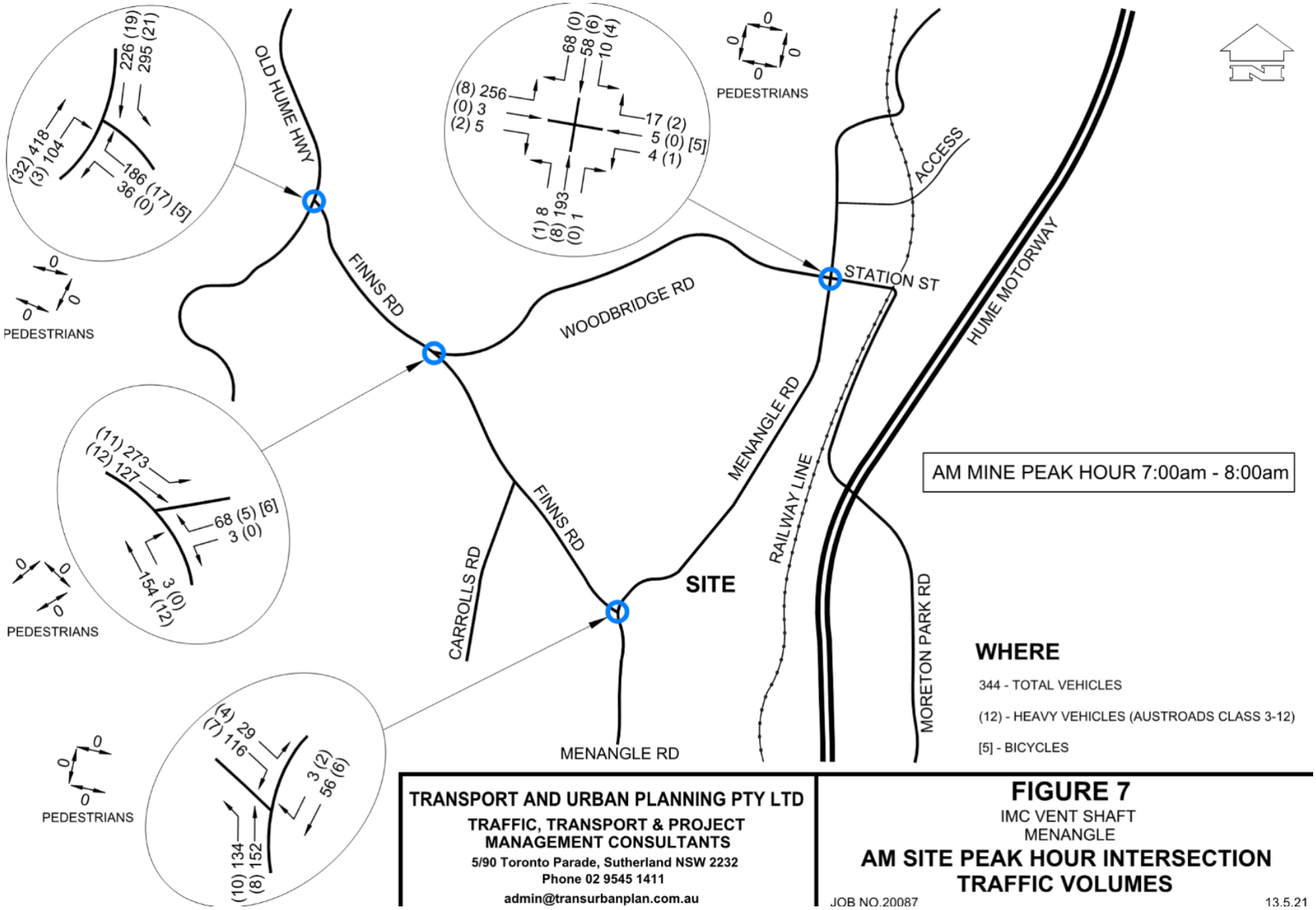
There are no formal bike routes on the road network adjacent the Project Site. Cyclists are required to use the roads and share the travel lanes with cars/trucks as the road shoulder areas are variable on most roads including Menangle Road.

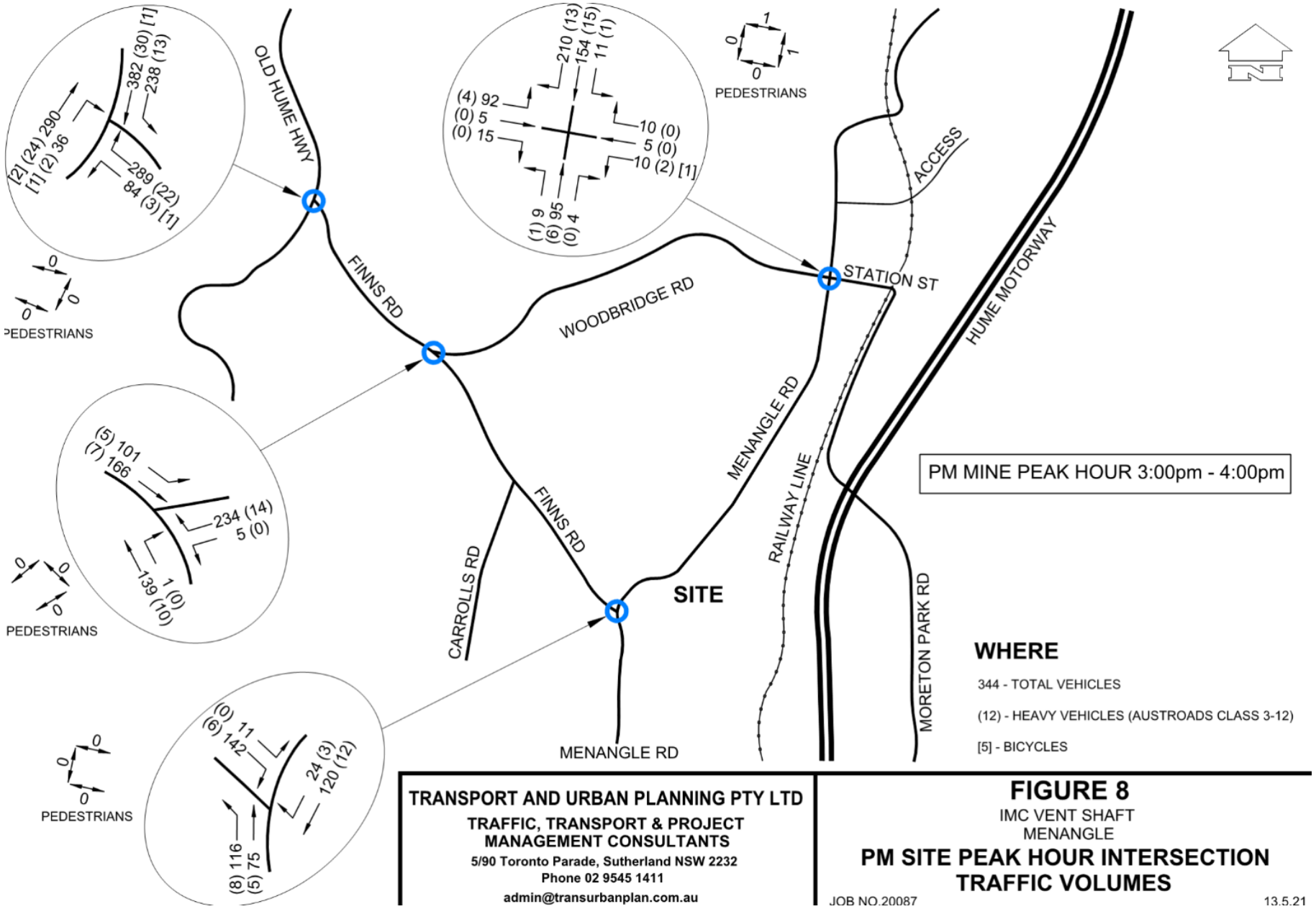
Cyclist volumes using the road network are also shown in **Figures 7** and **8**. Reference to **Figures 7** and **8** reveal that cyclists volumes using the road network are very low.

3.5 Bus Routes

Bus routes in the area include:

- The 889 bus service between Menangle and Campbelltown via Menangle Park which uses the section of Menangle Road north of Durham Green as well as Station Street; and
- The 49 bus service between Camden and Menangle with Razorback Loop, which uses Menangle Road, Finns Road and Woodbridge Road.


