T&TS TRANSPORT & TRAFFIC SOLUTIONS

Traffic Impact Assessment Report

Year 9 Centre, Emmanuel College, Warrnambool (Stage 1)

140 Botanic Road, Warrnambool

Emmanuel College

May 2024

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Description:		TIAR updated to include 15 Crawley Street into the site and the Crawley Street off-street car park updated to 19 car parking spaces.		

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1 INTRODUCTION

1.1 Background

Transport & Traffic Solutions Pty Ltd (T&TS) has updated the Masterplan Traffic Impact Assessment Report (15 December 2023, Rev C) in support of Emmanuel College's planning permit amendment application for the proposed staged expansion (four stages) of Emmanuel College located at 140 Botanic Road, Warrnambool to cater for 1,350 students and 185 employees on site at any one time (Masterplan). Refer Appendix A for a copy of this report.

T&TS has now been engaged by Emmanuel College to update the Year 9 Centre (Stage 1) Traffic Impact Assessment Report (TIAR) in support of a planning permit amendment application to construct a Year 9 Centre south of Crawley Street, two off street car parks; one adjacent to the Year 9 Centre with capacity for up to 19 car parking spaces and one over the unused courts fronting Botanic Road with capacity for up to 40 car parking spaces, and a new access point on Crawley Street for (staff, general maintenance and delivery vehicles only). All existing site access points will remain.

Since the issue of the Year 9 Centre (Stage 1) TIAR on the 29 November 2022, a Planning Permit No. PP2023-0047 and Endorsed Plan dated 13 June 2023 was issued for the construction of a new drop-off/ pick-up zone with capacity for a total of 54 car parking spaces, the western off-street car park with capacity for 124 car parking spaces, a bus parking zone, a maintenance shed, the east-west accessway and a new access point on Hopetoun Road. Construction was completed in early 2024. These works fall under Stage 1 of the college development.

Further, the 15 Crawley Street lot has since been purchased by the school and incorporated into the site as part of the off-street car park adjacent to the Year 9 Centre.

The construction of the Year 9 Centre will allow the relocation of all Year 9 students from the Rice Campus (Bromfield Street). Once the Year 9 Centre is constructed and Stage 1 of the development is completed, the college will cater for 1,300 students and 175 employees on site at any one time.

1.2 Aim of this Report

The aim of this report is to review the Emmanuel College Stage 1 Development Plan from a traffic engineering perspective and determine if adequate vehicle, pedestrian, and cyclist access has been provided to/ from the site, if the provision of car parking and bicycle facilities meets the requirements of the Warrnambool Planning Scheme, and what impact the Stage 1 expansion of the college will have on the adjacent road network.

1.3 References

The following references were used to assist in the preparation of this report:

- Department of Environment, Land, Water and Planning, VicPlan and Planning Schemes Online, State Government of Victoria, Accessed March 2022;
- Austroads Guide to Road Design, Austroads Guide to Traffic Management, Australian Standards, and the VicRoads Supplement to the Austroads Guide and Australian Standards, as detailed in this report;
- Site Plan, Emmanuel College – Edmund Rice Year 9 Centre, 140 Botanic Road, Warrnambool, Baldasso Cortese, Project No. 20210078, Dwg No. 6, Rev C, 21 December 2023; and
- Other documents as referenced within this report.

2 PROPOSED DEVELOPMENT

For details on the Existing Conditions Assessment (location and land use, site details, road network, car parking, transport and path network and casualty crash statistics) and the Background Transport Review (Warrnambool Strategic Framework Plan, Botanic Precinct Local Area Traffic Management Plan, and the Botanic Road/ Botanic Road Western Access Point intersection summary and recommendations) refer to Section 2 & 3 of the T&TS Master Plan TIAR dated 15 December 2023, Appendix A.

2.1 Development Plan

The proposed Stage 1 development consists of constructing the Year 9 Centre including 10 classrooms, shared spaces, specialist spaces and gathering areas, two new staff only off-street car parks with capacity for up to 19 car parking spaces adjacent to the Year 9 Centre and up to 40 car parking spaces over the unused courts fronting Botanic Road, and a new access point on Crawley Street for staff, general maintenance and delivery vehicles only. All existing site access points will remain.

As detailed in Section 1.1, Stage 1 of the development also includes the construction of a new off-street car park with capacity for 124 car parking spaces (74 staff spaces & 50 students) in the west of the site, a new visitor drop-off/ pick-up zone with capacity for a total of 54 car parking spaces adjacent to the Emmanuel Centre; a bus parking zone with capacity for two buses, a maintenance shed, and a new access point on Hopetoun Road (all vehicles). Construction was completed in early 2024.

The construction of the Year 9 Centre will allow the relocation of all Year 9 students from the Rice Campus (Bromfield Street). Once Stage 1 of the development is completed, the college will cater for 1,300 students and 175 employees on site at any one time. Emmanuel College operates Monday to Friday between 8:00am and 4:30pm.

Refer Figure 2.1 and Appendix B for the Proposed Stage 1 Site Plan and the Endorsed Plan.

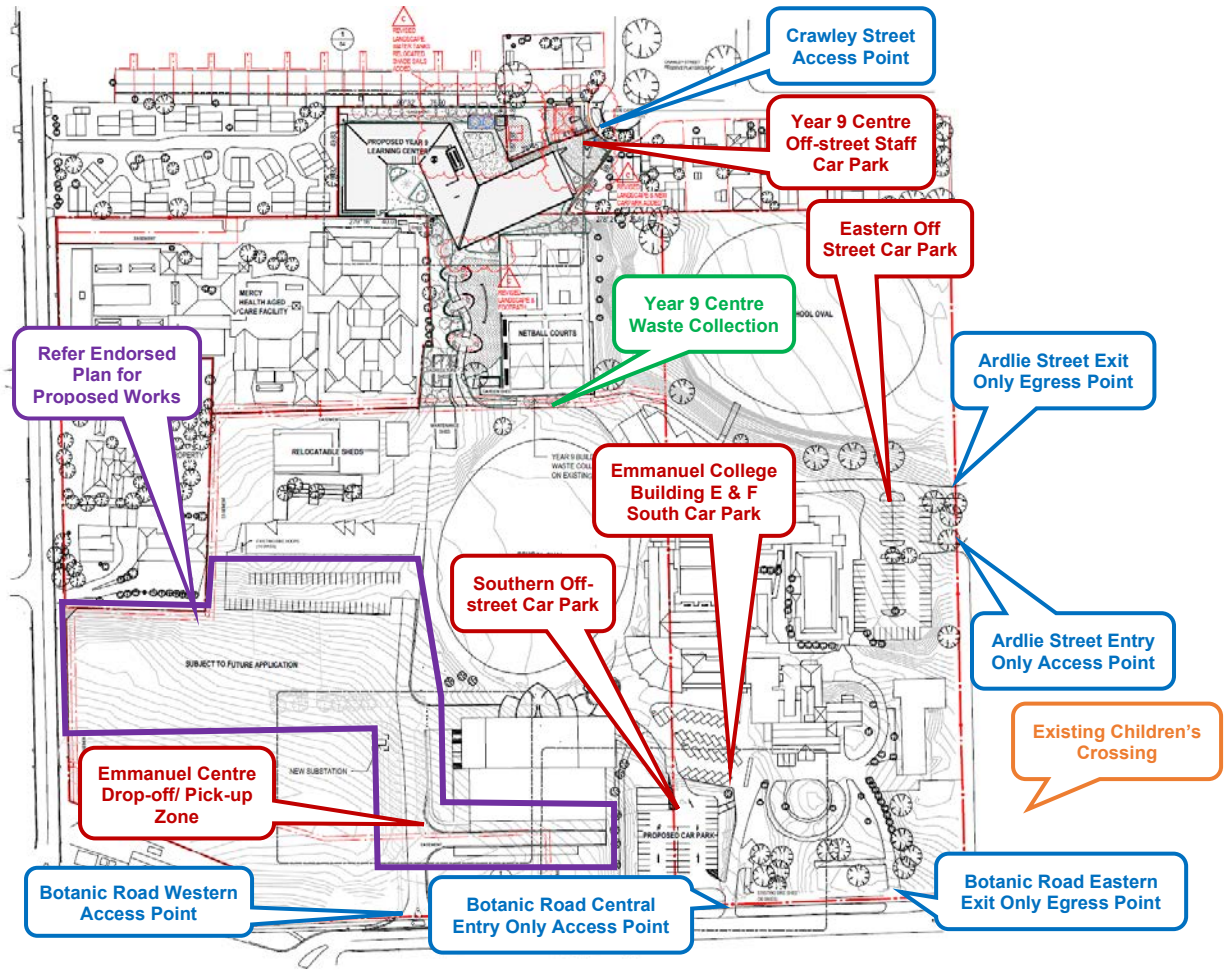

Figure 2.1: Proposed Stage 1 Site Plan

2.2 Access & On-Site Circulation

2.2.1 Vehicular Access

Vehicle access to the site is provided via the three existing access points (1 No. Ardlie Street and 2 No. Botanic Road) and two proposed new access points; one on Hopetoun Road for all vehicles and one on Crawley Street for staff, general maintenance, and delivery vehicles only. Details of the new access points are provided below.

- Hopetoun Road:

  A two-way 6.0 metre wide access point is proposed approximately 60 metres south of McPherson Crescent. This access point connects to a 6.0 metre wide east-west aligned accessway which services the new western off-street car park, two bus bays and the maintenance shed. This access point will be used by staff and students who drive to the school, maintenance and waste collection vehicles, and buses (exit only).

- Crawley Street:

  A two-way 3.3 metre wide access point is proposed at 13 Crawley Street. This access point connects to a 3.6 metre wide north-east to south-east aligned accessway which services the Year 9 Centre staff only car park.

Once stage one is constructed, the internal north-south aligned accessway from Botanic Road and the east-west aligned accessway from Hopetoun Road will connect at a turnaround area located to the north-east of the Emmanuel Centre. Vehicles accessing the drop off/ pick up zone will be required to use the turnaround area to exit the site at Botanic Road.

The western leg of the turnaround area will be restricted to buses and the odd school maintenance vehicles only (one-way westbound) and designed as a raised crossing treatment. Signage will also be provided to re-affirm that visitors are not allowed to access the east-west aligned accessway from the turnaround area. Refer Section 3.2.2 for further details on recommended signage.

The access points are to be constructed as concrete vehicle crossovers and are to match the proposed levels on Hopetoun Road and Crawley Street

2.2.2 Bus Access

Two bus parking bays (sawtooth layout) are provided within the site on the south side of the east-west aligned accessway directly west of the turnaround area. These bus bays will cater for the relocation of two existing school bus routes currently utilising the on-street bus zones and/ or an additional two new school bus routes subject to student demand.

Buses will enter the site from Botanic Road, turn left into the east-west aligned accessway at the turnaround area, and park within the bus parking bays. The bus will then exit the bus bay in a forward direction, and exit the college via Hopetoun Road.

Refer to Appendix E for the Swept Path Assessment drawing no. 22001EC-00-301 & 302 for a 12.5m long HRV (bus) entering, exiting, and circulating the college and parking within the bus parking bays.

2.2.3 Waste Collection Vehicle Access

Waste collection points are located around the college as follows:

- On the north side of the A Block building (existing).
- North of the Chapel (existing).
- South of the E Block building (existing).
- South of the Emmanuel Centre (proposed).
- South side of the Netball Courts (proposed).

Waste collection for the Year 9 Centre will occur concurrently with the existing college waste collection service. Waste bins (120L) will be placed along the internal accessway by maintenance staff prior to a waste collection vehicle arriving at the college. A waste collection vehicle will enter the college from the Botanic Road western access point, drive north along the existing north-south accessway and along the internal access track in a clock wise direction to collect and empty waste bins. The vehicle will then

exit the college via Ardlie Street (existing conditions). Refer to Appendix C for the Swept Path Assessment drawing no. 22001EC-00-302 to 304 illustrating an 8.8m long MRV entering the college and completing waste collection at the new waste collection locations.

For safety reasons, it is recommended that waste collection services occur any time prior to 8:00am, or after 4:00pm weekdays, or anytime on weekends and non-school days.

The waste collection service and the location of the waste collection points are adequate from a traffic engineering perspective.

