



Calrossy Anglican School Student and Staff Number Modification



Traffic and Transport Assessment

Calrossy Anglican School

14 November 2024

→ The Power of Commitment



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1. Introduction

1.1 Background

GHD has been engaged by Calrossy Anglican School (CAS) to prepare and lodge an application with Tamworth Regional Council (Council) to modify Development Consent No. D480/01 under section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The subject site is legally known as Lot 62 DP 1278645, 242 Moore Creek Road, North Tamworth NSW 2340.

The original DA (D480/01) stipulated that the maximum permitted staff and student numbers on site were 700 students and 65 staff. Condition 2.1 enforces that this is the maximum permitted number and highlights that any changes to these numbers would require further consent from Council.

Condition 5.1 specified that a minimum provision of 35 parking spaces should be provided onsite to ensure that the provision of parking spaces is commensurate with the expected demand.

A Development Application was lodged with the Council in 2019 for the construction of the first Multi-Use Classroom (MUC1) on the eastern side of the William Cowper Campus (located at 242 Moore Creek Road, Tamworth) in order to upgrade teaching facilities for existing student numbers adjacent to the secondary school infrastructure. The educational facility was designed to complement existing facilities and was in accordance with the school's site planning process. MUC1 has been constructed and is currently operational.

In 2021, CAS implemented changes to William Cowper Campus to accommodate Year 7 to 9 students on the site. Additional teaching spaces were required to support the change, thereby justifying the construction of a second Multi-Use Classroom (MUC2) facility, consisting of a two-storey building which will provide:

- An auditorium
- Music classroom and rehearsal rooms:
- General and integrated learning centre classrooms.

The MUC2 building was approved in January 2023, and is currently under construction and is expected to commence operation in Term 1 2025.

CAS also have a second campus for Year 10 to 12 students at 140 Brisbane Street, Tamworth, approximately four kilometres to the south-east of the William Cowper Campus.

CAS are proposing to increase student and staff numbers on the William Cowper Campus to meet the growth in student enrolment and the wider population growth in Tamworth and its surrounds to a maximum of:

- 850 students
- 70 staff

This modified student/staff yield is expected to commence from term 1, 2025.

1.2 Purpose of this report

The purpose of this report is to quantify the impacts of the proposed modification to student and staff numbers on the adjoining traffic and transport networks for the CAS William Cowper Campus.

1.3 Stakeholder engagement

Based on communications with CAS representatives, the following is noted with respect to the William Cowper Campus:

- The school provides boarding facilities for students in years 7, 8 and 9.
- The current (2024) population consists of 665 students, as follows:
 - 302 primary school students.
 - 363 high school students.
- 89 high school students are boarders (25 percent of the high school population).
- Class sizes are expected to increase from 20 to 25 students in 2025.
- The volume of students that walk or cycle to school is negligible.
- The majority of students use bus services or are picked up/dropped off by a parent or guardian.
- Excluding boarders who have their own bus services, approximately 80 percent of students are bus pass holders. However, some students with bus passes are picked up/dropped off by their parent/guardian.
- It is expected that the current school bus services (refer to Section 2.5) have the capacity to accommodate the additional students associated with the modification.
- A maximum of three buses are onsite at any one time.

1.4 Subject site

CAS William Cowper Campus is located at 242 Moore Creek Road in the north-western outskirts of Tamworth, as displayed in Figure 1.1.



Figure 1.1 CAS subject site (Source: NearMaps 4 November 2024)

1.5 Scope and limitations

This report: has been prepared by GHD for Calrossy Anglican School and may only be used and relied on by Calrossy Anglican School for the purpose agreed between GHD and Calrossy Anglican School as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Calrossy Anglican School arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section 1.6 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

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1.6 Assumptions

This report is based on the following limitations:

- Traffic volumes for Moore Creek Road/Tribe Street and the school entry/exit were provided by Council.
- No intersection modelling has been undertaken.
- The analysis has been based on a future population of 850 students and 70 staff.
- Information regarding the student bus mode share was provided by CAS representatives.

The report has adopted the following assumptions:

- One in four cars accessing the kiss and drop zone will accommodate two students, i.e. siblings.
- Approximately the same number of vehicles will access and egress the CAS on a typical school day.
- All new staff members associated with the modification will drive.
- No students will walk or cycle to school.
- In accordance with the quantum of bus pass holders, 50 percent of students will utilise bus services to access/egress CAS.
- For students being picked up and dropped off by a parent or guardian, it has been assumed that:
 - 80 percent of vehicles will access/egress the school from the south.
 - 20 percent of vehicles will access the school from the north.