OLD HUME HWY
FINNS RD
WOODBRIDGE RD
STATION ST
ACCESS
HUME MOTORWAY
MENANGLE RD
FINNS RD
CARROLLS RD
RAILWAY LINE
MORETON PARK RD
SITE
MENANGLE RD
PEDESTRIANS
PEDESTRIANS
PEDESTRIANS
PEDESTRIANS
(32) 418
(3) 104
226 (19)
295 (21)
186 (17) [5]
36 (0)
(8) 256
(0) 3
(2) 5
68 (0)
58 (6)
10 (4)
17 (2)
5 (0) [5]
4 (1)
(1) 8
(8) 193
(0) 1
(11) 273
(12) 127
68 (5) [6]
3 (0)
3 (0)
154 (12)
(4) 29
(7) 116
3 (2)
56 (6)
(10) 134
(8) 152
AM MINE PEAK HOUR 7:00am - 8:00am
WHERE
344 - TOTAL VEHICLES
(12) - HEAVY VEHICLES (AUSTROADS CLASS 3-12)
[5] - BICYCLES
TRANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411
admin@transurbanplan.com.au
FIGURE 7
IMC VENT SHAFT
MENANGLE
AM SITE PEAK HOUR INTERSECTION TRAFFIC VOLUMES
JOB NO.20087
13.5.21


OLD HUME HWY
FINNS RD
WOODBRIDGE RD
STATION ST
ACCESS
HUME MOTORWAY
MENANGLE RD
FINNS RD
CARROLLS RD
RAILWAY LINE
MORETON PARK RD
SITE
MENANGLE RD
PEDESTRIANS
PEDESTRIANS
PEDESTRIANS
PEDESTRIANS
PM MINE PEAK HOUR 3:00pm - 4:00pm
WHERE
344 - TOTAL VEHICLES
(12) - HEAVY VEHICLES (AUSTROADS CLASS 3-12)
[5] - BICYCLES
TRANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411
admin@transurbanplan.com.au
FIGURE 8
IMC VENT SHAFT
MENANGLE
PM SITE PEAK HOUR INTERSECTION TRAFFIC VOLUMES
JOB NO.20087
13.5.21

4.0 ASSESSMENT OF TRAFFIC IMPACTS OF PROPOSAL

4.1 Proposed Access

Access to the Site will be via a new T junction intersection in Menangle Road, north of Finns Road.

The intersection will be designed and constructed to Austroad standards and will include;

- Eastbound and westbound through lanes on Menangle Road.
- Left turn auxiliary lanes on Menangle for left turns to and out of the Site Access Road; and
- A right turn bay (CHR treatment) on Menangle Road for right turns into the Site Access Road.

Access roads will be constructed within the Site to link the main activity areas and car parking to the Site Access Intersection.

4.2 Traffic Generation During Operational Phase

The highest traffic generation of the Project will occur on weekdays associated with the workforce trips to and from the Site as well as delivery and maintenance vehicles visiting the Site. Based on information provided by IMC, workforce trips to Appin Mine currently have a vehicle occupancy of 1.2 persons per vehicle. For the purpose of this assessment a conservative figure of 1.1 persons per vehicle has been adopted.

Based on a total of 308 personnel on site on a maintenance weekday, (reference Section 2.25) adopting a vehicle occupancy of 1.1 persons per vehicle, the trip generation of the workforce is estimated at 564 two way vehicle trips (282 in/282 out). These would be light vehicle trips. Visitors could add an additional 10 two way light vehicle trips per day (i.e. 5 in/5 out).

Heavy vehicles associated with the mine operations and ventilation shafts are expected to number 24 two way vehicle trips per day (12 in/12 out).

Total vehicles generated by the project on a maintenance weekday will be 598 two way vehicle trips (i.e. 299 in/299 out) which will include 574 two way light vehicle trips and 24 two way heavy vehicle trips.

The peak traffic generation of the mine will occur at the shift time changes for the mine operations which will occur at different times during the day.

Arrival and departure times for the workers on a weekday (Monday to Thursday) will be;

- 5.00am – 6.00am – Shift 1 arrives
- 7.00am – 8.00am – Shift 3 departs
- 1.00pm – 2.00pm – Shift 2 arrives
- 3.00pm – 4.00pm – Shift 1 departs
- 9.00pm – 10.00pm – Shift 3 arrives
- 11.00pm – 12.00pm – Shift 2 departs

Arrival and departure times for the workers on a Friday (weekend shift);

- 5.00am – 6.00am – Shift 1 (weekend) arrives
- 7.00am – 8.00am – Shift 3 departs
- 5.00pm – 6.00pm – Shift 2 (weekend) arrives
- 6.00pm – 7.00pm – Shift 1 (weekend) departs

The 7.00am to 8.00am and 3.00pm to 4.00pm weekday shift changeover times represent the Site AM and PM Peak Hours.

On weekdays that are maintenance days, the traffic generation is estimated to be;

- 7.00am to 8.00am (Shift 3 departs) - a total of 84 vehicles with one (1) heavy vehicle entering the Site and 82 worker light vehicles and one (1) heavy vehicle exiting the Site (1 in/83 out).
- 3.00pm to 4.00pm (Shift 1 departs) - a total of 118 vehicles with one (1) heavy vehicle entering the Site and 116 worker light vehicles and one (1) heavy vehicle exiting the Site (1 in/117 out).

4.3 Assessment of Traffic Impacts

Based on the current records of the existing workforce at Appin Mine, IMC expect the majority of the workforce (93%) to arrive and depart the Site from/to the south via Menangle Road from Picton Road with a smaller proportion (7%) arriving and departing from/to the north.

As previously noted, the majority of heavy vehicles are expected to arrive from and depart to the south via Menangle Road and Picton Road, with the occasional heavy vehicle (estimated as 10% of total) arriving from and departing to the north.

Impact on Road Network

The Project (on a maintenance weekday) will increase weekday traffic volumes using the road network as follows;

- 43 two way vehicle trips per day (vpd) in Menangle Road north of the Project Site Entrance including two heavy vehicles; and
- 555 two way vehicle trips per day (vpd), including 22 heavy vehicle trips in Menangle Road south of the Project Site Entrance.

The weekday volume increases due to the Project represent;

- 1.2% increase in weekday traffic volumes on Menangle Road, south of Woodbridge Road; and
- 9.6% increase in daily volumes on Menangle Road, south of Finns Road.

Table 4.1 shows the increases due to the Project.

TABLE 4.1

WEEKDAY TRAFFIC VOLUME INCREASES IN MENANGLE ROAD DUE TO THE PROJECT ON A MAINTENANCE WEEKDAY

Location	Average Weekday (5 day) (vpd)	Increase	% Increase
Menangle Road between Woodbridge Road and St James Avenue	3622	43	1.2%
Menangle Road south of Finns Road	5760	555	9.6%

Impact on Intersections

The AM (7.00am – 8.00am) and PM (3.00pm – 4.00pm) Site Peak Hours will represent those times when the additional traffic from the Project will have the largest impact on the intersections adjacent the Project site.

Figures 9 and **10** shows the additional traffic from the Project assigned to the road network during the AM Site Peak Hour and PM Site Peak Hour respectively.

To assess the impacts on the adjacent intersections, as well as the proposed Site Entrance/Menangle Road intersection, traffic modelling using the SIDRA Traffic Model has been undertaken.

The intersections modelled include;

- Menangle Road/Woodbridge Road/Station Street;
- Menangle Road/Finns Road; and
- Menangle Road/Site Entrance.

SIDRA is a suitable model to assess the operational performance of intersections. Criteria for interpreting an intersections operation are Level of Service (LS), Degree of Saturation (DS) and Average Vehicle Delay (AVD). For intersections under Priority/Stop Sign control and Roundabout Control, Average Vehicle Delay for Individual Movements (HMD) is relevant.

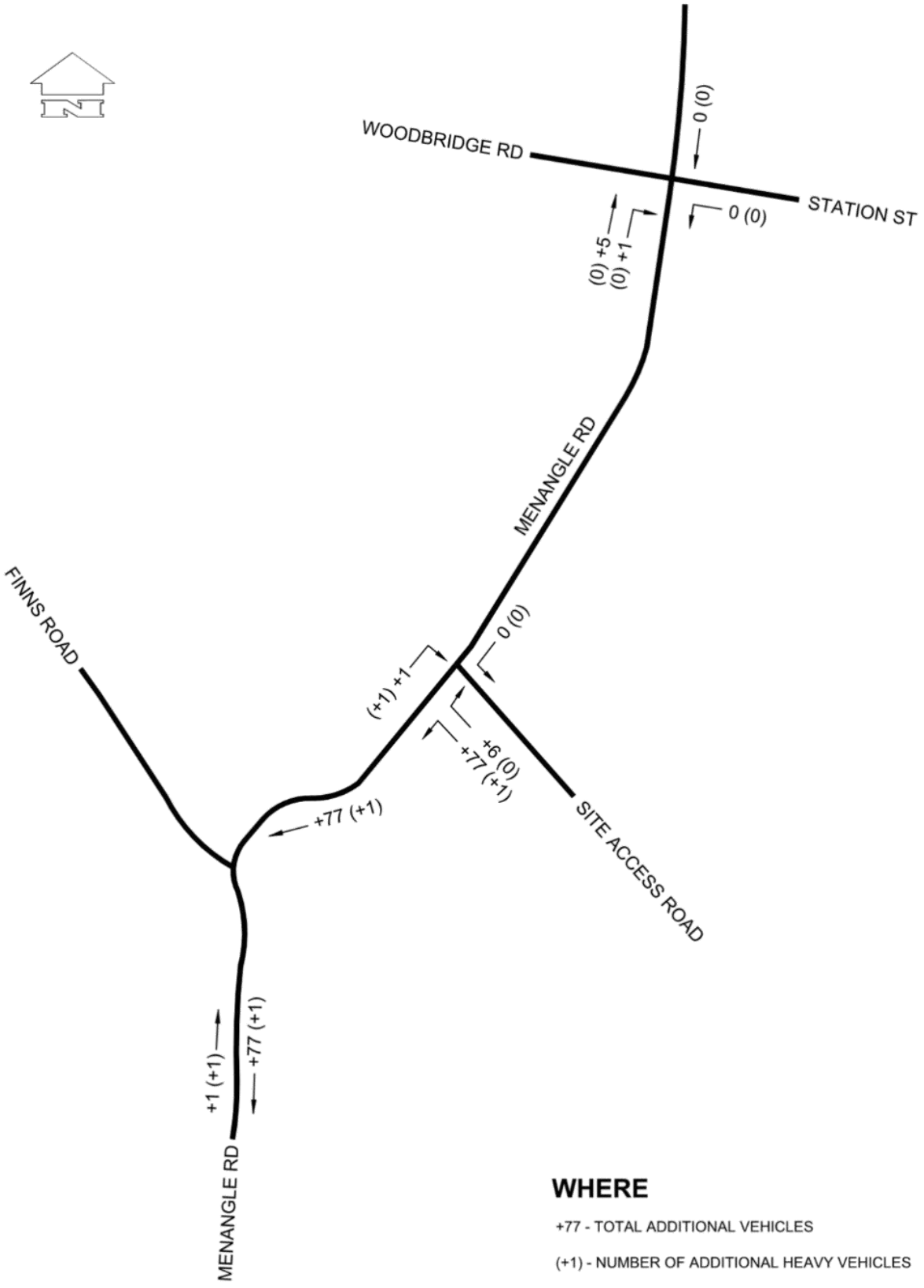
Table 4.2 below is reproduced from the RTA's Guide to Traffic Generation Developments (October 2002) and provides an explanation of the various levels of service for intersections.