2.2.4 Maintenance/ Delivery Vehicle Access

The existing Colourbond Shed in the north of the college is proposed to be removed and a new Maintenance Shed and hard standing area is proposed to be constructed on the north side of the east-west accessway east of the western off-street car park. The existing Maintenance Shed, Agriculture Shed and Garden Shed west of the covered netball courts will remain.

Access to the new Maintenance Shed will be provided for school maintenance vehicles only (utes, lawn mowers, etc.). School maintenance vehicles will access the maintenance shed access point via the turnaround area. These vehicles will also access the existing Maintenance Shed, Agriculture shed and Garden Shed located to the west of the netball courts via the internal access track and general deliveries will be completed at the main school building via the lower courtyard by a service vehicle (existing condition).

In the future when a longer vehicle (up to a 12.5m long HRV) is required to access the Maintenance Shed, the access point, accessway and hard standing area adjacent to the maintenance shed will be widened to cater for this vehicle.

General maintenance vehicle and delivery vehicle access to the Year 9 Centre is provided from Crawley Street. A 6.4m long SRV will drive along the north-east to south-west aligned accessway and then turn left into the car park accessway and then reverse back into the loading/ unloading area. The vehicle will then exit the college in a forward direction via Crawley Street. Refer to Appendix C for the Swept Path Assessment drawing no. 22001EC-00-304 illustrating a 6.4m long SRV entering and exiting the college site from/ to Crawley Street and circulating adjacent to the Year 9 Centre.

For safety reasons, it is recommended that maintenance/ delivery vehicle access to the site is restricted to prior to 8:00am, between 9am and 3pm, or any time after 4:00pm school days, or anytime on weekends and non-school days.

The proposed location of the access points including waste collection and maintenance vehicle access and on site circulation are adequate from a traffic engineering perspective.

2.2.5 Pedestrian & Cyclist Access & Internal Circulation

Pedestrian and cyclist access to the site is provided via the two existing access points (1 No. Ardlie Street and 1 No. Botanic Road) and two proposed new access points (1 No. Botanic Road and 1 No. Hopetoun Road). Details of the existing and new access points are provided below.

- Existing:

  Botanic Road - A 2.5 metre wide pedestrian/ cyclist access point is provided directly adjacent to the bus zone south of the Emmanuel Centre. This pedestrian/ cyclist access point connects to a 2.5m wide shared path that provides access to a student gathering area and the college buildings.

  Ardlie Street - A 2.0 metre wide gate lockable pedestrian access point is also provided on the site's eastern boundary, approximately 15 metres north of the children's crossing on Ardlie Street. This pedestrian access point provides access to the buildings on the east side of the college.

- Proposed:

  Botanic Road – A 2.5 metre wide pedestrian/ cyclist access point is provided adjacent to the Botanic Road western access point which connects to the path along the drop-off/ pick-up zone.

  Hopetoun Road – A 2.5 metre wide pedestrian/ cyclist access point is provided at the site's western boundary north of the Hopetoun Road access point. This pedestrian/ cyclist connection

will run along the southern section of the western car park, connect into the internal path network within the college and leads to the bicycle parking area.

A 1.4 metre wide and 2.5 metre wide footpath is provided on the east and west side of the proposed school drop off/ pick up spaces respectively, a 2.5 metre wide footpath is provided on the south side of the bus parking bays, and a varying width footpath is provided on the north side of the east-west aligned accessway. All proposed paths connect to the existing and proposed internal college path network and to the new Botanic Road and Hopetoun Road pedestrian and cyclist access points.

A 4.0 metre wide raised pedestrian crossing is provided directly west of the vehicle turning area. The raised pedestrian crossing provides a connection between the drop-off/ pick-up zone, the bus parking bays and the college buildings.

It is recommended that a footpath be provided on the east side of Hopetoun Road along the school frontage and connect into the existing footpath network to the north and south.

The location of all pedestrian and cyclist access points are adequate.

Further, the existing path network located external to the college allows safe and convenient access to the college via walking and cycling modes for students and residents

2.3 Parking Provisions

2.3.1 Car Parking

2.3.1.1 Off-street Car Parking

The existing Eastern Car Park and Emmanuel College Building E & F South Car Park are proposed to remain during Stage 1 of the development, however, will be designated for staff use only. The access point into these car parks will be sign posted accordingly. Details of each car park follows:

- Existing Eastern Car Park - 71 No. 90 degree angled car parking spaces including two accessible car parking spaces for disabled users.
- Emmanuel College Building E & F South Car Park - 34 No. 45 degree angled car parking spaces including one accessible car parking space for disabled users.

The existing Year 7 & 8 buildings south car park is proposed to be removed, and the existing drop-off/ pick-up area west of the Emmanuel Centre is proposed to be demolished and reconstructed with 27 No. 45 degree angled car parking spaces (12 No. car parking spaces on the east side and 15 No. car parking spaces on the west side). These car parking spaces will be signposted as a drop-off/ pick-up zone for parent/ visitor use.

The existing Emmanuel Centre south car park is proposed to be converted into a drop-off/ pick-up zone. An additional five 90 degree angled car parking spaces (two to the east and three to the west of the existing spaces) are proposed to be constructed. One parallel car parking space is also proposed on the north side of the accessway servicing this car park. A total of 27 car parking spaces will be provided for parent/ visitor use.

Three new car parks are proposed to be constructed in Stage 1 of the development. Details of each car park follows:

- Southern off-street staff car park - New staff only off-street car park with capacity for 40 No. 90 degree angled car parking spaces will be constructed to the south of the Emmanuel College Buildings E and F over the old courts. Access to this car park will be via a 4.2 metre wide access point located directly north of the Botanic Road Central Access Point. Egress from this car park is provided in the north via an existing one-way 4.4 metre wide accessway which connects into the existing Emmanuel College Building E & F south car park. The access point into this car park will be sign posted accordingly.
- Western off-street car park - New off-street car park with capacity for up to 124 car parking spaces including one accessible car parking space for disabled users will be constructed to the east of Hopetoun Road, north of the east-west aligned accessway. This car park is proposed to be used by staff and students who drive to the college. The access point into this car park will be sign posted accordingly.

- Year 9 Centre off-street car park - New off-street car park with capacity for up to 19 car parking spaces will be constructed adjacent to the Year 9 Centre. Access to this car park will be via a 3.6 metre wide access point located at the Crawley Street 90 degree bend. This car park is proposed to be used by staff only. The access point into this car park will be sign posted accordingly.

Therefore, a total of 342 car parking spaces will be provided within the college once Stage 1 developed.

2.3.1.2 On-street Car Parking

As detailed in Section 2.4.2 of the Masterplan TIAR, on-street car parking is provided on Ardlie Street, Botanic Road and Hopetoun Road adjacent to the college for parents to drop off and pick up their children.

Considering that the parking on Botanic Road will be restricted to No Stopping (refer Section 3.2 of the Masterplan TIAR), a total of 80 No. on-street car parking spaces will be available for parents and visitors of the college if required.

2.3.2 Bike Parking

A total of 40 existing bicycle parking spaces are provided on the college site with 30 bicycle parking spaces provided within a bicycle shelter to the north-east of the Botanic Road Central Entry Only Access Point and up to 10 bicycles parking spaces provided on the west side of the existing G Block building.

Staff bicycle parking is currently provided informally within the main administration buildings, and staff offices. A shower for staff use is provided within the Emmanuel Centre, within the McAuley staffroom and within the G block building.

3 PARKING ASSESSMENT

3.1 Car Parking Requirement

Clause 52.06 of the Warrnambool Planning Scheme details the car parking requirement in accordance with State and Local Planning Policy for a proposed new use or a proposed change in existing use within the City of Warrnambool. Clause 52.06-5, Table 1 sets out the number of car parking spaces required for a particular use. For a Secondary School use, the car parking requirement is 1.2 spaces to each employee that is part of the maximum number of employees on site at any time.

Therefore, the car parking requirement for Stage 1 of the development is set out in Table 3.1.

Table 3.1: Car Parking Requirement

Use	Rate & Measure	Stage	Quantity	No. of Spaces Required
Secondary School	1.2 spaces to each employee that is part of the maximum number of employees on the site at any time	1 (Year 9 Centre)	175 employees on site at any time	210

As detailed in Table 3.1, the college has a statutory car parking requirement equivalent to 210 car parking spaces for Stage 1 of the development.

Therefore, the provision of 342 car parking spaces at Stage 1 of the development exceeds the statutory car parking requirement by 132 car parking spaces.

3.2 Design Standards for Car Parking

The car park and access layout has been assessed against the requirements of the Warrnambool Planning Scheme Clause 52.06-9, the Australian/ New Zealand Standard for off-street car parking (AS/NZS 2890.1:2004), and the Australian Standard for off-street parking for people with disabilities (AS/NZS 2890.6:2009).

3.2.1 Accessway & Car Parking Space Dimensions

3.2.1.1 New Access Point

The Hopetoun Road access point has been designed to cater for a 12.5 metre long HRV exiting the college and an 8.8 metre long MRV entering the college. The accessway connecting to the Hopetoun Road access point is 6.0 metres wide.

The Crawley Street access point has been designed to cater for a 6.4 metre long SRV entering and exiting the college. The accessway connecting to the Crawley Street access point is 3.6 metres wide. The proposed Crawley Street vehicle crossing has been designed in accordance with the Infrastructure Design Manual, however the splay on the northern side of the vehicle crossing is not proposed to be constructed to provide additional clearance to the existing power pole. Further, a SRV is not expected to turn left to the west side of the existing tree located centrally within the Crawley Street court bowl.

3.2.1.2 Car Parking

The existing and proposed car park access and dimensions are detailed below:

1. Eastern Off-street Car Park (Existing):

   Passenger vehicle access to this car park is provided from the existing Ardlie Street 3.5 metre wide entry and 5.0 metre wide exit point. Both access points connect to an existing 6.4 to 7.0 metre wide accessway.

   All existing 71 No. 90 degree angle car parking spaces including the two accessible car parking spaces for disabled users and shared area measures 5.2 metres long by 2.6 metres wide.

2. Emmanuel College Building E & F South Car Park (Existing):

   Passenger vehicle access to this car park is provided via the one-way roadway from the Botanic Road Central Entry point.

   All existing 34 No. 45 degree angled car parking spaces including one accessible car parking space for disabled users measure 5.2 metres long by 2.6 metres wide. The accessway servicing these car parking spaces measures 3.5-4.0 metres wide.

3. Emmanuel Centre Drop-off/ Pick-up Zone:

   Passenger vehicle access to the Emmanuel Centre drop-off/ pick-up zone is provided from the existing Botanic Road western access point. The access point connects to an existing 8.0 metre wide accessway which then narrows to 7.0 metres wide adjacent to the 45 degree angled car parking spaces.

   The 27 No. 45 degree angled drop-off/ pick-up car parking spaces to the west of the Emmanuel Centre measure 4.9 metres long by 2.6 metres wide whereas the existing and proposed 26 no. 90 degree angled drop-off/ pick-up car parking spaces and one parallel drop-off/ pick-up car parking space to the south of the Emmanuel Centre measure 5.2 metres long by 2.6 metres wide and 6.7 metres long by 2.3 metres wide respectively. The existing accessway servicing the car parking spaces to the south of the Emmanuel Centre is 6.2 metres wide.

4. Southern Car Park (Proposed):

   Passenger vehicle access to the southern car park is provided from the existing Botanic Road Central Entry Point one-way roadway via a 4.2 metre wide one-way entry only access point. The access point connects to a 7.5 metre wide accessway which circulates the car park. Egress from this car park is provided in the north via an existing one-way exit only 4.4 metre wide accessway which connects into the existing Year 7 & 8 buildings south car park.

   All 40 No. 90 degree angle car parking spaces measure 5.2 metres long by 2.6 metres wide.

5. Western Car Park:

   Passenger vehicle access to the western car park is provided from the east-west aligned accessway via a 6.4 metre wide one-way entry point. The one-way entry point connects to a 6.4 metre wide accessway which circulates the car park. The exit point from the car park is one-way only and is located at the eastern end of the car park.

The 124 No. 90 degree angle car parking spaces measure 4.9 metres long by 2.6 metres wide including one accessible car parking space for a disabled user and shared area. As per the Warrnambool Planning Scheme, the disabled car parking spaces may encroach into the accessway width by 500mm.