2. Existing situation

2.1 Current operation

The William Cowper Campus has an area of approximately 18.6 hectares and provides:

- An administration building
- Primary and secondary school classrooms
- Library and amenities building
- An assembly hall
- Sporting fields, hard surface basketball/tennis courts
- Car parking areas
- Internal access road.

The layout of the CAS access and parking facilities is displayed in Figure 2.1.

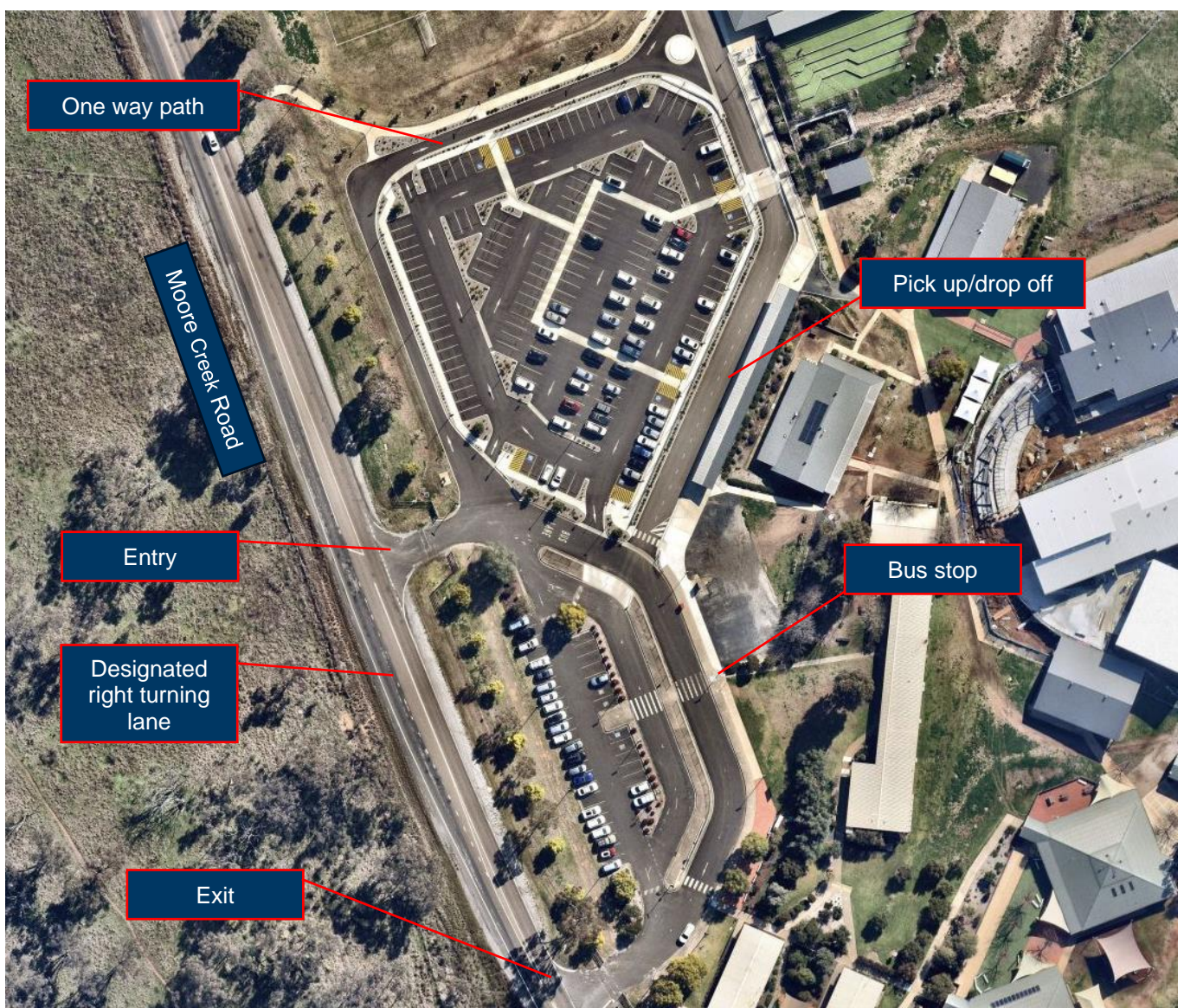


Figure 2.1 CAS access and parking facilities (Source: NearMaps 4 November 2024)

Under the current arrangement:

- The CAS operates between 8:40 am and 2:55 pm, with staff typically accessing and egressing the school before and after these times.
- A separate entry and exit is provided for all vehicles via Moore Creek Road.
- A designated right turn lane is provided for vehicles accessing CAS from the south.
- An internal bus stop is provided within the school.
- Two separate parking areas are provided:
 - A southern parking area with 36 parking spaces.
 - A northern parking area with 177 parking spaces (which was completed in 2023).
- An additional overflow parking area is also provided within the CAS.
- Parents/guardians picking up or dropping off students travel one way in a clockwise direction around the northern car park to the designated collection area.
- Male boarders reside in Simpson House (located approximately two kilometres south of CAS) and female boarders reside at the Brisbane Street campus.
- CAS provide buses to transfer boarders to and from the William Cowper Campus.