A Level of Service D or better (i.e. A, B, C or D) is generally considered to be minimum design requirement for intersections. The level of service for intersections controlled by Give Way/Stop Signs or under Roundabout Control is determined from the movement with highest average vehicle delay (HMD). For intersections controlled by traffic signals the level of service is determined by the Average Vehicle Delay (AVD) for all vehicles using the intersection.

TABLE 4.2

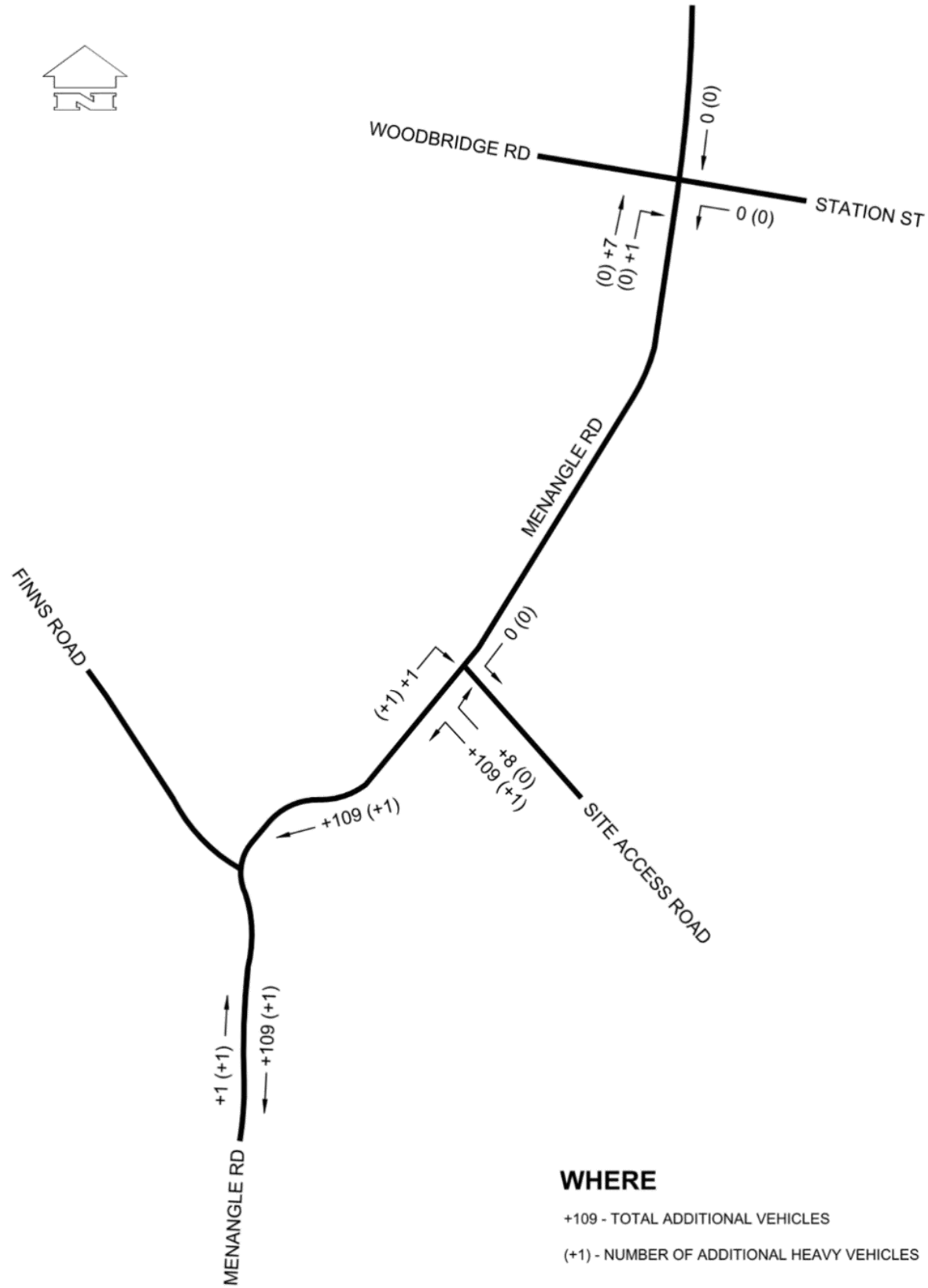
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Intersection is oversaturated	Oversaturated, requires other control mode



'RANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411

FIGURE 9
IMC VENT SHAFT
MENANGLE
ADDITIONAL TRAFFIC FROM PROJECT IN AM SITE PEAK 7am-8am



'RANSPORT AND URBAN PLANNING PTY LTD
TRAFFIC, TRANSPORT & PROJECT MANAGEMENT CONSULTANTS
5/90 Toronto Parade, Sutherland NSW 2232
Phone 02 9545 1411

FIGURE 10
IMC VENT SHAFT
MENANGLE
ADDITIONAL TRAFFIC FROM PROJECT IN PM SITE PEAK 3pm-4pm

SIDRA models have been developed for the existing 2020 conditions based on traffic management at the existing intersections and the traffic volumes for AM and PM Site Peak Hours as shown in **Figures 7** and **8**.

As the mine operations are expected to operate from 2025, the models with the additional traffic from the Project as shown in **Figures 9** and **10** have adopted 2025 base traffic volumes based on 2% lineal increase per year between 2020 and 2025 (i.e. 10% increase).

The model for the Site Entrance has adopted the proposed traffic management as shown in **Figure 3** which includes the left turn auxiliary lane and right turn bay (CHR) on Menangle Road.

The results of the modelling are shown in Tables 4.3, 4.4 and 4.5.

Reference to Table 4.3 shows that the intersection of Menangle Road/Woodbridge Road/Station Street currently operates at a Level of Service A in both peak hours with low vehicle delays. In 2025 with the Project in place it will operate at a Level of Service B operation in both peak hours which represents a good operation. The increase in vehicle delay due to the Project is very small.

Reference to Table 4.4 shows that the intersection of Menangle Road/Finns Road currently operates at a Level of Service A operation in both peak hours with low vehicle delays. With the Project in 2025 the intersection will continue to operate at a Level of Service A operation in both peak hours with low vehicle delays, which is a good operation.

Table 4.5 shows that the Menangle Road/Site Entrance intersection in 2025 with the Project in place will operate at a Level of Service A operation, with low vehicle delays which is a good operation.

Extracts from the SIDRA modelling are contained in Appendix 1.