6. Year 9 Centre Off-street Car Park:

   Vehicle access to/ from the Year 9 Centre off-street car park is provided from Crawley Street via a 3.3 metre wide access point. The access point connects to a 3.6 metre wide accessway which provides access to the Year 9 Centre off-street car park.

All car parking space dimensions, accessway widths and access point widths meet the requirements of the Warrnambool Planning Scheme and the Australian Standards.

The shared areas adjacent to all accessible car parking spaces are to be line marked as per the AS/NZS 2890.6:2009 - Parking facilities, Part 6: Off-street parking for people with disabilities, with a bollard provided adjacent to the accessway. The accessible car parking space is to be sign posted and line marked so that it is easily identifiable upon entry into the college.

3.2.2 Safety

The following recommendations are made to improve safety within the site:

- As detailed in Section 2.2.1, to prevent parents, visitors, and local traffic from using the east-west aligned accessway, the following signage is to be installed:
  - Hopetoun Road Access Point - “Staff, Student, Bus & Maintenance Vehicle Access Only” signage.
  - East-west accessway
    - West of the bus parking bays - “School Maintenance Vehicle Access Only” signage facing west.
    - East of the raised crossing - “Bus & School Maintenance Vehicle Access Only” signage facing east towards the turning area.
    - South of the Turnaround area – “No Left Turn, Buses & School Maintenance Vehicle Excepted” signage facing approaching traffic.
- “Staff & Student Parking Only” signage be provided at the western car park access point and “Staff Parking Only” signage be provided at the eastern car park, southern car park, and Year 9 Centre car park access points.
- “Drop-off/ pick-up zone” adjacent to the Emmanuel Centre car parks.
- “No stopping” signage be provided around the drop-off/ pick-up zone turning area.
- “Zebra” crossing signage be provided at the raised crossing west of the turnaround area.
- All landscaped areas located adjacent to the pedestrian crossing points and the circulation road intersections have vegetation that is less than 900mm in height so as not to obstruct driver and pedestrian sightlines.
- The Hopetoun Road access point be provided with a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent exit lane, or adjacent landscaped areas, provided the landscaping in those areas is less than 900mm in height.

Further, as recommended in Section 5.2.2 of the Masterplan TIAR, the Botanic Road Western Access Point should be upgraded immediately to allow the right turn movement into the site and to re-enforce the prohibition of the right turn movement out of the site by completing the following works:

- The addition of extra line marking and a left turn pavement arrow adjacent to the median island to re-enforce the left turn only movement.
- The addition of a “No Right Turn at Botanic Road” signage (R2-V126l) installed within the site on the approach to Botanic Road.

- Provide a break in the double solid lines on Botanic Road adjacent to the entry lane to allow for vehicles to turn right into the access point.

It is recommended that a 40km/h speed limit during school times be implemented on Hopetoun Road due to the provision of a new pedestrian/cyclist access point.

It is understood that the off-street car parks will have lighting in accordance with the Australian Standards. This will be detailed during the design phase of the project.

3.3 Bicycle Facilities

Clause 52.34 of the Warrnambool Planning Scheme details the requirement for Bicycle Facilities in accordance with State and Local Planning Policy for a proposed new use or a proposed change in existing use within the City of Warrnambool.

3.3.1 Bicycle Facilities Requirement

Clause 52.34-5, Table 1 sets out the minimum number of bicycle spaces required for a particular use. For the proposed Secondary School use, the statutory bicycle space requirement is 1 employee space to each 20 employees, and 1 visitor space to each 5 pupils.

It is understood that the college will have 1300 students and 175 staff on site at any one time during Stage 1 of the college development. Therefore, based on the planning scheme, the proposed college will have a statutory bicycle parking requirement equivalent to 260 Bicycle parking spaces for the college students and 9 Bicycle parking spaces for staff.

Therefore, in accordance with the Warrnambool Planning Scheme, a total of 260 student bicycle parking spaces and 9 staff bicycle parking spaces are to be provided at Stage 1 of the college development.

The existing provision of a total of 40 bicycle parking spaces within the college site for student use and informal staff parking within the main administration building does not meet the requirement of the Warrnambool Planning Scheme.

However, as per the travel data received from the college, approximately 32 students at the McAuley Campus and approximately 6 students at the Rice Campus currently cycle to the college. Therefore, as Stage 1 involves the relocation of all Year 9 students from the Rice Campus to the McAuley Campus, it is expected that approximately 38 students will cycle to the college. Therefore, the existing 40 bicycle parking spaces provided for student use is a more than acceptable bicycle provision for the college site once the Stage 1 development is constructed.

Further, as more than five employee bicycle spaces are required, a shower and change room facility are to be provided on-site for staff use. Therefore, the provision of a shower and change room facility within the Emmanuel Centre, McAuley staffroom and within the G block building exceeds the requirements of the planning scheme.

3.3.2 Design of Bicycle Spaces

In accordance with Clause 52.34-6, all proposed bicycle parking hoops are to provide a bicycle parking space equivalent to 1.8 metres long and 1.0 metre wide between the rails. The access path/clear area in front of the rails is to be at least 1.5 metres wide to allow ease of access into the bicycle parking space. Further, all bicycle rails are to be:

- Securely fixed to the ground.
- Allow a cyclist to easily lock the bicycle frame and wheels.

The proposed location of the bicycle parking area:

- Provide convenient access to and from the main building entrance(s).
- Do not interfere with access to doorways, pedestrian paths, and car parking spaces.
- Do not cause a hazard to bicycle users and other users of the site.

The design of the bicycle parking facilities is in accordance with the Warrnambool Planning Scheme.

4 TRAFFIC ASSESSMENT

Refer Section 6 of the T&TS Master Plan TIAR for details on the intersection assessment of the Botanic Road/ Botanic Road Western Access Point, the Hopetoun Road/ Hopetoun Road Access Point, and the Botanic Road/ Ardlie Street intersection at full development.

As detailed in the Master Plan TIAR, the existing and proposed access points will adequately cater for the traffic generated by the extra enrolments once the school is developed in accordance with the Masterplan.

5 RECOMMENDATIONS & CONCLUSION

The following recommendations are based on the findings of the Stage 1 and Masterplan TIAR:

- Speed Limits:
    - Extend the 40km/h school zone speed limit on Botanic Road up to Raglan Parade/ Princes Highway.
    - Reduce the speed limit on Ardlie Street to 50km/h from 60km/h outside of school hours and extend the 40km/h speed limit during school hours on Ardlie Street to the north along the college boundary.
    - A 40km/h speed limit during school times be implemented on Hopetoun Road along the college boundary.

  It is noted that the change in speed limit is the responsibility of the road authority.
- Waste collection services occur any time prior to 8:00am, or after 4:00pm weekdays, or anytime on weekends and non-school days.
- Maintenance/ delivery vehicle access to the site is restricted to prior to 8:00am, between 9am and 3pm, or any time after 4:00pm school days, or anytime on weekends and non-school days.
- It is recommended that a footpath be provided on the east side of Hopetoun Road along the school frontage and connect into the existing footpath network to the north and south.
- To prevent parents, visitors, and local traffic from using the internal east-west aligned accessway, the following signage is to be installed:
    - Hopetoun Road Access Point - “Staff, Student, Bus & Maintenance Vehicle Access Only” signage.
    - East-west accessway:
        - West of the bus parking bays - “School Maintenance Vehicle Access Only” signage facing west.
        - East of the raised crossing - “Bus & School Maintenance Vehicle Access Only” signage facing east towards the turning area.
        - South of the Turnaround area – “No Left Turn, Buses & School Maintenance Vehicle Excepted” signage facing approaching traffic.
- “Staff & Student Parking Only” signage be provided at the western car park access point and “Staff Parking Only” signage be provided at the eastern car park, southern car park, Year 9 Centre car park access points.
- “Drop-off/ pick-up zone” adjacent to the Emmanuel Centre car parks.
- “No stopping” signage be provided around the drop-off/ pick-up zone turning area.
- “Zebra” crossing signage be provided at the raised crossing west of the turnaround area.
- All landscaped areas located adjacent to the pedestrian crossing points and the circulation road intersections have vegetation that is less than 900mm in height so as not to obstruct driver and pedestrian sightlines.
- The Hopetoun Road access point be provided with a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road.
- Botanic Road/ Western Access Point Intersection:
    - The addition of extra line marking and a left turn pavement arrow adjacent to the median island to re-enforce the left turn only movement.
    - The addition of a “No Right Turn at Botanic Road” signage (R2-V126(R)) installed within the site on the approach to Botanic Road.

- Provide a break in the double solid lines on Botanic Road adjacent to the entry lane to allow for vehicles to turn right into the access point.

Based on the key findings and recommendations of this TIAR, it can be concluded that the Stage 1 development is generally in accordance with the requirements of the Warrnambool Planning Scheme, Australian Standards, and the proposed school Masterplan. Further, the expansion of the college as per the Proposed Stage 1 Site Plan will not have a detrimental impact on the existing road network adjacent to the site.

Therefore, provided that the recommendations as detailed in this TIAR are made conditions of the Stage 1 planning permit and implemented into the Site Plan, then there are no traffic engineering reasons as to why the responsible authority should not grant a planning permit for the proposed changes to the site plan.

APPENDIX A – TRAFFIC IMPACT ASSESSMENT REPORT (MASTERPLAN)

T&TS TRANSPORT & TRAFFIC SOLUTIONS

Traffic Impact Assessment Report

Emmanuel College, Warrnambool

140 Botanic Road, Warrnambool

Emmanuel College

May 2024

Document Issue Record

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Description:		TIAR updated to incorporate changes to the Masterplan staging, relocation of the maintenance shed, the inclusion of 15 Crawley Street into the site, and a new off-street car park located on 13 & 15 Crawley Street.		
D	22/05/24	Tony Dinh	Michael Marsicovetere	Michael Marsicovetere
Description:		Off-street car park located on 13 & 15 Crawley Street updated to include 19 car parking spaces.		

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1 INTRODUCTION

1.1 Background

Transport & Traffic Solutions Pty Ltd (T&TS) has been engaged by Emmanuel College to update the Masterplan Traffic Impact Assessment Report (TIAR) in support of a planning permit amendment application for the proposed expansion of Emmanuel College at 140 Botanic Road, Warrnambool. The proposed expansion of Emmanuel College will be delivered over four stages (Stages 1 and 1A will be delivered at the same time).

Stage 1 will involve the relocation of all Year 9 students from the Rice Campus (Bromfield Street) to the McAuley Campus (Botanic Road) via the construction of a new Year 9 Centre south of Crawley Street and include the construction of three off-street car parks, a drop-off/ pick-up zone, bus parking zone, and maintenance shed (Stage 1 A). Stage 2 will involve the construction of a new teaching wing, food technology spaces and shared collaboration spaces within the McAuley Campus for year 7 and 8 students. Stage 3 will involve the construction of a new two-storey senior learning and arts centre buildings. Stage 4 (full development) will involve the construction of a swimming pool facility and a sports and health centre.

Three new off street car parks with capacity for up to a total of 181 car parking spaces and a new drop-off/ pick-up zone with capacity for a total of 54 car parking spaces will also be constructed as development of the college progresses. Since the issue of the Masterplan TIAR on 10 May 2022, a Planning Permit No. PP2023-0047 and Endorsed Plan dated 13 June 2023 was issued for the construction of the new drop-off/ pick-up zone with capacity for a total of 54 car parking spaces, the western off-street car park with capacity for 124 car parking spaces, a bus parking zone, a maintenance shed, the east-west accessway and a new access point on Hopetoun Road. Construction was completed in early 2024.

A new access point is proposed on Hopetoun Road (all vehicles) and Crawley Street (staff, general maintenance & delivery vehicles only). All other existing site access points will remain.

Once fully developed, the college will cater for 1,350 students and 185 employees on site at any one time.

1.2 Aim of this Report

The aim of this report is to review the Emmanuel College Masterplan from a traffic engineering perspective and determine if adequate vehicle, pedestrian, and cyclist access has been provided to/ from the site, if the provision of car parking and bicycle facilities meets the requirements of the Warrnambool Planning Scheme, and what impact the expansion of the college will have on the adjacent road network.