Prior to the construction of the new car park, all pick up and drop off was undertaken on the internal roads to the south of the subject site. The updated arrangement was implemented in 2023 and, based upon feedback provided by CAS representatives, has resulted in an improvement in the safety and efficiency of vehicle movements within the school.

2.2 Functional hierarchy

2.2.1 Description

Functional road classification involves the relative balance of mobility and access functions. Transport for NSW (TfNSW) defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility to high accessibility and low mobility. These road classes are:

- **Arterial Roads:** generally controlled by TfNSW. They typically have no limit in flow and are designed to carry vehicles long distances between regional centres.
- **Sub-Arterial Roads:** can be managed by either TfNSW or the local Council. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub-region or provide connectivity from arterial road routes (regional links).
- **Collector Roads:** provide connectivity between local roads and the arterial road network and typically carry between 2,000 and 10,000 vehicles per day.
- **Local Roads:** provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.2.2 Moore Creek Road

Moore Creek Road (refer to Figure 2.2) is a collector road that connects the northern residential areas of Tamworth to the Tamworth City Centre. Approximately one kilometre south of the school the name of Moore Creek Road changes to Tribe Street.



Figure 2.2 Upper Moore Creek Road looking south towards CAS

The key features of Moore Creek Road are described in Table 2.1.

Table 2.1 Moore Creek Road (Tribe Street) key features

Feature	Description
Carriageway	The carriageway is sealed without kerb and gutter and a single travel lane in either direction. The road has a width of approximately seven metres, with centre line markings provided along the carriageway. A right turn deceleration lane is provided on Moore Creek Road at its intersection with the school entry driveway.
Parking	No parking is available on the road.
Speed limit	80km/h with a 40km/h School Zone at the frontage to the CAS.
Pedestrian facilities	Pedestrian facilities are not provided.
Bicycle facilities	Bicycle facilities are not provided.
Public transport	School bus services associated with the CAS operate on Moore Creek Road.
Freight route	No designated routes on TfNSW RAV map No local road limits

Information provided by the Council indicates that they are considering plans to:

- Widen Moore Creek Road to provide two travel lanes in either direction.
- Provide traffic signals at the CAS entry/exit.
- Provide a shared path on the eastern side of Moore Creek Road.

At the time of writing this report, concept designs of these upgrades are not available, and funding has not been allocated.

2.3 Crash data

A review of the crash data from the Transport for NSW Road Centre for Road Safety for the last five years (2019 – 2023) indicates that there have been no crashes on Moore Creek Road within (approximately) 1.5 kilometres of the CAS.

2.4 Active transport

There are currently no walking or cycling facilities on Moore Creek Road.

2.5 Public transport

The following school bus services operate at the CAS (William Cowper Campus):

- S101 Manilla to Tintinhull PS via Oxley Vale & Daruka – one morning service
- S108 Kootingal to Tamworth PS via Hillvue – one morning service
- S110 Kootingal Sandy Road to Oxley Vale PS via Arthur Street - one morning service
- S112 East Tamworth to Tamworth PS via Calala - one morning service
- S118 Butterfly Bus - Tamworth to McCarthy Catholic - one morning service
- S119 Hillvue to Peel High via North Tamworth - one morning service
- S122 South Tamworth Duri Road to Westdale PS via North Tamworth - one morning service
- S123 Oxley Vale to Tamworth West PS via Hillvue - one morning service
- S127 Werris Creek to West Tamworth via North Tamworth – one morning service
- S141 Calrossy Anglican to Manilla via East Tamworth – one morning service
- S142 Calrossy Anglican to Tamworth via Hillvue and Peel High – one afternoon service
- S149 Calrossy Anglican to Moonbi via Calala – one afternoon service
- S151 St Nicholas Primary to Calala via Oxley Vale – one afternoon service
- S159 Calrossy Anglican to Tamworth via Calala – one afternoon service
- S161 Calrossy Anglican to South Tamworth via Hillvue – one afternoon service
- S164 Calrossy Anglican to North Tamworth via Kootingal and Daruka – one afternoon service
- A165 Calrossy Anglican to Hillvue via South Tamworth – one afternoon service
- S167 St Joseph's Primary to Quirindi via Calrossy Anglican – one afternoon service

In addition to the above, buses are provided to support the movements of boarders to and from the CAS.