TABLE 4.3

SIDRA MODELLING RESULTS FOR INTERSECTION OF MENANGLE ROAD/WOODBRIDGE ROAD AND STATION STREET FOR EXISTING CONDITIONS AND WITH PROJECT IN 2025

CRITERIA	EXISTING (2020)		2025 WITH PROJECT	
	AM	PM	AM	PM
LS	A	A	B	B
DS	0.233	0.217	0.267	0.242
AVD(seconds)	4.9	4.0	5.0	4.1
HMD(seconds)	13.3	14.1	15.0	16.3

Where:
LS Level of Service
DS Degree of Saturation
AVD Average Vehicle Delay (in seconds)
HMD Highest Movement Delay (in seconds)

TABLE 4.4

SIDRA MODELLING RESULTS FOR INTERSECTION OF MENANGLE ROAD/FINNS ROAD FOR EXISTING CONDITIONS AND WITH PROJECT IN 2025

CRITERIA	EXISTING (2020)		2025 WITH PROJECT	
	AM	PM	AM	PM
LS	A	A	A	A
DS	0.144	0.097	0.173	0.139
AVD(seconds)	4.4	3.8	4.0	3.1
HMD(seconds)	10.0	8.4	10.7	9.2

Where:
LS Level of Service
DS Degree of Saturation
AVD Average Vehicle Delay (in seconds)
HMD Highest Movement Delay (in seconds)

TABLE 4.5

SIDRA MODELLING RESULTS FOR INTERSECTION OF MENANGLE ROAD/SITE ENTRANCE ROAD IN 2025 WITH PROJECT

CRITERIA	2025 WITH PROJECT	
	AM	PM
LS	A	A
DS	0.103	0.097
AVD(seconds)	1.2	1.7
HMD(seconds)	9.3	10.2

Where:
LS Level of Service
DS Degree of Saturation
AVD Average Vehicle Delay (in seconds)
HMD Highest Movement Delay (in seconds)

Sensitivity Test of Site Entrance/Menangle Road Intersection

During both the AM and PM Site Peak Hours the right turn volumes into the Site will be very small, as these times do not coincide with a shift arrival period for the workforce.

Even though the AM and PM Site Peak Hours do not coincide with a shift arrival period of the workforce, to demonstrate that the intersection will have sufficient capacity including the length of the right turn bay, sensitivity analysis has been undertaken at the Site Entrance Intersection. This sensitivity analysis assumes that a workforce arrival period occurs during the AM and PM Site Peak Hours and is representative of shift times overlapping and/or a change in shift times in the future. Based on the arrival volumes of Shift 1 on a maintenance weekday, some 118 vehicles per hour (117 light vehicle trips and 1 heavy vehicle trip) would arrive at the Site. The right and left turn volumes into the Site would be 109vph and 8vph.

These volumes have been overlaid onto the AM and PM Site Peak volumes that will use the intersection and additional SIDRA modelling has been undertaken.

The results of this modelling is shown in Table 4.6 and indicates that the Site Entrance intersection will retain a Level of Service A operation with low vehicle delays in both peak hours, with the additional right turn volumes.

This indicates that the intersection will have sufficient spare capacity.

TABLE 4.6

SIDRA MODELLING RESULTS FOR INTERSECTION OF MENANGLE ROAD/SITE ENTRANCE ROAD IN 2025 WITH PROJECT AND INCREASED RIGHT TURN VOLUME INTO SITE

CRITERIA	2025 WITH PROJECT AND INCREASED RIGHT TURN VOLUME INTO SITE	
	AM	PM
LS	A	A
DS	0.104	0.097
AVD(seconds)	2.7	3.1
HMD(seconds)	7.2	7.7

Where:
LS Level of Service
DS Degree of Saturation
AVD Average Vehicle Delay (in seconds)
HMD Highest Movement Delay (in seconds)

Extracts from the SIDRA modelling are contained in Appendix 1.

4.4 Cumulative Impacts

A large proportion of those workers that will access the mine via the Site in 2025 (estimated as 308 people per day on a maintenance weekday) would currently access the mine via Appin West, Appin East or Appin North. There may be a small increase in the workforce associated with the operation of the additional mine access and ventilation shaft infrastructure constructed as part of the Project.

Similarly, a proportion of those heavy vehicles that will service the Mine via the Site in 2025 (estimated at 12 vehicles per day) are already servicing the mine via Appin West, Appin East or Appin North. A small increase in heavy vehicle trips will occur due to the ventilation shaft operation and the Mine access.

Therefore, the majority of the workforce trips associated with the Site's operation, as well as the heavy vehicles generated by the Appin Mine's operation are already using the road network, albeit not the section of Menangle Road adjacent the Project Site.

Notwithstanding this, a conservative approach to the cumulative impacts has been adopted to assess the impact on the intersections based on a 20% increase in background traffic growth for the 10 year period between 2025 and 2035 (i.e. 2% base increase per year for 10 years).

Tables 4.7, 4.8 and 4.9 shows the SIDRA traffic modelling results for the intersection in 2035 with a 20% increase in background traffic from 2025, together with the Project in place.

Reference to Tables 4.7 and 4.8 which show the modelling results for the intersections of Menangle Road with Woodbridge Road/Station Street and Menangle Road with Finns Road. Both intersections will continue to operate at a good Level of Service with a Level of Service B and Level of Service A, respectively, in the Site Peak Hours.

Reference to Table 4.9 which shows the modelling results for the intersection of Menangle Road/Site Entrance intersection shows that this intersection will also operate at a good Level of Service with a Level of Service A in 2035.

Extracts from the SIDRA modelling are in Appendix 1.

TABLE 4.7

SIDRA MODELLING RESULTS FOR INTERSECTION OF MENANGLE ROAD/WOODBRIDGE ROAD AND STATION STREET WITH PROJECT IN 2035

CRITERIA	2035 WITH PROJECT	
	AM	PM
LS	B	B
DS	0.340	0.295
AVD(seconds)	5.3	4.4
HMD(seconds)	18.0	19.8

Where:
LS *Level of Service*
DS *Degree of Saturation*
AVD *Average Vehicle Delay (in seconds)*
HMD *Highest Movement Delay (in seconds)*

TABLE 4.8

SIDRA MODELLING RESULTS FOR INTERSECTION OF MENANGLE ROAD/FINNS ROAD WITH PROJECT IN 2035

CRITERIA	2035 WITH PROJECT	
	AM	PM
LS	A	A
DS	0.225	0.166
AVD(seconds)	4.2	3.3
HMD(seconds)	11.1	9.9

Where:
LS *Level of Service*
DS *Degree of Saturation*
AVD *Average Vehicle Delay (in seconds)*
HMD *Highest Movement Delay (in seconds)*

TABLE 4.9

SIDRA MODELLING RESULTS FOR INTERSECTION OF MENANGLE ROAD/SITE ENTRANCE ROAD IN 2035 WITH PROJECT

CRITERIA	2035 WITH PROJECT		2035 WITH PROJECT AND INCREASED RIGHT TURN VOLUME INTO SITE	
	AM	PM	AM	PM
LS	A	A	A	A
DS	0.124	0.110	0.125	0.110
AVD(seconds)	1.1	1.6	2.5	2.9
HMD(seconds)	9.4	10.6	7.9	7.9

Where:
LS *Level of Service*
DS *Degree of Saturation*
AVD *Average Vehicle Delay (in seconds)*
HMD *Highest Movement Delay (in seconds)*

4.5 Construction Impacts

As noted in Section 2.2.4, at peak construction (a period of 6-8 weeks) up to 76 workers could be on site at the same time with up to 44 delivery vehicles per day.

Daily volumes during peak construction are estimated as 240 two way vehicle trips per day i.e. 120 in/120 out.

Outside the peak construction period, heavy vehicle deliveries would number 11-13 vehicles per day (vpd).

The construction of the vent shafts will be undertaken in shifts over 24 hours. Concrete deliveries for the vent shafts will occur 24 hours/7 days per week. Night time concrete deliveries will come from Narellan via Remembrance Driveway, Finns Road, Woodbridge Road and Menangle Road.

Other deliveries will be staggered during the day between 7.00am and 6.00pm Monday to Saturday.

For the peak construction period (6-8 weeks) deliveries will average 4 per hour, with up to 8 per hour during a busy hour.

Other than the night time concrete deliveries, the majority of heavy vehicles will access the Site from the south.

Heavy vehicles will consist of rigid trucks and semi-trailers (up to 19 metres). A number of Special Purpose Vehicles and Oversize Vehicles will deliver equipment to the Site. These vehicles will have the appropriate permits.

The majority of the workforce for the surface construction will arrive between 6.00am and 7.00am and depart between 6.00pm and 7.00pm.

Based on a vehicle occupancy of 1.0 person per vehicle for construction worker trips, the maximum hourly traffic generation during construction is estimated to be;

- 76 inbound workforce trips between 6.00am and 7.00am; and
- 76 outbound workforce trips between 6.00pm and 7.00pm.

The construction workforce trips will not coincide with the commuter AM and PM peak hours on the road network adjacent the Project site and the impacts on the roads and intersections will be less than during the operational phase of the mine.

Should the Project be approved, IMC will prepare a Construction Traffic Management Plan to manage the construction impacts of the Project including the construction of the Site Access Intersection.

4.6 Parking and Internal Roads

Car parking for 212 cars, including two accessible parking spaces, as well as provision for future additional parking will be provided on site. This provision will be adequate for employee/contractor numbers (including at shift change over times) as well as visitors to the Site.

The Wollondilly Development Control Plan does not provide a parking provision rate for mines. Therefore, the assessment has been undertaken based on employee/contractor and visitor numbers to the Site.