1.3 References

The following references were used to assist in the preparation of this report:

- Department of Environment, Land, Water and Planning, VicPlan and Planning Schemes Online, State Government of Victoria, Accessed March 2022;
- Austroads Guide to Road Design, Austroads Guide to Traffic Management, Australian Standards, and the VicRoads Supplement to the Austroads Guide and Australian Standards, as detailed in this report;
- Proposed Masterplan, 140 Botanic Road, Warrnambool, Baldasso Cortese, Drawing No. SK201, Rev K, 20 November 2023; and
- Other documents as referenced within this report.

2 EXISTING CONDITIONS ASSESSMENT

2.1 Location & Land Use

Emmanuel College is located at 140 Botanic Road, Warrnambool. It is bounded by existing residential dwellings to the north, Ardlie Street to the east, Botanic Road to the south and Hopetoun Road to the west. The total site area is approximately 10.9 hectares. Refer Figure 2.1 for the location of Emmanuel College.

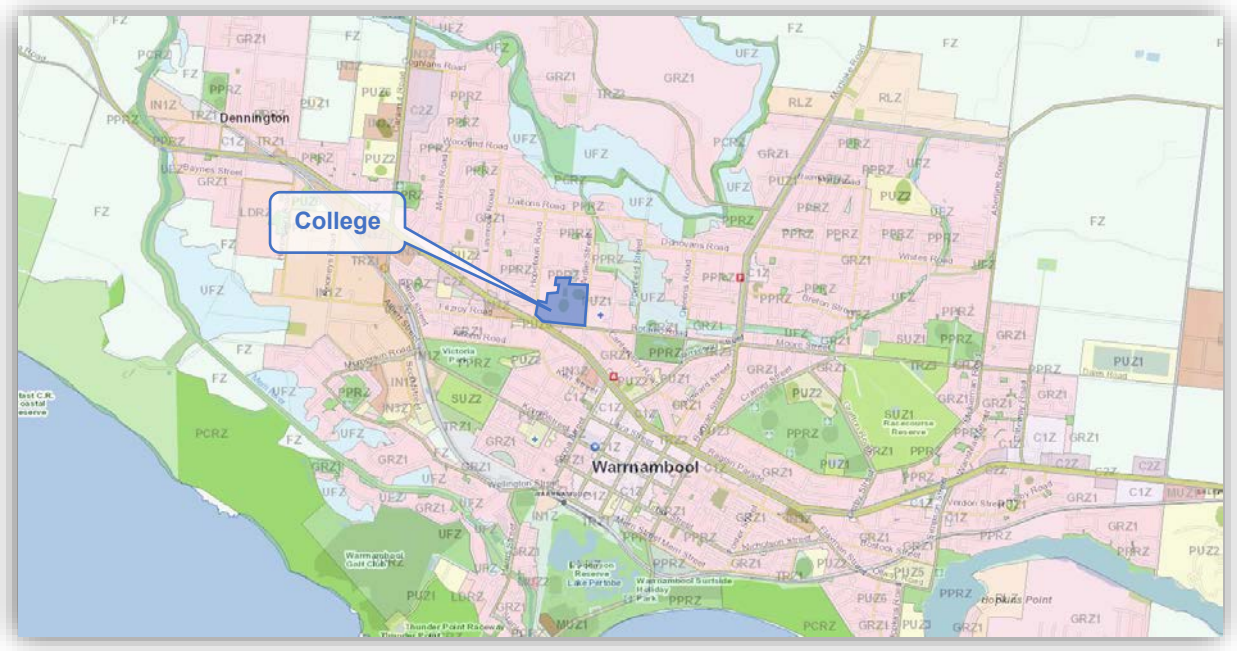


Figure 2.1: Locality Plan[1]

The college is located within a General Residential Zone – Schedule 1 (GRZ1). A Development Plan Overlay – Schedule 1 (DPO1) and Heritage Overlay (HO18) applies to the site.

2.2 Site Details

The college consists of existing school buildings, two large playing fields, the Emmanuel Centre and four off-street car parks across the site.

Access to the college and off-street car parks is provided from the existing road network as follows:

- Ardlie Street via a 3.5 metre wide entry only access point and a 5.0 metre wide exit only egress point located 75 metres and 50 metres south of Barbers Lane respectively. This access point services the existing eastern off-street car park with capacity for up to 71 car parking spaces.
- Botanic Road via a 4.7 metre wide entry only access point and a 5.2 metre wide exit only egress point located 100 metres and 30 metres west of the Botanic Road/ Ardlie Street roundabout respectively. This access point services the existing Emmanuel College Buildings E & F South Car Park with capacity for up to 34 car parking spaces.
- Botanic Road via an 8.0 metre wide two-way access point located approximately 55 metres east of the Raglan Parade/ Fitzroy Road/ Botanic Road intersection. This access point services the existing Emmanuel Centre South Car Park with capacity for 21 car parking spaces and the Year 7 & 8 Buildings South Car Park with capacity for up to 50 car parking spaces.

A bus zone with capacity for three buses (private) is provided on the north side of Botanic Road. A bus zone with capacity for ten buses (9 private & 1 public) and one bus (public) is also provided on the west

[1] http://mapshare.maps.vic.gov.au/vicplan/, March 2022

and east side of Ardlie Street respectively. An existing Children's Crossing is provided on Ardlie Street to the east of the college, approximately 30 metres north of the Botanic Road/ Ardlie Street roundabout.

A total of two existing pedestrian/ cyclist access points are provided into the college as follows:

1. Botanic Road – A 2.5 metre wide pedestrian/ cyclist path is provided at the site's southern boundary, directly adjacent to the bus zone in front of the Emmanuel Centre. This pedestrian/ cyclist access path connects to a student gathering area which provides access to the college buildings.
2. Ardlie Street – A 2.0 metre wide gate lockable pedestrian access point is provided on the site's eastern boundary, approximately 15 metres north of the children's crossing on Ardlie Street. This pedestrian access point provides access to the buildings on the east side of the college.

Refer Figure 2.2 for the location of the college access points, off-street car parks, bus zones and children's crossing.

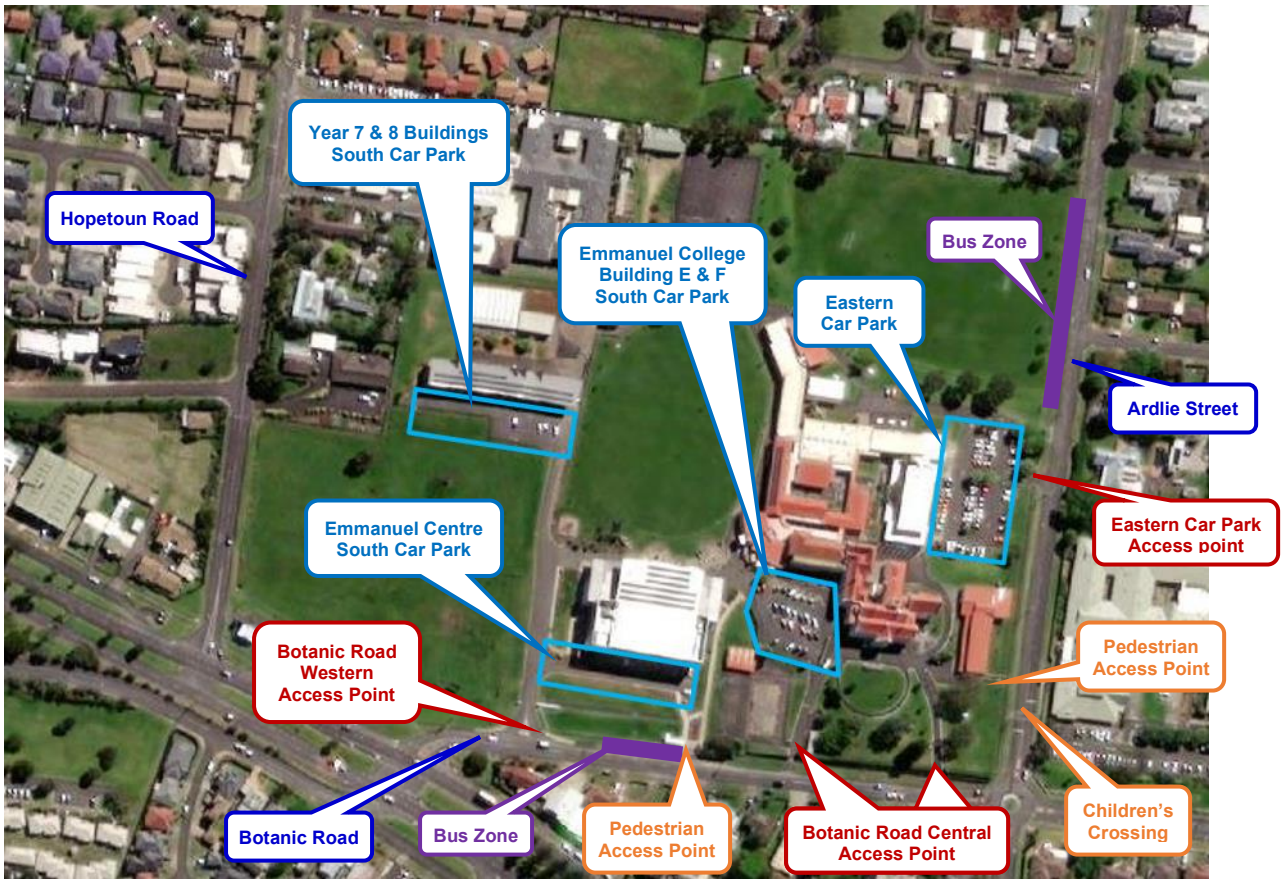


Figure 2.2: Site Details Map

2.3 Road Network

2.3.1 Road Network Characteristics

An inspection of the road network adjacent to the college was undertaken on Thursday 27 January 2022, between the hours of 12:30pm and 3:00pm. Conditions were sunny and dry. Details of the site inspection are as follows.

2.3.1.1 Ardlie Street

Ardlie Street is a sealed two-lane two-way undivided road which runs in a north-south direction between Daltons Road in the north and Raglan Parade (A1) in the south. Referring to Warrnambool's Register of Public Roads, Ardlie Street is classified as an "Access" road between Botanic Road and Raglan Parade, and a "Collector" road between Daltons Road and Botanic Road.

Adjacent to the college, Ardlie Street consists of a 10.8 metre wide carriageway. A 1.5 metre wide footpath is provided on the west side of Ardlie Street and on the east side of Ardlie Street to the south of the eastern bus stop only. Ardlie Street slopes downwards from Raglan Parade to a sag adjacent to Barbers Lane which then inclines again to the north. Refer Figure 2.3 and Figure 2.4.

A posted speed limit of 60 km/h applies to Ardlie Street. A time controlled school zone speed limit of 40 km/h applies to Ardlie Street (8-9:30am and 2:30-4pm school days) between 5 Ardlie Street (north of Botanic Road) and Barbers Lane.

Figure 2.3: Ardlie Street, looking north

Figure 2.4: Ardlie Street, looking south

2.3.1.2 Botanic Road

Botanic Road is a sealed two-lane two-way undivided road which runs in an east-west direction between the Hopkins Highway/ Moore Street/ Jamieson Street/ Botanic Road roundabout in the east and Raglan Parade in the west. Referring to Warrnambool's Register of Public Roads, Botanic Road is classified as a "Link" road.

Adjacent to the college, Botanic Road comprises of a 7 metre wide carriageway with a 1.5 metre wide bicycle lane on both sides of the carriageway. A 1.5 metre wide footpath and varying width grass verge is provided on both sides of Botanic Road. A 3.5 metre wide bus bay is provided on the north side of Botanic Road in front of the Emmanuel Centre. Botanic Road inclines to the east from Raglan Parade to a crest located adjacent to 103 Botanic Road. Refer Figure 2.5 and Figure 2.6.

A posted speed limit of 60 km/h applies to Botanic Road. A time controlled school zone speed limit of 40 km/h applies to Botanic Road (8-9:30am and 2:30-4pm school days) between 95 Botanic Road and 121 Botanic Road (east of the Emmanuel Centre access point).

The intersection of Botanic Road and Ardlie Street is controlled by a single lane roundabout. Refer Figure 2.7.