Accordingly, CAS is served by an extensive public transport network.

2.6 Traffic data

2.6.1 Moore Creek Road/Tribe Street

Council have provided traffic survey data for Tribe Street, approximately one kilometre to the south of the CAS, for a two-week period between 9 February 2023 and 22 February 2023. The average weekday traffic volumes for Tribe Street are displayed in Figure 2.3.

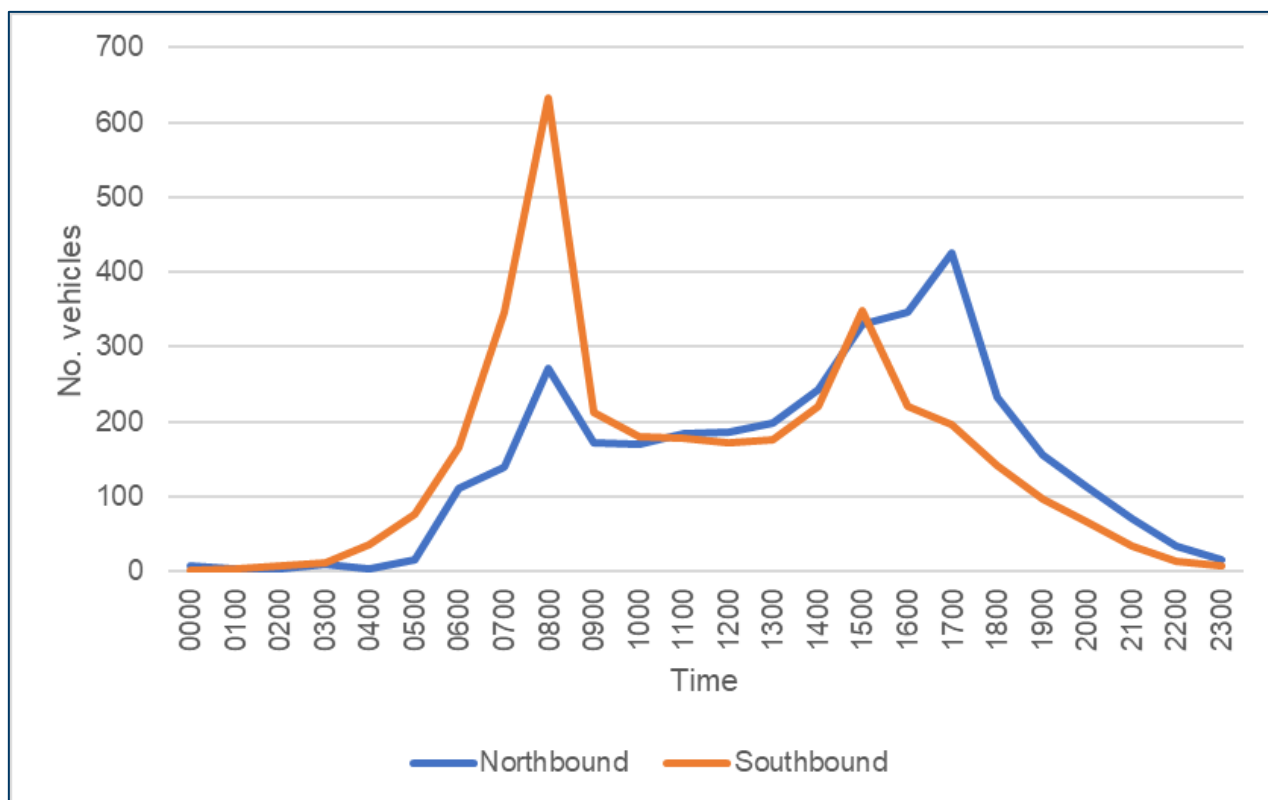


Figure 2.3 Tribe Street - average weekday traffic volumes

The data in Figure 2.3 indicates that:

- The AM peak hour occurs between 8:00 am and 9:00 am, with 272 northbound vehicles and 633 southbound vehicles.
- The PM peak occurs between 5:00 pm and 6:00 pm, with 425 northbound vehicles and 197 southbound vehicles.

These patterns are consistent with individuals using Moore Creek Road/Tribe Street to access the Tamworth City Centre in the AM peak hour and returning to their dwellings in the PM peak hour.