The shift changeover times between Shifts 1 and 2 on maintenance weekdays represents the maximum parking demand at the Site. At this time an estimated 198 cars associated with the workforce will be parked on site (116 cars from Shift 1 and 82 cars from Shift 2). Allowing for five visitors, then the total parking demand would be 203 spaces. Therefore, it is concluded that 212 formal car spaces will be adequate car parking for the Site. As noted above, provision for additional future parking will also be made.

Truck parking and loading areas will also be provided on site.

The internal roads, the truck parking and loading areas, as well as the car parking areas will be designed to AS2890.1, AS2890.2 and AS2890.6 standards as appropriate.

4.7 Pedestrians and Cyclists and Public Transport

The Project is not expected to have any negative impacts on pedestrians, cyclists and buses that use the road network adjacent the Project Site.

As noted in Sections 3.3 and 3.4 pedestrian crossing activity as well as the number of cyclists using the road are relatively small.

4.8 Road Safety

The Project is not expected to have any negative impacts on road safety. As part of the Project a channelised Site Entrance intersection will be constructed on Menangle Road. This intersection, as well as the adjacent intersections will all have adequate capacity to cater for the traffic generated by the Project.

The intersections are expected to operate at a good level of service (i.e. Level of Service A or B operation) with low vehicle delays.

5.0 CONCLUSIONS

This report documents the traffic impacts for the Appin Mine Ventilation and Access Project on Menangle Road in Menangle.

The Project involves the construction and operation of Ventilation Shafts 7 and 8, together with mine access facilities and associated infrastructure, including car parking and access roads.

As part of the Project a new Site Entrance intersection will be constructed in Menangle Road north of Finns Road. The intersection will include a left turn auxiliary lane and a right turn bay (CHR treatment) in Menangle Road for left and right turns into the site access. The intersection will be designed and constructed to Austroads Standards.

Once operational in 2025 the worst case day from a traffic perspective would be when up to 308 personnel will access the mine site on a maintenance weekday (1 day per week) over 3 shifts per day. A significant proportion of this workforce will be existing employees/contractors who currently access the mine via a different site.

Heavy vehicles associated with deliveries and maintenance in the operational phase are expected to number 12 trucks per day (12 in/12 out) and will typically be rigid trucks and 19 metre articulated vehicles. A significant proportion of these heavy vehicles associated with the mine operations, are existing heavy vehicles that currently travel to and from a different site.

The assessment of the traffic impacts including the cumulative impacts in the operational phase has found that the traffic impacts will be satisfactory with the Site Entrance intersection as well as the adjacent intersections on the road network all operating at a good level of service, with the Project in place.

The Project will have sufficient car parking to accommodate the maximum parking demand of employees/contractors and visitors at shift changeover times, on maintenance weekdays.

The internal roads and car parking will be designed and constructed to AS2890.1, AS2890.2 and AS2890.6 standards as appropriate.

Following approval, IMC will prepare a Construction Environmental Management Plan (CEMP) including a Traffic Management Plan to manage the impacts of the construction of site infrastructure, including the construction of the Site Access Intersection.

The Project is not expected to have any negative impacts on other road users including pedestrians, cyclists and public transport vehicles (buses) and or on road safety.

APPENDIX 1

SIDRA MODELLING EXTRACTS

MOVEMENT SUMMARY

Site: 101 [Menangle Rd, Station St, Woodbridge Rd- Ex AM (Site Folder: General)]

Ex AM
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	8	1	8	12.5	0.098	4.7	LOS A	0.0	0.1	0.00	0.02	0.00	49.2
2	T1	193	8	193	4.1	0.098	0.0	LOS A	0.0	0.1	0.00	0.02	0.00	49.9
3	R2	1	0	1	0.0	0.098	4.8	LOS A	0.0	0.1	0.00	0.02	0.00	49.5
Approach		202	9	202	4.5	0.098	0.2	NA	0.0	0.1	0.00	0.02	0.00	49.8
East: Station St														
4	L2	4	1	4	25.0	0.047	8.7	LOS A	0.2	1.2	0.34	0.95	0.34	43.0
5	T1	5	0	5	0.0	0.047	9.1	LOS A	0.2	1.2	0.34	0.95	0.34	43.3
6	R2	17	2	17	11.8	0.047	13.3	LOS A	0.2	1.2	0.34	0.95	0.34	43.3
Approach		26	3	26	11.5	0.047	11.7	LOS A	0.2	1.2	0.34	0.95	0.34	43.2
North: Menangle Rd														
7	L2	10	4	10	40.0	0.080	5.5	LOS A	0.4	2.8	0.29	0.30	0.29	46.5
8	T1	58	6	58	10.3	0.080	0.5	LOS A	0.4	2.8	0.29	0.30	0.29	47.5
9	R2	68	0	68	0.0	0.080	5.2	LOS A	0.4	2.8	0.29	0.30	0.29	47.2
Approach		136	10	136	7.4	0.080	3.2	NA	0.4	2.8	0.29	0.30	0.29	47.2
West: Woodbridge Rd														
10	L2	256	8	256	3.1	0.233	8.5	LOS A	1.0	7.6	0.35	0.88	0.35	44.8
11	T1	3	0	3	0.0	0.233	9.6	LOS A	1.0	7.6	0.35	0.88	0.35	44.7
12	R2	5	2	5	40.0	0.233	13.2	LOS A	1.0	7.6	0.35	0.88	0.35	44.4
Approach		264	10	264	3.8	0.233	8.6	LOS A	1.0	7.6	0.35	0.88	0.35	44.8
All Vehicles		628	32	628	5.1	0.233	4.9	NA	1.0	7.6	0.23	0.48	0.23	46.7

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 15 April 2021 10:45:07 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

Site: 101 [Menangle Rd, Station St, Woodbridge Rd- Ex PM (Site Folder: General)]

Ex PM
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	9	1	9	11.1	0.054	4.8	LOS A	0.0	0.3	0.03	0.06	0.03	48.9
2	T1	95	6	95	6.3	0.054	0.0	LOS A	0.0	0.3	0.03	0.06	0.03	49.5
3	R2	4	0	4	0.0	0.054	5.1	LOS A	0.0	0.3	0.03	0.06	0.03	49.2
Approach		108	7	108	6.5	0.054	0.6	NA	0.0	0.3	0.03	0.06	0.03	49.5
East: Station St														
4	L2	10	2	10	20.0	0.040	8.9	LOS A	0.1	1.1	0.39	0.92	0.39	43.4
5	T1	5	0	5	0.0	0.040	10.3	LOS A	0.1	1.1	0.39	0.92	0.39	43.6
6	R2	10	2	10	20.0	0.040	14.1	LOS A	0.1	1.1	0.39	0.92	0.39	43.5
Approach		25	4	25	16.0	0.040	11.3	LOS A	0.1	1.1	0.39	0.92	0.39	43.5
North: Menangle Rd														
7	L2	11	1	11	9.1	0.217	5.1	LOS A	1.2	8.7	0.23	0.30	0.23	47.0
8	T1	154	15	154	9.7	0.217	0.3	LOS A	1.2	8.7	0.23	0.30	0.23	47.6
9	R2	210	13	210	6.2	0.217	5.0	LOS A	1.2	8.7	0.23	0.30	0.23	47.2
Approach		375	29	375	7.7	0.217	3.1	NA	1.2	8.7	0.23	0.30	0.23	47.3
West: Woodbridge Rd														
10	L2	92	4	92	4.3	0.106	8.0	LOS A	0.4	3.0	0.21	0.91	0.21	44.6
11	T1	5	0	5	0.0	0.106	10.6	LOS A	0.4	3.0	0.21	0.91	0.21	44.6
12	R2	15	0	15	0.0	0.106	11.7	LOS A	0.4	3.0	0.21	0.91	0.21	44.8
Approach		112	4	112	3.6	0.106	8.6	LOS A	0.4	3.0	0.21	0.91	0.21	44.6
All Vehicles		620	44	620	7.1	0.217	4.0	NA	1.2	8.7	0.20	0.39	0.20	47.0

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 15 April 2021 10:46:57 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

Site: 101 [Menangle Rd, Station St, Woodbridge Rd- 2025 AM Proposal (Site Folder: General)]