Figure 2.5: Botanic Road, looking east

Figure 2.6: Botanic Road, looking west

Figure 2.7: Botanic Road/ Ardlie Street Roundabout

2.3.1.3 Hopetoun Road

Hopetoun Road is a sealed two-lane two-way undivided road which runs in north-south direction between Daltons Road in the north and Raglan Parade in the south. Referring to Warrnambool's Register of Public Roads, Hopetoun Road is classified as a "Collector" road.

Adjacent to the college, Hopetoun Road consists of a 10.9 metre wide carriageway. A 1.5 metre wide footpath is provided on the west side of the road only. Hopetoun Road inclines to the north from Raglan Parade. Refer Figure 2.8 and Figure 2.9.

An urban default speed limit of 50 km/h applies to Hopetoun Road.

Figure 2.8: Hopetoun Road, looking north

Figure 2.9: Hopetoun Road, looking south

2.3.1.4 Crawley Street

Crawley Street is a sealed two-lane two-way undivided road which runs in a generally east-west direction between Ardlie Street in the east and Churchill Street/ Williams Street in the west. Adjacent to the Crawley Street (East) Reserve Playground, Crawley Street is a one-way road. Referring to Warrnambool's Register of Public Roads, Crawley Street is classified as an "Access" road

North of the college, Crawley Street consists of an 8.1 metre wide carriageway (two-way) between 5 Crawley Street and Ardlie Street with a 1.5 metre wide footpath on both sides of the road. Between 5 Crawley Street and 15 Crawley Street, the Crawley Street carriageway reduces to 5.8 metre wide (one-way) with a 1.5 metre wide footpath on the south side of the road only. Refer Figure 2.10 and Figure 2.11.

An urban default speed limit of 50 km/h applies to Crawley Street.

Figure 2.10: Crawley Street, looking east

Figure 2.11: Crawley Street, looking west

2.3.2 Road Network Volumes

Traffic volume surveys were completed by Nationwide Traffic Surveys Pty Ltd on Hopetoun Road (between the McPherson Crescent and Princes Highway/Raglan Parade) between 20 February 2022 and 27 February 2022, and at the Botanic Road/ Ardlie Street roundabout on Wednesday 23 February between 8:00am-9:30am and 2:30pm-4:30pm. The results are summarised below.

2.3.2.1 Hopetoun Road

A summary of the traffic volumes for all vehicles on Hopetoun Road is provided in Table 2.1. Refer Appendix A for a copy of the traffic volume summary.

Table 2.1: Traffic Volume Survey Results – Hopetoun Road

	Direction		Combined	Average Speed	85th Percentile Speed
	North	South			
Weekday Average (Monday-Friday)	1,401 vpd	1,190 vpd	2,591 vpd	53.3	61.3
MDWK Average AM Peak (8:00 to 9:00)	52 vph	133 vph	184 vph	53.0	61.5
MDWK Average PM Peak (15:00 to 16:00)	131 vph	108 vph	239 vph	53.9	61.4

A summary of the existing traffic volumes as illustrated in Table 2.1 follows:

- The 24-hour two-way daily traffic volume for Hopetoun Road is 2591 vehicles per day, with 1401 vpd (54%) travelling northbound and 1190 vpd (46%) travelling southbound.

- The two-way mid-week average AM peak hour traffic volume is 184 vehicles per hour (7% of the daily traffic volume), with 52 vph (28%) travelling northbound and 133 vph (72%) travelling southbound.
- The two-way mid-week average PM peak hour traffic volume is 239 vehicles per hour (9% of the daily traffic volume), with 131 vph (55%) travelling northbound and 108 vph (45%) travelling southbound.
- The combined weekday average speed is 53.3 km/h.
- The combined weekday 85th percentile speed is 61.3 km/h.

Further to the above:

- Approximately 4.4% of vehicles recorded on Hopetoun Road were commercial vehicles.

As detailed in section 2.3.1.3, Hopetoun Road is classified as a Collector Road. The expected capacity of a Collector Road is 3,000vpd to 7,000vpd[2] vehicles per day (vpd). Therefore, the existing recorded traffic volume equivalent to 2,591 vpd is well below the expected capacity of this road.

2.3.2.2 Ardlie Street & Botanic Road

Traffic volume data has been provided by Warrnambool City Council for Botanic Road and Ardlie Street as follows:

- Botanic Road between Raglan Parade and Ardlie Street between 11 August 2018 and 21 August 2018.
    - AM Peak: 480 vehicles per hour
    - PM Peak: 440 vehicles per hour
    - Daily: 4,450 vehicles per day
- Ardlie Street between Barbers Lane and Conns Lane between 19 July 2018 and 31 July 2018.
    - AM Peak: 240 vehicles per hour
    - PM Peak: 280 vehicles per hour
    - Daily: 2,300 vehicles per day

As detailed in section 2.3.1.1 and 2.3.1.2, both Ardlie Street and Botanic Road are classified as a Collector Road and Link Road respectively. The expected capacity of a Collector Road is 3,000vpd to 7,000vpd[2], and for a Link Road is 7,000vpd to 12,000vpd. Therefore, the estimated traffic volume equivalent to 2,300vpd for Ardlie Street and 4,450vpd for Botanic Road is well below the expected capacity of these roads.

2.3.2.3 Botanic Road/ Ardlie Street Roundabout

Figure 2.12 below provides a summary of the 30 minute AM and PM peak traffic volumes for all vehicles recorded at the Botanic Road/ Ardlie Street roundabout between 8:30am and 9:00am and 3:30pm and 4:00pm respectively. A 30 minute peak hour has been selected for analysis purposes due to the short duration of the college peak hour.

[2] Clause 56.06-8 Lot access objective of the Warrnambool Planning Scheme.

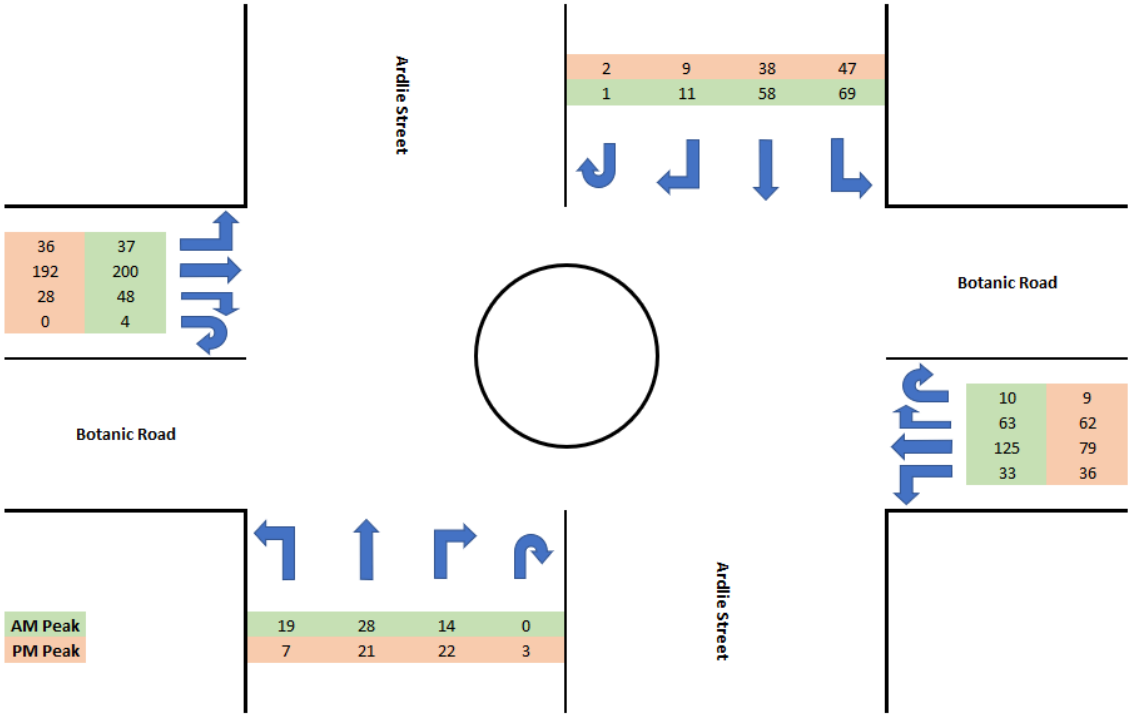


Figure 2.12: Traffic Volume Survey Results – Botanic Road/ Ardlie Street Roundabout

To understand what impact the proposed development of the college will have on the existing Botanic Road/ Ardlie Street roundabout, a check of the operational performance of the existing roundabout was undertaken using SIDRA Intersection 9.0 software.

A summary of the Degree of Saturation, Average Delay, Level of Service, and 95% Back of Queue Distance results of the analysis for the "total approach" of the roundabout with the existing traffic volumes are provided in Table 2.2. Full results are provided in Appendix B.

Table 2.2: SIDRA Summary Results – Existing Botanic Road/ Ardlie Street Roundabout

Approach Leg	Ardlie Street (South)	Botanic Road (East)	Ardlie Street (North)	Botanic road (West)
AM Peak				
Degree of Saturation	0.143	0.441	0.375	0.552
Average Delay (sec)	5.7	5.3	7.1	5.2
Level of Service	A	A	A	A
95% Queue Distance (m)	5.7	22.5	18.1	32.9
PM Peak				
Degree of Saturation	0.110	0.325	0.243	0.482
Average Delay (sec)	5.7	4.8	6.4	4.7
Level of Service	A	A	A	A
95% Queue Distance (m)	4.1	15.2	10.7	25.2

As detailed in Table 2.2, the Ardlie Street Road approach legs have a Level of Service A, Degree of Saturation below 0.38, Average Delay less than 8 seconds, and Queues less than 19 metres long during both the AM Peak and PM Peak periods.

The Botanic Road approach legs have a Level of Service A, Degree of Saturation below 0.56, Average Delay less than 6 seconds, and Queues less than 33 metres long during both the AM and PM Peak periods.

These results indicate that the existing roundabout is currently operating well below its expected capacity.

2.3.3 Site Access Point Volumes

Traffic volume surveys were completed by Nationwide Traffic Surveys Pty Ltd at the Botanic Road/ Botanic Road Western Access Point intersection (two-way access point), the Botanic Road/ Botanic Road Central Access Point Intersection (one-way entry and one-way exit), and at the Ardlie Street/ Eastern Car Park Access Point Intersection (one-way entry & one-way exit) on Wednesday 23 February between 8:00am-9:30am and 2:30pm-4:30pm.
Refer Figure 2.13 to Figure 2.15 for the intersection turning movement volumes at these intersections during the 30 minute AM & PM Peak periods between 8:30am to 9:00am and 3:30pm to 4:00pm respectively.

A check of the operational performance of the existing site access points was undertaken using SIDRA Intersection 9.0 software to understand what impact the proposed development of the college will have on the existing site access points.

2.3.3.1 Botanic Road/ Botanic Road Western Access Point Intersection

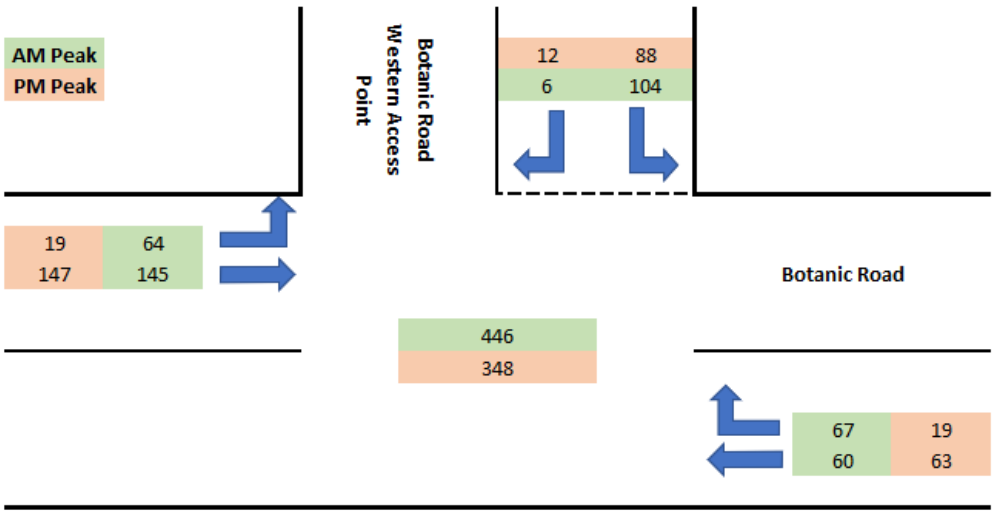


Figure 2.13: Traffic Volume Survey Results – Botanic Rd/ Botanic Rd Western Access Point Intersection[3]

A summary of the Degree of Saturation, Average Delay, Level of Service, and 95% Back of Queue Distance results of the analysis for the "total approach" of the intersection with the existing traffic volumes are provided in Table 2.3. Full results are provided in Appendix B.