An additional peak occurs between 3:00 pm and 4:00 pm with 331 northbound and 348 southbound vehicles. In accordance with the data in Section 2.6.2, it is expected that this is at least partially driven by the movement of teachers and students to and from the CAS.

2.6.2 School entry/exit

Council has also provided traffic data:

- For the school entry driveway for a two-week period between 22 February 2024 and 6 March 2024.
- For the school exit driveway for a two-week period between 9 February 2023 and 22 February 2023.

Based on discussions with the CAS representatives, the 2024 counts captured peak construction vehicle activity associated with the MUC2. In accordance with the assumption that equal numbers of vehicles will access/egress the school on a daily basis, the entry data was scaled down on a pro-rata basis to reflect the exit data.

In accordance with the above, the current average weekday CAS vehicle activity is displayed in Figure 2.4.

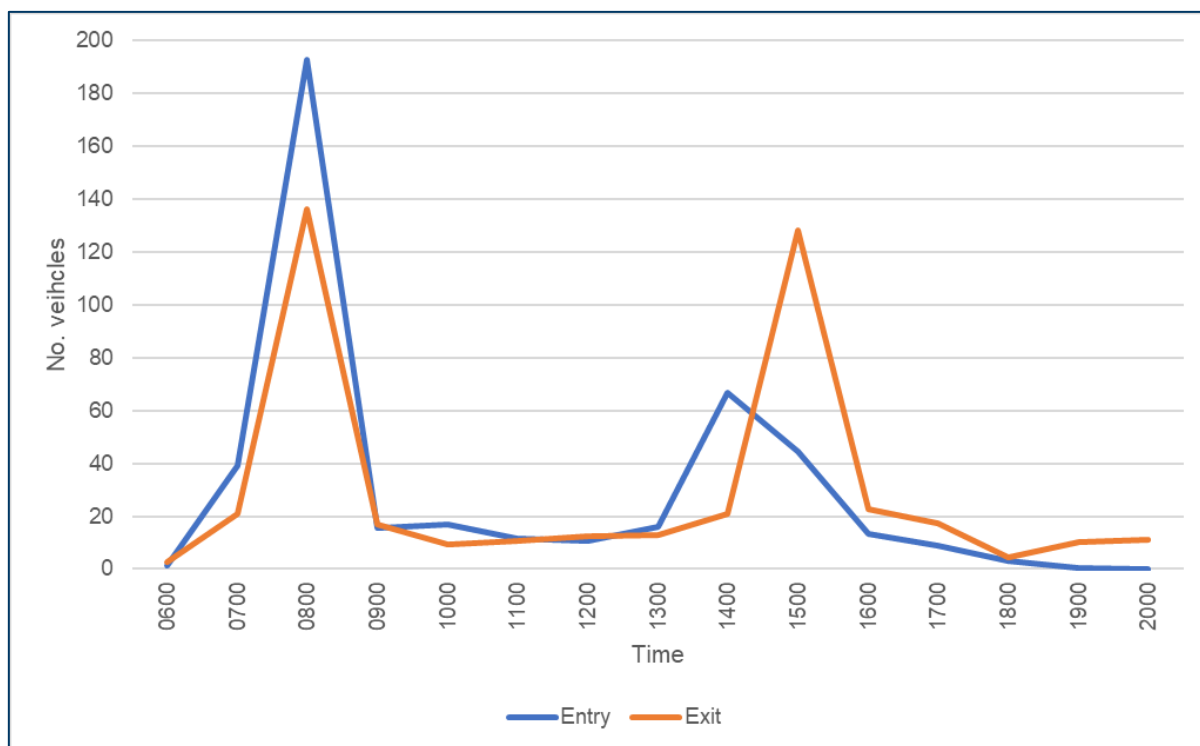


Figure 2.4 CAS average weekday vehicle activity

The data in Figure 2.4 indicates that:

- The peak morning activity occurs between 7:00 am and 9:00 am, during which time 232 vehicles enter, and 157 vehicles exit the CAS. The difference is approximately consistent with:
 - Parents/guardians entering and exiting the CAS to drop off students.
 - Teachers entering the school and parking their vehicles.
- The peak afternoon period occurs between 2:00 pm and 4:00 pm, during which time 111 vehicles enter and 157 vehicles exit the CAS. Subsequent to 4:00 pm, the majority of vehicles exit the school. This pattern is consistent with:
 - Parents/guardians entering and exiting the CAS to pick up students.
 - A longer profile of teachers exiting the CAS subsequent to students.