2025 AM with Proposal
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	10	2	10	20.0	0.112	4.8	LOS A	0.0	0.2	0.01	0.03	0.01	49.0
2	T1	217	9	217	4.1	0.112	0.0	LOS A	0.0	0.2	0.01	0.03	0.01	49.8
3	R2	3	0	3	0.0	0.112	4.8	LOS A	0.0	0.2	0.01	0.03	0.01	49.5
Approach		230	11	230	4.8	0.112	0.3	NA	0.0	0.2	0.01	0.03	0.01	49.8
East: Station St														
4	L2	5	2	5	40.0	0.062	9.3	LOS A	0.2	1.6	0.39	0.97	0.39	42.4
5	T1	6	0	6	0.0	0.062	9.5	LOS A	0.2	1.6	0.39	0.97	0.39	42.8
6	R2	19	3	19	15.8	0.062	15.0	LOS B	0.2	1.6	0.39	0.97	0.39	42.8
Approach		30	5	30	16.7	0.062	13.0	LOS A	0.2	1.6	0.39	0.97	0.39	42.7
North: Menangle Rd														
7	L2	13	6	13	46.2	0.100	5.7	LOS A	0.5	3.6	0.31	0.31	0.31	46.3
8	T1	72	8	72	11.1	0.100	0.6	LOS A	0.5	3.6	0.31	0.31	0.31	47.4
9	R2	83	0	83	0.0	0.100	5.3	LOS A	0.5	3.6	0.31	0.31	0.31	47.1
Approach		168	14	168	8.3	0.100	3.3	NA	0.5	3.6	0.31	0.31	0.31	47.2
West: Woodbridge Rd														
10	L2	282	9	282	3.2	0.267	8.7	LOS A	1.2	8.9	0.39	0.89	0.39	44.7
11	T1	4	0	4	0.0	0.267	10.2	LOS A	1.2	8.9	0.39	0.89	0.39	44.7
12	R2	6	3	6	50.0	0.267	15.3	LOS B	1.2	8.9	0.39	0.89	0.39	44.2
Approach		292	12	292	4.1	0.267	8.9	LOS A	1.2	8.9	0.39	0.89	0.39	44.7
All Vehicles		720	42	720	5.8	0.267	5.0	NA	1.2	8.9	0.25	0.48	0.25	46.7

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 15 April 2021 11:09:10 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

Site: 101 [Menangle Rd, Station St, Woodbridge Rd- 2025 PM Proposal (Site Folder: General)]

2025 PM with Proposal
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	10	2	10	20.0	0.066	5.0	LOS A	0.1	0.4	0.04	0.06	0.04	48.7
2	T1	116	7	116	6.0	0.066	0.0	LOS A	0.1	0.4	0.04	0.06	0.04	49.5
3	R2	6	0	6	0.0	0.066	5.2	LOS A	0.1	0.4	0.04	0.06	0.04	49.2
Approach		132	9	132	6.8	0.066	0.7	NA	0.1	0.4	0.04	0.06	0.04	49.4
East: Station St														
4	L2	11	3	11	27.3	0.052	9.4	LOS A	0.2	1.4	0.43	0.94	0.43	42.9
5	T1	6	0	6	0.0	0.052	10.9	LOS A	0.2	1.4	0.43	0.94	0.43	43.2
6	R2	11	3	11	27.3	0.052	16.3	LOS B	0.2	1.4	0.43	0.94	0.43	43.0
Approach		28	6	28	21.4	0.052	12.4	LOS A	0.2	1.4	0.43	0.94	0.43	43.0
North: Menangle Rd														
7	L2	12	2	12	16.7	0.242	5.2	LOS A	1.3	10.1	0.27	0.31	0.27	46.8
8	T1	170	17	170	10.0	0.242	0.4	LOS A	1.3	10.1	0.27	0.31	0.27	47.5
9	R2	231	15	231	6.5	0.242	5.1	LOS A	1.3	10.1	0.27	0.31	0.27	47.1
Approach		413	34	413	8.2	0.242	3.2	NA	1.3	10.1	0.27	0.31	0.27	47.3
West: Woodbridge Rd														
10	L2	101	5	101	5.0	0.124	8.1	LOS A	0.5	3.5	0.25	0.91	0.25	44.5
11	T1	6	0	6	0.0	0.124	11.3	LOS A	0.5	3.5	0.25	0.91	0.25	44.5
12	R2	17	0	17	0.0	0.124	12.6	LOS A	0.5	3.5	0.25	0.91	0.25	44.7
Approach		124	5	124	4.0	0.124	8.9	LOS A	0.5	3.5	0.25	0.91	0.25	44.5
All Vehicles		697	54	697	7.7	0.242	4.1	NA	1.3	10.1	0.23	0.39	0.23	46.9

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.

MOVEMENT SUMMARY

Site: 101 [Menangle Rd, Station St, Woodbridge Rd- 2035 AM Proposal (Site Folder: General)]

2035 AM with Proposal
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	12	3	12	25.0	0.135	4.9	LOS A	0.0	0.3	0.01	0.03	0.01	48.9
2	T1	260	10	260	3.8	0.135	0.0	LOS A	0.0	0.3	0.01	0.03	0.01	49.8
3	R2	4	0	4	0.0	0.135	4.9	LOS A	0.0	0.3	0.01	0.03	0.01	49.5
Approach		276	13	276	4.7	0.135	0.3	NA	0.0	0.3	0.01	0.03	0.01	49.8
East: Station St														
4	L2	7	3	7	42.9	0.093	9.6	LOS A	0.3	2.5	0.44	0.97	0.44	41.5
5	T1	8	0	8	0.0	0.093	10.2	LOS A	0.3	2.5	0.44	0.97	0.44	42.0
6	R2	23	4	23	17.4	0.093	18.0	LOS B	0.3	2.5	0.44	0.97	0.44	41.9
Approach		38	7	38	18.4	0.093	14.8	LOS B	0.3	2.5	0.44	0.97	0.44	41.9
North: Menangle Rd														
7	L2	16	7	16	43.8	0.124	5.9	LOS A	0.6	4.6	0.35	0.32	0.35	46.2
8	T1	86	9	86	10.5	0.124	0.8	LOS A	0.6	4.6	0.35	0.32	0.35	47.3
9	R2	100	0	100	0.0	0.124	5.6	LOS A	0.6	4.6	0.35	0.32	0.35	47.0
Approach		202	16	202	7.9	0.124	3.6	NA	0.6	4.6	0.35	0.32	0.35	47.1
West: Woodbridge Rd														
10	L2	338	11	338	3.3	0.340	9.1	LOS A	1.6	11.8	0.45	0.90	0.45	44.5
11	T1	5	0	5	0.0	0.340	11.3	LOS A	1.6	11.8	0.45	0.90	0.45	44.5
12	R2	8	4	8	50.0	0.340	17.7	LOS B	1.6	11.8	0.45	0.90	0.45	44.0
Approach		351	15	351	4.3	0.340	9.3	LOS A	1.6	11.8	0.45	0.90	0.45	44.5
All Vehicles		867	51	867	5.9	0.340	5.3	NA	1.6	11.8	0.29	0.49	0.29	46.5

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.

MOVEMENT SUMMARY

Site: 101 [Menangle Rd, Station St, Woodbridge Rd- 2035 PM Proposal (Site Folder: General)]

2035 PM with Proposal
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	12	3	12	25.0	0.080	5.1	LOS A	0.1	0.6	0.05	0.07	0.05	48.6
2	T1	139	8	139	5.8	0.080	0.1	LOS A	0.1	0.6	0.05	0.07	0.05	49.5
3	R2	8	0	8	0.0	0.080	5.3	LOS A	0.1	0.6	0.05	0.07	0.05	49.1
Approach		159	11	159	6.9	0.080	0.7	NA	0.1	0.6	0.05	0.07	0.05	49.4
East: Station St														
4	L2	13	4	13	30.8	0.080	9.7	LOS A	0.3	2.2	0.50	0.95	0.50	42.0
5	T1	8	0	8	0.0	0.080	12.2	LOS A	0.3	2.2	0.50	0.95	0.50	42.3
6	R2	14	4	14	28.6	0.080	19.8	LOS B	0.3	2.2	0.50	0.95	0.50	42.2
Approach		35	8	35	22.9	0.080	14.3	LOS A	0.3	2.2	0.50	0.95	0.50	42.2
North: Menangle Rd														
7	L2	15	3	15	20.0	0.295	5.4	LOS A	1.7	12.9	0.31	0.31	0.31	46.7
8	T1	204	19	204	9.3	0.295	0.6	LOS A	1.7	12.9	0.31	0.31	0.31	47.4
9	R2	277	17	277	6.1	0.295	5.3	LOS A	1.7	12.9	0.31	0.31	0.31	47.0
Approach		496	39	496	7.9	0.295	3.4	NA	1.7	12.9	0.31	0.31	0.31	47.1
West: Woodbridge Rd														
10	L2	121	6	121	5.0	0.159	8.3	LOS A	0.6	4.6	0.29	0.90	0.29	44.3
11	T1	8	0	8	0.0	0.159	12.9	LOS A	0.6	4.6	0.29	0.90	0.29	44.3
12	R2	19	0	19	0.0	0.159	14.5	LOS B	0.6	4.6	0.29	0.90	0.29	44.5
Approach		148	6	148	4.1	0.159	9.3	LOS A	0.6	4.6	0.29	0.90	0.29	44.3
All Vehicles		838	64	838	7.6	0.295	4.4	NA	1.7	12.9	0.27	0.40	0.27	46.8

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:28:12 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Menangle Rd & Finns Rd-Ex AM (Site Folder: General)]