[3] It is noted that only left-in/ left-out movements are permitted at the existing Botanic Road Western Access Point due to the existing double solid lines provided on Botanic Road across the access point. Refer Section 3.3 for the history of this access point including details of how right turn movements into the college were originally permitted by VicRoads & Council.

Table 2.3: SIDRA Summary Results – Existing Botanic Rd/ Botanic Rd Western Access Point Intersection

Approach Leg	Botanic Road (East)	Botanic Road Western AP (North)	Botanic Road (West)
AM Peak			
Degree of Saturation	0.177	0.186	0.226
Average Delay (sec)	3.5	4.7	1.1
Level of Service	-	A	-
95% Queue Distance (m)	6.5	5.5	0
PM Peak			
Degree of Saturation	0.094	0.171	0.173
Average Delay (sec)	1.4	4.7	0.4
Level of Service	-	A	-
95% Queue Distance (m)	2.1	4.9	0

As detailed in Table 2.3, the Botanic Road Western Access Point approach has a Level of Service A, Degree of Saturation below 0.19, Average Delay less than 5 seconds, and Queues less than 5 metres long during both the AM Peak and PM Peak periods.

The Botanic Road approaches have a Degree of Saturation below 0.23, Average Delay less than 4 seconds, and Queues less than 7 metres long during both the AM and PM Peak periods.

These results indicate that the existing intersection is currently operating well below its expected capacity.

2.3.3.2 Botanic Rd/ Botanic Rd Central Access Point Intersection

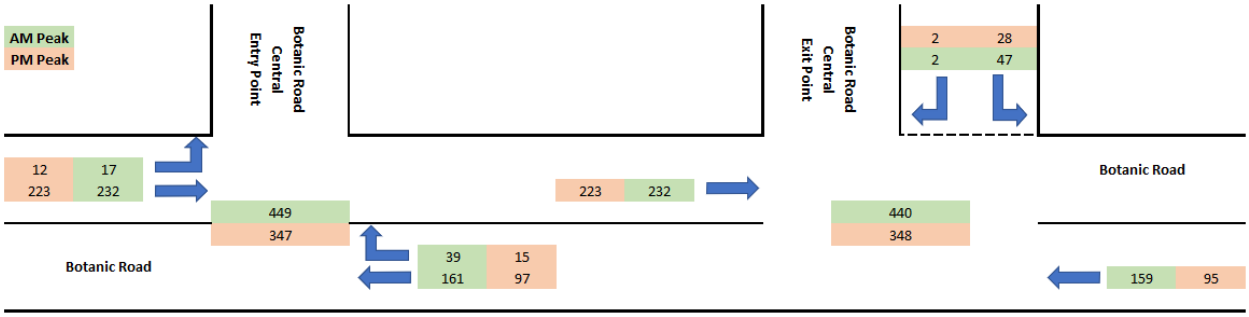


Figure 2.14: Traffic Volume Survey Results – Botanic Rd/ Botanic Rd Central Access Point Intersection

A summary of the Degree of Saturation, Average Delay, Level of Service, and 95% Back of Queue Distance results of the analysis for the "total approach" of the intersection with the existing traffic volumes are provided in Table 2.4. Full results are provided in Appendix B.

Table 2.4: SIDRA Summary Results – Existing Botanic Rd/ Botanic Rd Central Access Point Intersection

	Entry Point Intersection		Exit Point Intersection		
Approach Leg	Botanic Road (East)	Botanic Road (West)	Botanic Road (East)	Botanic Rd Central Exit Point (North)	Botanic Road (West)
AM Peak					
Degree of Saturation	0.243	0.259	0.165	0.098	0.240
Average Delay (sec)	2.0	0.3	0	5.4	0
Level of Service	-	-	-	A	-
95% Queue Distance (m)	6.4	0	0	2.6	0
PM Peak					
Degree of Saturation	0.129	0.244	0.098	0.059	0.231
Average Delay (sec)	1.2	0.2	0	5.2	0
Level of Service	-	-	-	A	-
95% Queue Distance (m)	2.2	0	0	1.5	0

As detailed in Table 2.4, the Botanic Road Central Exit Point approach has a Level of Service A, Degree of Saturation below 0.1, Average Delay less than 6 seconds, and Queues less than 3 metres long during both the AM Peak and PM Peak periods.

All Botanic Road approaches at both the entry and exit points have a Degree of Saturation below 0.26, Average Delay less than 2 seconds, and Queues less than 7 metres long during both the AM and PM Peak periods.

These results indicate that the existing intersections are currently operating well below expected capacity.

2.3.3.3 Ardlie Street/ Eastern Car Park Access Point Intersection

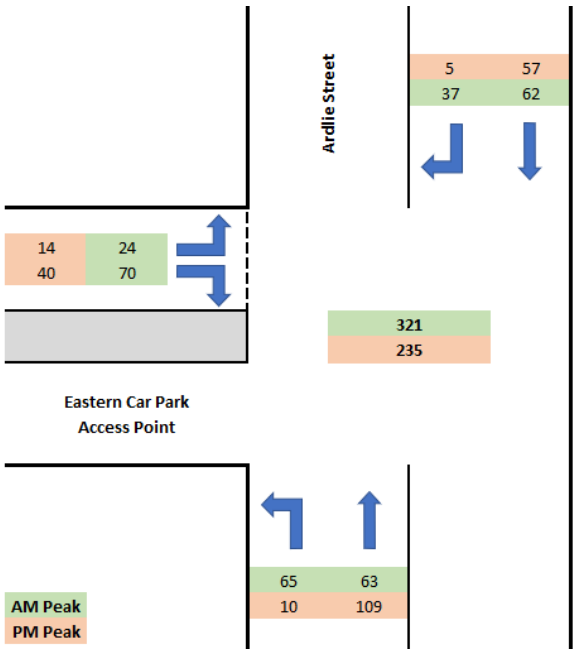


Figure 2.15: Traffic Volume Survey Results – Ardlie Street/ Eastern Car Park Access Point Intersection

A summary of the Degree of Saturation, Average Delay, Level of Service, and 95% Back of Queue Distance results of the analysis for the "total approach" of the intersection with the existing traffic volumes are provided in Table 2.5. Full results are provided in Appendix B.

Table 2.5: SIDRA Summary Results – Existing Ardlie Street/ Eastern Car Park Access Point Intersection

Approach Leg	Ardlie Street (South)	Ardlie Street (North)	Eastern Car Park AP (West)
AM Peak			
Degree of Saturation	0.129	0.113	0.156
Average Delay (sec)	1.7	2.0	4.8
Level of Service	-	-	A
95% Queue Distance (m)	0	3.5	3.8
PM Peak			
Degree of Saturation	0.117	0.063	0.086
Average Delay (sec)	0.3	0.4	4.7
Level of Service	-	-	A
95% Queue Distance (m)	0	0.6	2.0

As detailed in Table 2.5, the Eastern Car Park Access Point approach has a Level of Service A, Degree of Saturation below 0.16, Average Delay less than 5 seconds, and Queues less than 4 metres long during both the AM Peak and PM Peak periods.

The Ardlie Street approaches have a Degree of Saturation below 0.13, Average Delay less than 2 seconds, and Queues less than 4 metres long during both the AM and PM Peak periods.

These results indicate that the existing intersection is currently operating well below its expected capacity.

2.3.3.4 Site Access Point Intersections Summary

Based on the intersection turning movement volumes, a total of 289 vehicles and 253 vehicles enter and exit the college respectively during the 30 minute AM Peak period, and a total of 80 vehicles and 184 vehicles enter and exit the college respectively during the 30 minute PM Peak period.

2.3.3.5 Existing Trip Generation Rate

Based on a total of 1,050 students present on site at Emmanuel College during the time of the survey, it can be concluded that the college generates approximately 0.52 two-way vehicle trips per student (53% enter & 47% exit) during the 30 minute AM Peak period and 0.25 two-way vehicle trips per student (30% enter & 70% exit) in the 30 minute PM peak period.

2.4 Car Parking

2.4.1 Car Parking Provision

The following off-street and on-street car parking facilities are provided within and external to the college.

- Off-street
  - Eastern car park.
  - Emmanuel College Buildings E and F south car park.
  - Emmanuel Centre south car park.
  - Year 7 & 8 buildings south car park.
- On-street
  - Ardlie Street - Between Crawley Street and Botanic Road.
  - Botanic Road - Between Raglan Parade/ Princes Highway and Ardlie Street.
  - Hopetoun Road - Between McPherson Crescent and Raglan Parade/ Princes Highway.

Refer Figure 2.16 for the car parking locations.

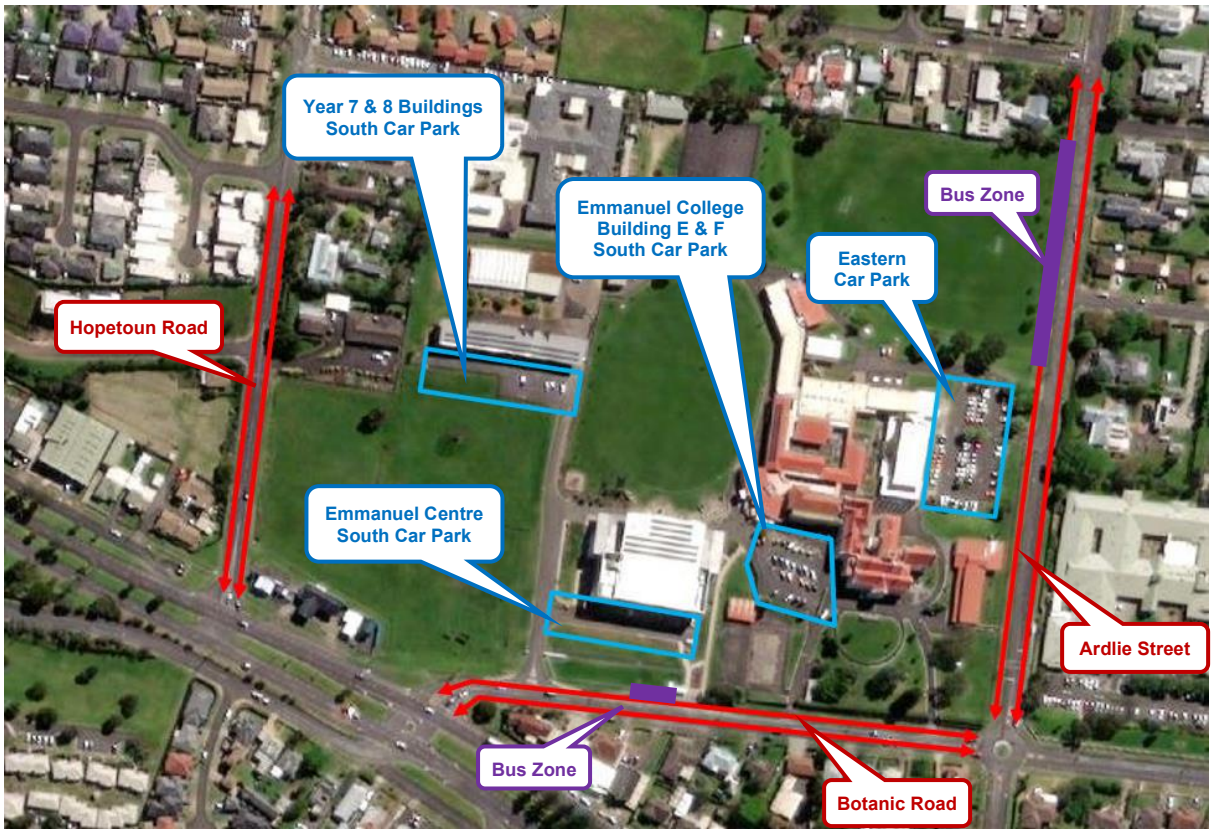


Figure 2.16: Car Parking Occupancy Survey Map

2.4.2 Car Parking Occupancy Survey

A Car Parking Occupancy Survey was completed of the off-street and on-street car parking facilities as detailed in Figure 2.16 by Nationwide Traffic Surveys on Wednesday 23 February 2022 between 8:00am-9:30am and 2:30pm-4:00pm at 15 minute intervals.