Additionally, the data indicates that morning vehicle activity at CAS is more intense than afternoon activity.

2.7 Mid-block assessment

Lane capacity is a measure of a road's ability to accommodate the volumes of vehicles that traverse it during peak periods of road network activity.

Austrorads Guide to Traffic Management Part 3: Transport Study and Analysis Methods (2020) outlines methodologies for determining road network capabilities for uninterrupted flow. It outlines that the typical capacity of the single lane roads within uninterrupted flow generally falls within the range of 1,500 to 2,500 passenger car units (pcu) per hour.

A road in which fixed elements influence traffic flow conditions (e.g. traffic signals, stop signs, give-way signs, roundabouts or other controls) that cause traffic to stop periodically is referred to as an interrupted flow facility. The lane capacity of a road with interrupted flow varies depending on the type of lane (Austrorads, 2020a). The typical mid-block capacity for roads with interrupted flow, stipulated by Austrorads, is provided in Table 2.2.

Table 2.2 Typical mid-block capacity for roads with interrupted flow

Type of lane	One-way mid-block capacity (pcu/hr)
Median or inner lane	
Divided road	1,000
Undivided road	900
Middle lane (of a 3 lane carriageway)	
Divided road	900
Undivided road	1,000
Kerb lane	
Adjacent to parking lane	900
Occasional parked vehicles	600
Clearway conditions	900

Source: Table 6.1, *Austroads Guide to Traffic Management Part 3 – Traffic Studies and Analysis Methods* (Austroads, 2020a)

To support a conservative analysis, 1,000 pcu per hour per lane capacity was used to calculate the Volume to Capacity Ratio (VCR) for Moore Creek Road/Tribe Street as an undivided road with clearway conditions (i.e. no parking within the road shoulders) and uninterrupted flow.

It should be noted that this mid-block capacity assumption is sustainably less than the uninterrupted flow, which is likely to be achieved in a rural single-lane environment that could be experienced on Moore Creek Road/Tribe Street.

Based upon a lane capacity of 1,000 pcu per hour per lane, the data in Figure 2.3 indicates that Moore Creek Road/Tribe Street is operating within its mid-block capacity.

In accordance with the traffic volumes displayed in Figure 2.3, Moore Creek Road has the capacity to accommodate (approximately) the following number of vehicles during peak periods:

- AM peak hour:
 - Northbound – 728 vehicles
 - Southbound – 367 vehicles
- PM peak hour:
 - Northbound - 575 vehicles
 - Southbound – 803 vehicles

This is consistent with the outputs of Google Maps, which indicates that Moore Creek Road/Tribe Street typically operates under free flow conditions during peak periods of road network activity, i.e. a weekday at 8:30 am (refer to Figure 2.5).

It is noted that the reduction in speed indicated in Figure 2.5 at the frontage of the school (displayed in orange) is associated with the operation of the 40 km/h school zone.