Ex AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	134	10	134	7.5	0.144	7.1	LOS A	0.0	0.0	0.00	0.30	0.00	67.2
2	T1	152	8	152	5.3	0.144	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	74.7
Approach		286	18	286	6.3	0.144	3.3	NA	0.0	0.0	0.00	0.30	0.00	71.0
North: Menangle Rd														
8	T1	56	6	56	10.7	0.032	0.2	LOS A	0.0	0.3	0.06	0.03	0.06	79.2
9	R2	3	2	3	66.7	0.032	10.0	LOS A	0.0	0.3	0.06	0.03	0.06	53.1
Approach		59	8	59	13.6	0.032	0.7	NA	0.0	0.3	0.06	0.03	0.06	77.3
West: Finns Rd														
10	L2	29	4	29	13.8	0.142	7.8	LOS A	0.5	3.7	0.32	0.66	0.32	59.7
12	R2	116	5	116	4.3	0.142	8.2	LOS A	0.5	3.7	0.32	0.66	0.32	62.5
Approach		145	9	145	6.2	0.142	8.1	LOS A	0.5	3.7	0.32	0.66	0.32	61.9
All Vehicles		490	35	490	7.1	0.144	4.4	NA	0.5	3.7	0.10	0.38	0.10	68.7

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 15 April 2021 10:38:34 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Menangle Rd & Finns Rd-Ex PM (Site Folder: General)]

Ex PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	116	8	116	6.9	0.097	7.1	LOS A	0.0	0.0	0.00	0.39	0.00	66.2
2	T1	75	5	75	6.7	0.097	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	73.2
Approach		191	13	191	6.8	0.097	4.3	NA	0.0	0.0	0.00	0.39	0.00	68.8
North: Menangle Rd														
8	T1	120	12	120	10.0	0.078	0.2	LOS A	0.2	1.4	0.12	0.11	0.12	77.1
9	R2	24	3	24	12.5	0.078	8.0	LOS A	0.2	1.4	0.12	0.11	0.12	67.4
Approach		144	15	144	10.4	0.078	1.5	NA	0.2	1.4	0.12	0.11	0.12	75.3
West: Finns Rd														
10	L2	11	0	11	0.0	0.053	7.2	LOS A	0.2	1.4	0.25	0.63	0.25	64.3
12	R2	42	6	42	14.3	0.053	8.4	LOS A	0.2	1.4	0.25	0.63	0.25	59.7
Approach		53	6	53	11.3	0.053	8.1	LOS A	0.2	1.4	0.25	0.63	0.25	60.6
All Vehicles		388	34	388	8.8	0.097	3.8	NA	0.2	1.4	0.08	0.32	0.08	69.7

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 15 April 2021 10:42:12 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Menangle Rd & Finns Rd-2025 AM Proposal (Site Folder: General)]

2025 AM with Proposal
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	148	11	148	7.4	0.160	7.1	LOS A	0.0	0.0	0.00	0.30	0.00	67.2
2	T1	170	10	170	5.9	0.160	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	74.7
Approach		318	21	318	6.6	0.160	3.3	NA	0.0	0.0	0.00	0.30	0.00	71.0
North: Menangle Rd														
8	T1	141	8	141	5.7	0.075	0.1	LOS A	0.1	0.5	0.04	0.02	0.04	79.5
9	R2	4	3	4	75.0	0.075	10.7	LOS A	0.1	0.5	0.04	0.02	0.04	51.5
Approach		145	11	145	7.6	0.075	0.4	NA	0.1	0.5	0.04	0.02	0.04	78.4
West: Finns Rd														
10	L2	32	5	32	15.6	0.173	7.9	LOS A	0.6	4.6	0.38	0.70	0.38	58.8
12	R2	128	6	128	4.7	0.173	8.9	LOS A	0.6	4.6	0.38	0.70	0.38	61.9
Approach		160	11	160	6.9	0.173	8.7	LOS A	0.6	4.6	0.38	0.70	0.38	61.3
All Vehicles		623	43	623	6.9	0.173	4.0	NA	0.6	4.6	0.11	0.34	0.11	69.7

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:31:18 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Menangle Rd & Finns Rd-2025 PM Proposal (Site Folder: General)]

2025 PM with Proposal
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	128	9	128	7.0	0.108	7.1	LOS A	0.0	0.0	0.00	0.39	0.00	66.2
2	T1	84	6	84	7.1	0.108	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	73.2
Approach		212	15	212	7.1	0.108	4.3	NA	0.0	0.0	0.00	0.39	0.00	68.8
North: Menangle Rd														
8	T1	241	15	241	6.2	0.139	0.1	LOS A	0.2	1.8	0.09	0.06	0.09	78.1
9	R2	27	4	27	14.8	0.139	8.2	LOS A	0.2	1.8	0.09	0.06	0.09	67.4
Approach		268	19	268	7.1	0.139	1.0	NA	0.2	1.8	0.09	0.06	0.09	76.9
West: Finns Rd														
10	L2	11	0	11	0.0	0.068	7.2	LOS A	0.2	1.7	0.30	0.66	0.30	63.5
12	R2	47	7	47	14.9	0.068	9.2	LOS A	0.2	1.7	0.30	0.66	0.30	58.8
Approach		58	7	58	12.1	0.068	8.9	LOS A	0.2	1.7	0.30	0.66	0.30	59.6
All Vehicles		538	41	538	7.6	0.139	3.1	NA	0.2	1.8	0.08	0.26	0.08	71.4

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:37:17 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Menangle Rd & Finns Rd-2035 AM Proposal (Site Folder: General)]

2035 AM with Proposal
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	178	13	178	7.3	0.192	7.1	LOS A	0.0	0.0	0.00	0.30	0.00	67.2
2	T1	204	12	204	5.9	0.192	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	74.6
Approach		382	25	382	6.5	0.192	3.3	NA	0.0	0.0	0.00	0.30	0.00	71.0
North: Menangle Rd														
8	T1	169	10	169	5.9	0.092	0.2	LOS A	0.1	0.8	0.06	0.02	0.06	79.3
9	R2	6	4	6	66.7	0.092	11.1	LOS A	0.1	0.8	0.06	0.02	0.06	53.2
Approach		175	14	175	8.0	0.092	0.6	NA	0.1	0.8	0.06	0.02	0.06	78.0
West: Finns Rd														
10	L2	38	6	38	15.8	0.225	8.1	LOS A	0.8	6.2	0.43	0.74	0.43	58.3
12	R2	154	7	154	4.5	0.225	9.5	LOS A	0.8	6.2	0.43	0.74	0.43	61.4
Approach		192	13	192	6.8	0.225	9.2	LOS A	0.8	6.2	0.43	0.74	0.43	60.8
All Vehicles		749	52	749	6.9	0.225	4.2	NA	0.8	6.2	0.12	0.35	0.12	69.4

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.

MOVEMENT SUMMARY

▽ Site: 101 [Menangle Rd & Finns Rd-2035 PM Proposal (Site Folder: General)]

2035 PM with Proposal
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
1	L2	154	11	154	7.1	0.130	7.1	LOS A	0.0	0.0	0.00	0.39	0.00	66.1
2	T1	101	8	101	7.9	0.130	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	73.2
Approach		255	19	255	7.5	0.130	4.3	NA	0.0	0.0	0.00	0.39	0.00	68.7
North: Menangle Rd														
8	T1	283	17	283	6.0	0.166	0.2	LOS A	0.3	2.3	0.11	0.07	0.11	78.0
9	R2	33	5	33	15.2	0.166	8.5	LOS A	0.3	2.3	0.11	0.07	0.11	67.1
Approach		316	22	316	7.0	0.166	1.1	NA	0.3	2.3	0.11	0.07	0.11	76.7
West: Finns Rd														
10	L2	13	0	13	0.0	0.088	7.3	LOS A	0.3	2.3	0.34	0.69	0.34	62.9
12	R2	56	9	56	16.1	0.088	9.9	LOS A	0.3	2.3	0.34	0.69	0.34	58.0
Approach		69	9	69	13.0	0.088	9.4	LOS A	0.3	2.3	0.34	0.69	0.34	58.9
All Vehicles		640	50	640	7.8	0.166	3.3	NA	0.3	2.3	0.09	0.26	0.09	71.1

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:38:07 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Meanagle Rd & Site Access 2025 AM (Site Folder: General)]

2025 AM Peak Mine Operations
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
2	T1	200	14	200	7.0	0.103	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
3	R2	1	1	1	100.0	0.001	9.3	LOS A	0.0	0.1	0.20	0.57	0.20	50.5
Approach		201	15	201	7.5	0.103	0.1	NA	0.0	0.1	0.00	0.00	0.00	79.7
East: Site Access Rd														
4	L2	77	1	77	1.3	0.062	4.8	LOS A	0.2	1.6	0.16	0.51	0.16	53.4
6	R2	6	0	6	0.0	0.008	6.4	LOS A	0.0	0.2	0.39	0.55	0.39	52.7
Approach		83	1	83	1.2	0.062	5.0	LOS A	0.2	1.6	0.18	0.51	0.18	53.3
North: Menangle Rd														
7	L2	1	0	1	0.0	0.001	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
8	T1	66	10	66	15.2	0.037	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		67	10	67	14.9	0.037	0.1	NA	0.0	0.0	0.00	0.01	0.00	79.7
All Vehicles		351	26	351	7.4	0.103	1.2	NA	0.2	1.6	0.04	0.12	0.04	71.4