The car parking occupancy survey was completed to determine the existing off-street and on-street car parking demand.

2.4.2.1 On-street Car Parking Survey Results

Ardlie Street

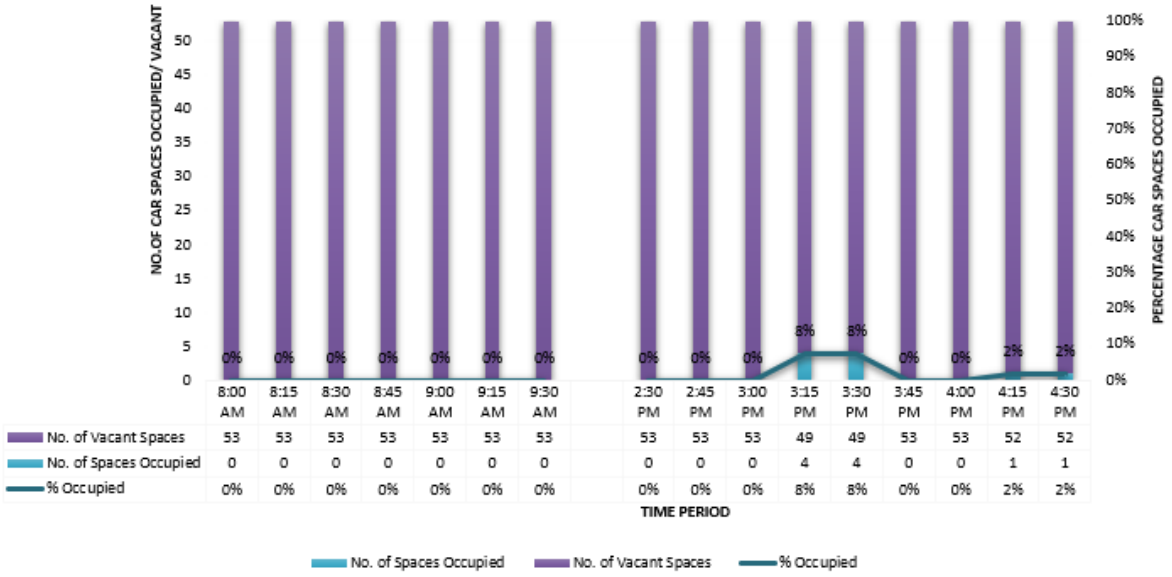
Ardlie Street between Crawley Street and Botanic Road has a total capacity for up to 42 on-street car parking spaces and 11 bus parking spaces. The east side of Ardlie Street has capacity for up to 27 car parking spaces and one bus parking space (public bus), and the west side of Ardlie Street has capacity for up to 15 car parking spaces and 10 bus parking spaces (9 school buses and 1 public bus) within a bus zone.

The Ardlie Street parking spaces are controlled as follows:

- East Side
  - Time controlled Bus zone (between 8:00am to 5:00pm Mon-Fri) – North of the children's crossing.
- West Side
  - No Stopping when flags are displayed - Between Botanic Road and approximately 20 metres north of the children's crossing cross walk line.
  - Time controlled Bus zone (between 8:30am to 4:30pm school days) - Between Crawley Street and opposite 52 Ardlie Street.
  - Time controlled No stopping (between 8:30am to 4:30pm school days) – Between the bus zone and the bus stop flag/hail post located opposite 40 Ardlie Street.

All other on-street car parking spaces between Crawley Street and Botanic Road are unrestricted.

The Ardlie Street car parking occupancy survey results are summarised in Figure 2.17.



	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	2:30 PM	2:45 PM	3:00 PM	3:15 PM	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM
No. of Vacant Spaces	53	53	53	53	53	53	53	53	53	53	49	49	53	53	52	52
No. of Spaces Occupied	0	0	0	0	0	0	0	0	0	0	4	4	0	0	1	1
% Occupied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	8%	0%	0%	2%	2%

Figure 2.17: Car Parking Occupancy Survey Results – Ardlie Street

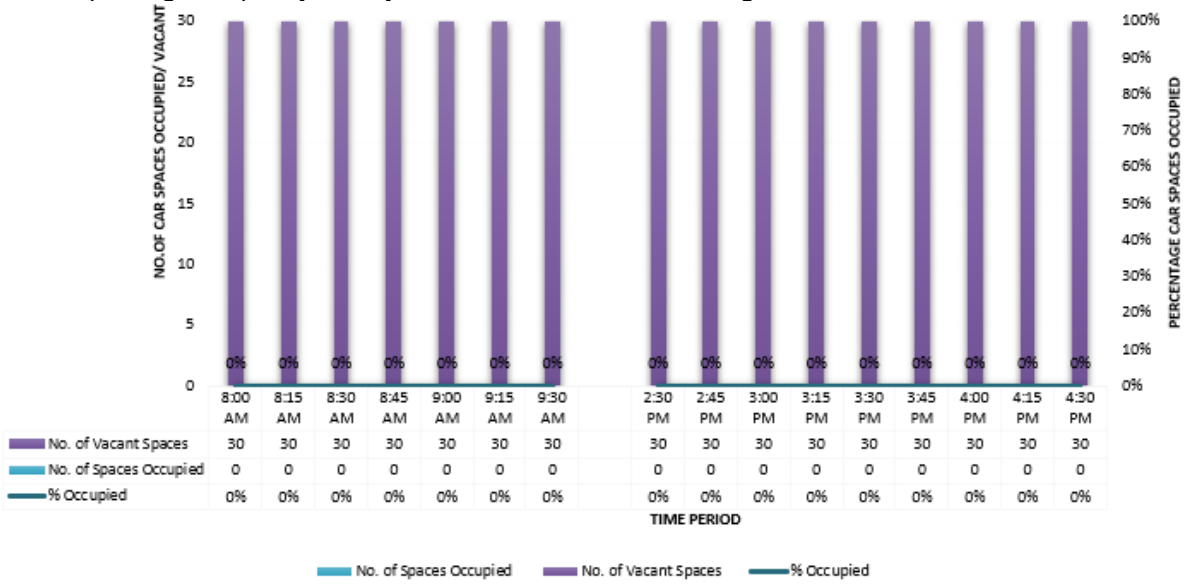
As illustrated in Figure 2.17, zero (0) on-street car parking spaces were occupied during the AM period. During the PM period, the peak demand for car parking occurred at 3:15pm and 3:30pm with a total of four (4) car parking spaces occupied. During this same time three (3) buses were parked in the bus zone on the west side of Ardlie Street.

Botanic Road

Botanic Road between Raglan Parade/ Princes Highway and Ardlie Street has a total capacity for up to 27 on-street car parking spaces and 3 bus parking spaces. The north side of Botanic Road has capacity for up to 10 car parking spaces and three bus parking spaces (school bus) within a bus zone, and the south side of Botanic Road has capacity for up to 17 car parking spaces.

All on-street car parking spaces are unrestricted, where-as the bus zone is time controlled between 8:30am-9:15am and 3:15pm-4:15pm school days.

The car parking occupancy survey results are summarised in Figure 2.18.



	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	2:30 PM	2:45 PM	3:00 PM	3:15 PM	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM
No. of Vacant Spaces	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
No. of Spaces Occupied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Occupied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Figure 2.18: Car Parking Occupancy Survey Results – Botanic Road

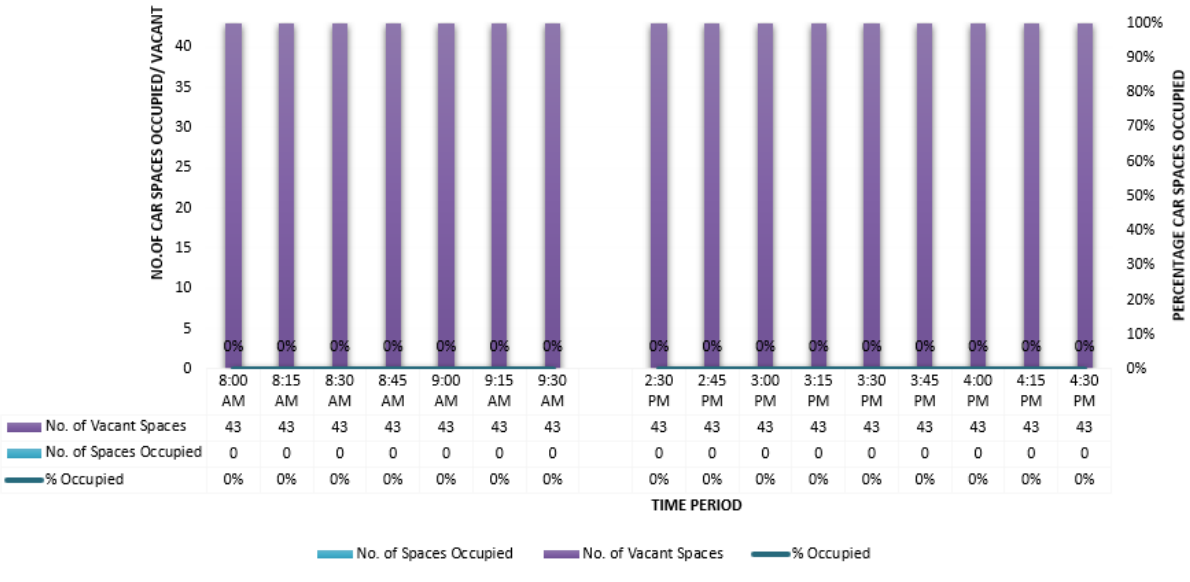
As illustrated in Figure 2.18, zero (0) on-street car parking spaces were occupied during the AM and PM period.

Hopetoun Road

Hopetoun Road between McPherson Crescent and Raglan Parade/ Princes Highway has a total capacity for up to 43 on-street car parking spaces. The east and west side of Hopetoun Road has capacity for up to 24 car parking spaces and 19 car parking spaces, respectively.

All on-street car parking spaces are unrestricted.

The car parking occupancy survey results are summarised in Figure 2.19.



	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	2:30 PM	2:45 PM	3:00 PM	3:15 PM	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM
No. of Vacant Spaces	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
No. of Spaces Occupied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Occupied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Figure 2.19: Car Parking Occupancy Survey Results – Hopetoun Road

As illustrated in Figure 2.19, zero (0) on-street car parking spaces were occupied during the AM and PM period.

2.4.2.2 On-street Car Parking Occupancy Summary

Based on the car parking occupancy survey results, the college generated no demand for on-street car parking during the AM Period, where-as during the PM period the college generated a peak demand for four (4) on street car parking spaces between 3:15pm and 4:15pm.

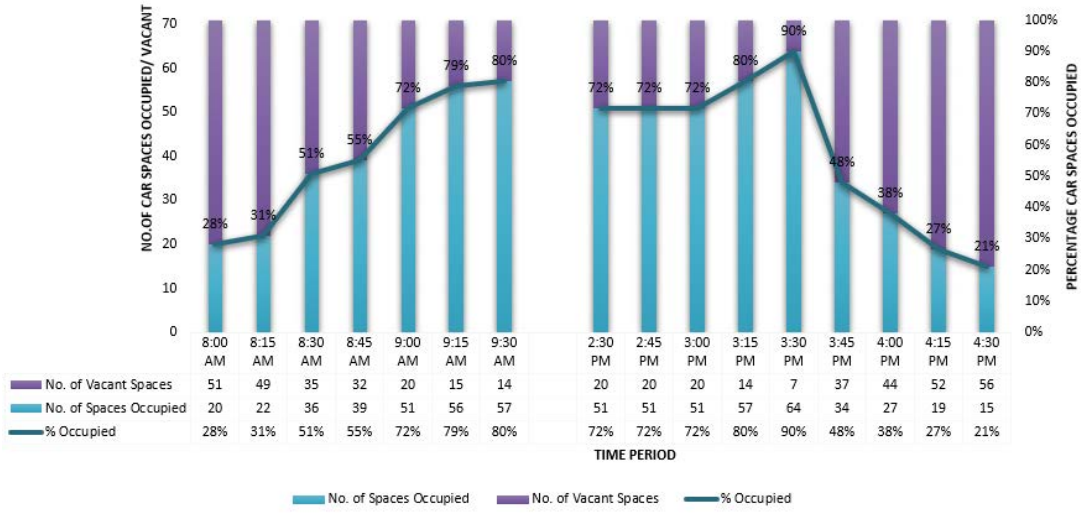
Based on the car parking occupancy survey results, it can be concluded that the college has a very low demand for on-street car parking spaces. This is likely due to parents and visitors of the college using the off-street car park to drop-off and pick-up children, and a majority of students using alternative modes of transport such as walking, cycling, and bus whilst travelling to/ from the college.