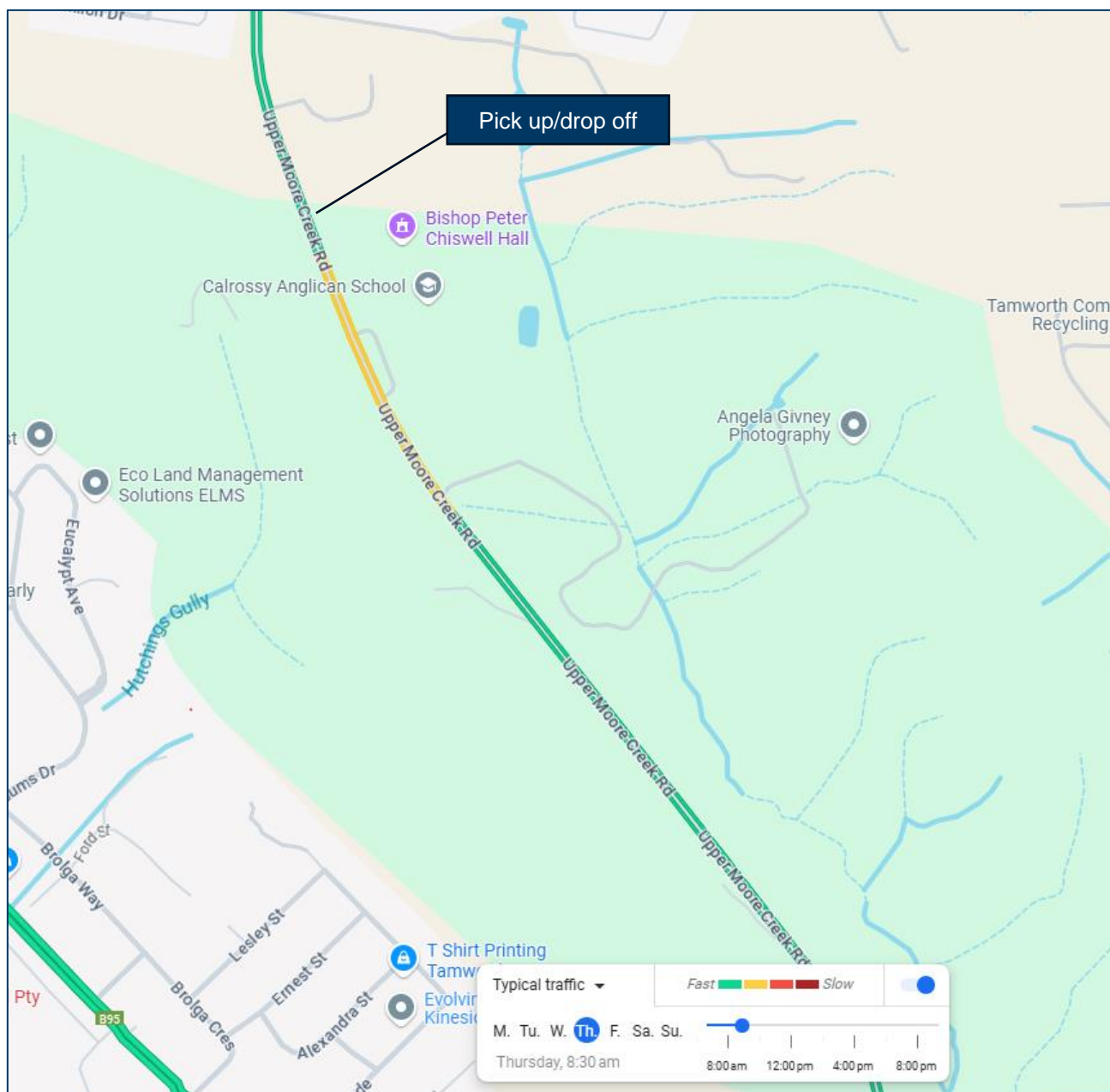


Figure 2.5 Road network operation (Source: Google Maps 2024)

3. Transport impact assessment

3.1 Trip generation

The trip generation associated with the CAS student and staff modification has been undertaken on a first principles basis, accounting for:

- An increase in staff from 65 to 70 staff (five in total).
- An increase in student population from 665 to 850 students (185 in total).

It has been assumed that all the additional teaching staff will drive to and from the CAS and will be inbound in the morning and outbound in the afternoon.

The trip generation for the increased students has been identified in accordance with the current enrolment patterns, namely:

- 83 of new students (45 percent) will be of primary school age.
- 102 of new students (55 percent) will be of high school age, of which 25 will be boarders.

Accordingly, 76 additional high school students (excluding boarders) and 84 additional primary school students will access/egress the school on a daily basis. For the purposes of analysis, it has been assumed that 50 percent of these students will use buses to access/egress the CAS, while 50 percent will be picked up by a parent/guardian. In accordance with the current mode split:

- 80 students will access/egress CAS by bus.
- 80 students will access/egress CAS by car.

Assuming an average car occupancy of 1.2 students per car, the proposed modification is expected to generate an additional 137 vehicle trips as follows:

- AM peak hour:
 - Staff: five inbound vehicle trips.
 - Students: 66 inbound and 66 outbound vehicle trips.
- PM peak hour:
 - Staff: five outbound vehicle trips.
 - Students: 66 inbound and 66 outbound vehicle trips.

3.2 Trip distribution

It is expected that the majority of trips associated with the proposed modification will access/egress the CAS to/from the south via Tamworth City Centre. Accordingly, the peak traffic impacts associated with the modification will occur on Moore Creek Road/Tribe Street south of the CAS. For the purposes of analysis, it has been assumed:

- 80 percent of the modification trips will access/egress to and from the south via Peel Street, Tribe Street and Moore Creek Road.
- 20 percent of the modification trips will access/egress to and from the south via Moore Creek Road.

Based on the above assumptions:

- In the school AM peak hour
 - 57 additional vehicles will access the subject site from the south.
 - 53 additional vehicles will egress the subject site to the south.
- In the school PM peak hour
 - 53 additional vehicles will access the subject site from the south
 - 57 additional vehicles will egress the subject site to the south.

In accordance with the trip distribution criteria, the additional traffic to and from the north is expected to be a quarter of the southbound traffic, in the order of an additional 14 per hour per lane. These volumes will have a negligible impact on the adjoining road network.