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:41:07 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Meanagle Rd & Site Access 2025 PM (Site Folder: General)]

2025 PM Peak Mine Operations
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
2	T1	94	13	94	13.8	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
3	R2	1	1	1	100.0	0.001	10.2	LOS A	0.0	0.1	0.34	0.56	0.34	50.0
Approach		95	14	95	14.7	0.051	0.1	NA	0.0	0.1	0.00	0.01	0.00	79.5
East: Site Access Rd														
4	L2	109	1	109	0.9	0.097	5.3	LOS A	0.4	2.5	0.28	0.54	0.28	53.1
6	R2	8	0	8	0.0	0.010	6.4	LOS A	0.0	0.3	0.39	0.56	0.39	52.7
Approach		117	1	117	0.9	0.097	5.4	LOS A	0.4	2.5	0.29	0.54	0.29	53.1
North: Menangle Rd														
7	L2	1	0	1	0.0	0.001	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
8	T1	169	18	169	10.7	0.092	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach		170	18	170	10.6	0.092	0.1	NA	0.0	0.0	0.00	0.00	0.00	79.8
All Vehicles		382	33	382	8.6	0.097	1.7	NA	0.4	2.5	0.09	0.17	0.09	69.1

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:55:18 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Meanagle Rd & Site Access 2035 AM (Site Folder: General)]

2035 AM Peak Mine Operations
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
2	T1	240	16	240	6.7	0.124	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
3	R2	1	1	1	100.0	0.001	9.4	LOS A	0.0	0.1	0.23	0.56	0.23	50.4
Approach		241	17	241	7.1	0.124	0.1	NA	0.0	0.1	0.00	0.00	0.00	79.7
East: Site Access Rd														
4	L2	77	1	77	1.3	0.063	4.9	LOS A	0.2	1.6	0.18	0.51	0.18	53.3
6	R2	6	0	6	0.0	0.008	6.9	LOS A	0.0	0.2	0.43	0.57	0.43	52.3
Approach		83	1	83	1.2	0.063	5.0	LOS A	0.2	1.6	0.20	0.51	0.20	53.3
North: Menangle Rd														
7	L2	1	0	1	0.0	0.001	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
8	T1	79	12	79	15.2	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		80	12	80	15.0	0.044	0.1	NA	0.0	0.0	0.00	0.01	0.00	79.8
All Vehicles		404	30	404	7.4	0.124	1.1	NA	0.2	1.6	0.04	0.11	0.04	72.3

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:42:08 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Meanagle Rd & Site Access 2035 PM (Site Folder: General)]

2035 PM Peak Mine Operations
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
2	T1	113	15	113	13.3	0.061	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
3	R2	1	1	1	100.0	0.001	10.6	LOS A	0.0	0.1	0.38	0.57	0.38	49.9
Approach		114	16	114	14.0	0.061	0.1	NA	0.0	0.1	0.00	0.01	0.00	79.5
East: Site Access Rd														
4	L2	109	1	109	0.9	0.101	5.5	LOS A	0.4	2.6	0.31	0.56	0.31	53.0
6	R2	8	0	8	0.0	0.011	6.9	LOS A	0.0	0.3	0.43	0.58	0.43	52.3
Approach		117	1	117	0.9	0.101	5.6	LOS A	0.4	2.6	0.32	0.56	0.32	53.0
North: Menangle Rd														
7	L2	1	0	1	0.0	0.001	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
8	T1	203	20	203	9.9	0.110	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach		204	20	204	9.8	0.110	0.1	NA	0.0	0.0	0.00	0.00	0.00	79.9
All Vehicles		435	37	435	8.5	0.110	1.6	NA	0.4	2.6	0.09	0.15	0.09	70.2

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:56:21 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Meanagle Rd & Site Access 2025 AMRT (Site Folder: General)]

2025 AM Peak Mine Operations with Increased Right Turn Volumes
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
2	T1	200	14	200	7.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
3	R2	109	1	109	0.9	0.082	7.2	LOS A	0.3	2.4	0.18	0.59	0.18	54.0
Approach		309	15	309	4.9	0.104	2.6	NA	0.3	2.4	0.06	0.21	0.06	68.4
East: Site Access Rd														
4	L2	77	1	77	1.3	0.062	4.8	LOS A	0.2	1.6	0.16	0.51	0.16	53.4
6	R2	6	0	6	0.0	0.009	7.3	LOS A	0.0	0.2	0.46	0.59	0.46	52.0
Approach		83	1	83	1.2	0.062	5.0	LOS A	0.2	1.6	0.18	0.51	0.18	53.3
North: Menangle Rd														
7	L2	8	0	8	0.0	0.004	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
8	T1	66	10	66	15.2	0.037	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		74	10	74	13.5	0.037	0.8	NA	0.0	0.0	0.00	0.07	0.00	78.1
All Vehicles		466	26	466	5.6	0.104	2.7	NA	0.3	2.4	0.07	0.24	0.07	66.3

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:48:51 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Meanagle Rd & Site Access 2025 PMRT (Site Folder: General)]

2025 PM Peak Mine Operations with Increased Right Turn
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
2	T1	94	13	94	13.8	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
3	R2	109	1	109	0.9	0.091	7.7	LOS A	0.4	2.6	0.30	0.61	0.30	53.6
Approach		203	14	203	6.9	0.091	4.1	NA	0.4	2.6	0.16	0.33	0.16	63.3
East: Site Access Rd														
4	L2	109	1	109	0.9	0.097	5.3	LOS A	0.4	2.5	0.28	0.54	0.28	53.1
6	R2	8	0	8	0.0	0.012	7.3	LOS A	0.0	0.3	0.46	0.60	0.46	52.0
Approach		117	1	117	0.9	0.097	5.4	LOS A	0.4	2.5	0.29	0.55	0.29	53.0
North: Menangle Rd														
7	L2	8	0	8	0.0	0.004	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
8	T1	169	18	169	10.7	0.092	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach		177	18	177	10.2	0.092	0.3	NA	0.0	0.0	0.00	0.03	0.00	79.2
All Vehicles		497	33	497	6.6	0.097	3.1	NA	0.4	2.6	0.13	0.27	0.13	64.9

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:57:35 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Meanagle Rd & Site Access 2035 AMRT (Site Folder: General)]

2035 AM Peak Mine Operations with Increased Right Turn Volumes
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
2	T1	240	16	240	6.7	0.125	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
3	R2	109	1	109	0.9	0.083	7.3	LOS A	0.3	2.4	0.20	0.59	0.20	53.9
Approach		349	17	349	4.9	0.125	2.3	NA	0.3	2.4	0.06	0.18	0.06	69.5
East: Site Access Rd														
4	L2	77	1	77	1.3	0.063	4.9	LOS A	0.2	1.6	0.18	0.51	0.18	53.3
6	R2	6	0	6	0.0	0.010	7.9	LOS A	0.0	0.2	0.50	0.61	0.50	51.6
Approach		83	1	83	1.2	0.063	5.1	LOS A	0.2	1.6	0.20	0.52	0.20	53.2
North: Menangle Rd														
7	L2	8	0	8	0.0	0.004	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
8	T1	79	12	79	15.2	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		87	12	87	13.8	0.044	0.6	NA	0.0	0.0	0.00	0.06	0.00	78.4
All Vehicles		519	30	519	5.8	0.125	2.5	NA	0.3	2.4	0.07	0.22	0.07	67.5

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:49:56 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Meanagle Rd & Site Access 2035 PMRT (Site Folder: General)]

2035 PM Peak Mine Operations with Increased Right Turn
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Menangle Rd														
2	T1	113	15	113	13.3	0.061	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
3	R2	109	1	109	0.9	0.094	7.8	LOS A	0.4	2.7	0.33	0.63	0.33	53.5
Approach		222	16	222	7.2	0.094	3.9	NA	0.4	2.7	0.16	0.31	0.16	64.3
East: Site Access Rd														
4	L2	109	1	109	0.9	0.101	5.5	LOS A	0.4	2.6	0.31	0.56	0.31	53.0
6	R2	8	0	8	0.0	0.013	7.9	LOS A	0.0	0.3	0.49	0.62	0.49	51.6
Approach		117	1	117	0.9	0.101	5.6	LOS A	0.4	2.6	0.32	0.56	0.32	52.9
North: Menangle Rd														
7	L2	8	0	8	0.0	0.004	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
8	T1	203	20	203	9.9	0.110	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach		211	20	211	9.5	0.110	0.3	NA	0.0	0.0	0.00	0.02	0.00	79.3
All Vehicles		550	37	550	6.7	0.110	2.9	NA	0.4	2.7	0.13	0.25	0.13	66.1

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.

Organisation: TRANSPORT AND URBAN PLANNING PTY LTD | Licence: NETWORK / 1PC | Processed: Wednesday, 12 May 2021 10:58:30 AM
Project: C:\Users\Terry\TransUrban Dropbox\Terry Lawrence (terry)\My PC (DESKTOP-F6FBNCR)\Documents\Version Control on Old PC \20087 South 32.sip9

2 GENERAL BUSINESS

No reports this meeting