3.3 Impact Assessment

3.3.1 Impacts to road network operation

The data in Section 2.7 indicates that Moore Creek Road has sufficient capacity to accommodate additional traffic within the road network peak hour.

Accordingly, the modification of the student and staff numbers at CAS is expected to have a minor impact on the operation of the adjoining road network, which is expected to continue to operate under free flow conditions.

3.3.2 Impacts to active transport

There are no active transport facilities in proximity to the subject site.

3.3.3 Impacts to public transport

The analysis in Section 3.1 indicates that the modification will result in an additional 25 boarders and 80 day students utilising the school bus services (detailed in Section 2.5) to access/egress the CAS.

Information provided by CAS representatives indicates that the current bus services have the capacity to accommodate the expected demand.

There may be some minor delays in bus services within the school due to the interaction with the additional vehicle trips. However, the impacts of the modification on public transport services are expected to be negligible.

3.3.4 Impacts to parking

Separate parking areas are provided at CAS as follows:

- A southern parking area with 36 parking spaces.
- A northern parking area with 177 parking spaces.

Additionally, an unsealed area in the north of the school is available for use as an overflow parking area.



Figure 3.1 Overflow parking area (Source: NearMaps 4 November 2024)

Accounting for the proposed modification, up to 70 staff are expected on site. Accordingly, there is expected to be a significant oversupply of parking to accommodate short-term parking, i.e., parents/guardians visiting the school and attending larger events such as a school concert.

Further, as stated in Section 1, the original DA (D480/01) stipulated:

- A maximum permitted staff level of 65
- A minimum permitted parking supply of 35 spaces

The current parking supply is, therefore, consistent with the proposed increase in staffing associated with the proposed modification.

3.3.5 Impacts to road safety

As detailed in Section 2.3 there have been no crashes on Moore Creek Road, based on the last five years of available data.

The impacts on road safety associated with the proposed modification are expected to be negligible.

4. Summary and conclusion

GHD has been engaged by CAS to prepare and lodge an application with Council to modify Development Consent No. D480/01 under section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the site known as Lot 62 DP1278645, 242 Moore Creek Road, North Tamworth 2340.

The original DA (D480/01) stipulated that the maximum permitted staff and student numbers on site were 700, including 65 staff. Condition 2.1 enforces that this is the maximum permitted number and highlights that any changes to these numbers would require further consent from Council. CAS are proposing to increase student and staff numbers on the William Cowper Campus to meet the growth in student enrolment and the wider population growth in Tamworth and its surrounds to a maximum of:

- 850 students
- 70 staff

This modified student/staff yield is expected to commence from term 1, 2025.

Council provided traffic survey data from 2023 for Moore Creek Road/Tribe Street, which indicates that:

- The AM peak hour occurs between 8:00 am and 9:00 am, with 272 northbound vehicles and 633 southbound vehicles.
- The PM peak occurs between 5:00 pm and 6:00 pm, with 425 northbound vehicles and 197 southbound vehicles.

These patterns are consistent with individuals using Moore Creek Road/Tribe Street to access the Tamworth City Centre in the AM peak hour and returning to their dwellings in the PM peak hour.

An additional peak occurs between 3:00 pm and 4:00 pm with 331 northbound and 348 southbound vehicles. In accordance with the data in Section 2.6.2, it is expected that this is at least partially driven by the movement of teachers and students to and from the CAS.

Based upon a lane capacity of 1,000 pcu per hour per lane, the data in Figure 2.3 indicates that Moore Creek Road/Tribe Street is operating within its mid-block capacity.

The trip generation associated with the CAS student and staff modification has been undertaken on a first principles basis, accounting for:

- An increase in staff from 65 to 70 staff (five in total).
- An increase in student population from 665 to 850 students (185 in total).

Assuming an average car occupancy of 1.2 students per car, the school modification is expected to generate an additional 137 vehicle trips as follows:

- AM peak hour
 - Staff: five inbound vehicle trips.
 - Students: 66 inbound and 66 outbound vehicle trips.
- PM peak hour
 - Staff: five outbound vehicle trips.
 - Students: 66 inbound and 66 outbound vehicle trips.

The proposed modification of the student and staff numbers at CAS is expected to have a minor impact on the operation of the adjoining road network, which is expected to continue to operate under free flow conditions.

Additionally, the proposed modification is expected to have a negligible impact on active transport facilities, public transport services and road safety.

Therefore, based on the available data and the analysis undertaken in this study, the proposed modification is supported from a traffic and transport perspective.



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