2.4.2.3 Off-street Car Parking Survey Results

Eastern Car Park

The eastern car park consists of 71 car parking spaces including one accessible car parking space for disabled users. All car parking spaces within the eastern off-street car park are unrestricted.

The car parking occupancy survey results are summarised in Figure 2.20.



	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	2:30 PM	2:45 PM	3:00 PM	3:15 PM	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM
No. of Vacant Spaces	51	49	35	32	20	15	14	20	20	20	14	7	37	44	52	56
No. of Spaces Occupied	20	22	36	39	51	56	57	51	51	51	57	64	34	27	19	15
% Occupied	28%	31%	51%	55%	72%	79%	80%	72%	72%	72%	80%	90%	48%	38%	27%	21%

Figure 2.20: Car Parking Occupancy Survey Results – Eastern Car Park

As illustrated in Figure 2.20, during the AM period, the number of occupied car parking spaces increases gradually from 20 (28%) spaces recorded at 8:00am to a peak of 57 (80%) spaces recorded at 9:30am.

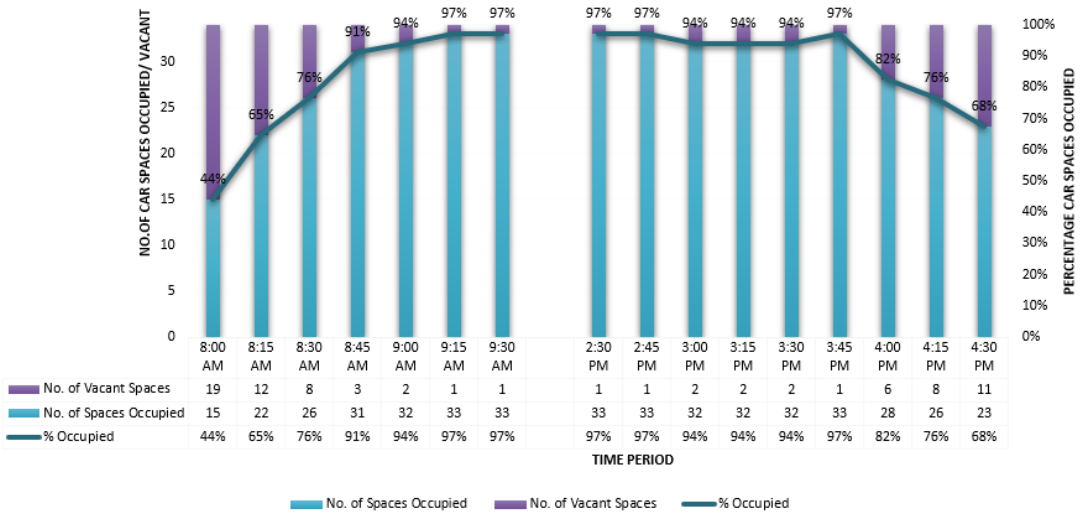
During the PM period, the number of occupied car parking spaces increases from 51 (72%) spaces recorded at 2:30pm to a peak of 64 (90%) spaces recorded at 3:30pm. After this time the number of car parking spaces occupied falls rapidly to 15 (21%) spaces recorded at 4:30pm

It is noted that between 9:30am and 2:30pm, six (6) vehicles (staff) left the car park.

Emmanuel College Building E & F South Car Park

The Emmanuel College Building E & F South Car Park consists of 34 car parking spaces including one accessible car parking space for disabled users, two visitor spaces and one car parking space for the principal. All other car parking spaces within the off-street car park are unrestricted.

The car parking occupancy survey results are summarised in Figure 2.21.



	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	2:30 PM	2:45 PM	3:00 PM	3:15 PM	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM
No. of Vacant Spaces	19	12	8	3	2	1	1	1	1	2	2	2	1	6	8	11
No. of Spaces Occupied	15	22	26	31	32	33	33	33	33	32	32	32	33	28	26	23
% Occupied	44%	65%	76%	91%	94%	97%	97%	97%	97%	94%	94%	94%	97%	82%	76%	68%

Figure 2.21: Car Parking Occupancy Survey Results – Emmanuel College Building E & F South Car Park

As illustrated in Figure 2.21, during the AM period, the number of occupied car parking spaces increases gradually from 15 (44%) spaces recorded at 8:00am to a peak of 33 (97%) spaces recorded at 9:15am and 9:30am.

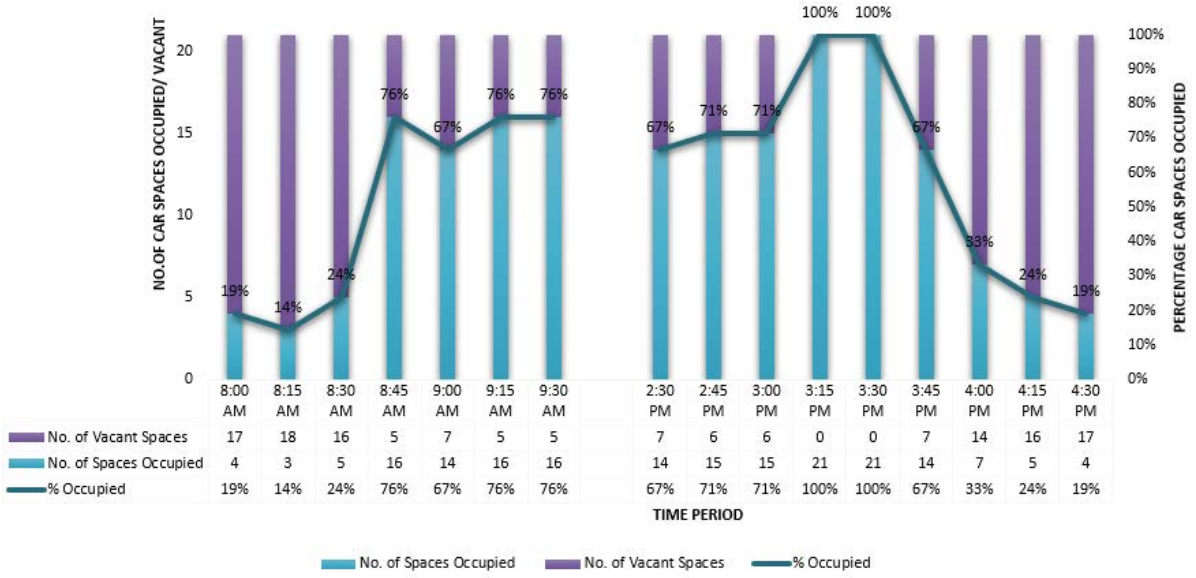
During the PM period, the number of occupied car parking spaces is constant between 2:30pm and 4:00pm with 33 (97%) spaces occupied. After this time the number of occupied car parking spaces falls gradually to 23 (68%) spaces recorded at 4:30pm.

It is noted that between 9:30am and 2:30pm, no vehicles left the car park.

Emmanuel Centre South Car Park

The Emmanuel Centre South Car Park consists of 21 car parking spaces. All car parking spaces within this car park are unrestricted.

The car parking occupancy survey results are summarised in Figure 2.22.



	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	2:30 PM	2:45 PM	3:00 PM	3:15 PM	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM
No. of Vacant Spaces	17	18	16	5	7	5	5	7	6	6	0	0	7	14	16	17
No. of Spaces Occupied	4	3	5	16	14	16	16	14	15	15	21	21	14	7	5	4
% Occupied	19%	14%	24%	76%	67%	76%	76%	67%	71%	71%	100%	100%	67%	33%	24%	19%

Figure 2.22: Car Parking Occupancy Survey Results – Emmanuel Centre South Car Park

As illustrated in Figure 2.22, during the AM period, the number of occupied car parking spaces increases gradually from 4 (19%) spaces recorded at 8:00am to a peak of 16 (76%) spaces recorded at 9:30am.

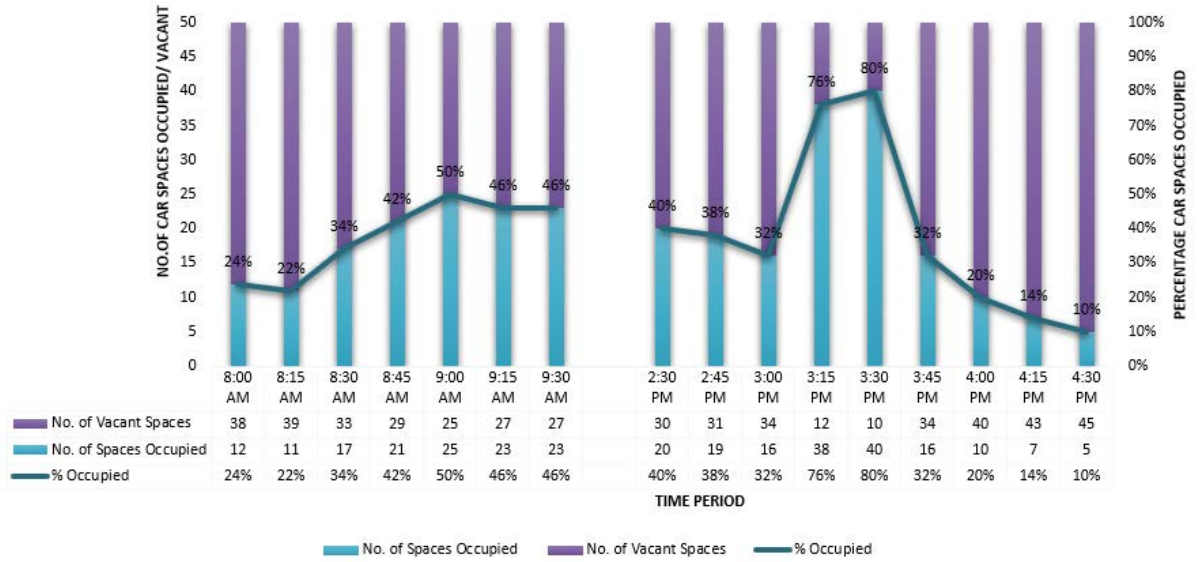
During the PM period, the number of occupied car parking spaces increases from 14 (67%) spaces recorded at 2:30pm to a peak of 21 (100%) spaces recorded at 3:15pm and 3:30pm. After this time the number of car parking spaces occupied falls rapidly to 4 (19%) spaces recorded at 4:30pm.

It is noted that between 9:30am and 2:30pm, two (2) vehicles (staff) left the car park.

Year 7 & 8 Buildings South Car Park

The Year 7 & 8 Buildings South Car Park consists of approximately 50 car parking spaces. All car parking spaces within the western off-street car park are unrestricted.

The car parking occupancy survey results are summarised in Figure 2.23.



	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	2:30 PM	2:45 PM	3:00 PM	3:15 PM	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM
No. of Vacant Spaces	38	39	33	29	25	27	27	30	31	34	12	10	34	40	43	45
No. of Spaces Occupied	12	11	17	21	25	23	23	20	19	16	38	40	16	10	7	5
% Occupied	24%	22%	34%	42%	50%	46%	46%	40%	38%	32%	76%	80%	32%	20%	14%	10%

Figure 2.23: Car Parking Occupancy Survey Results – Year 7 & 8 Buildings South Car Park

As illustrated in Figure 2.23, during the AM period, the number of occupied car parking spaces increases gradually from 12 (24%) spaces recorded at 8:00am to a peak of 25 (50%) spaces recorded at 9:00am. After this time, the number of car parking spaces occupied falls to 23 (46%) spaces recorded at 9:30am.

During the PM period, the number of occupied car parking spaces increases from 20 (40%) spaces recorded at 2:30pm to a peak of 40 (80%) spaces recorded at 3:30pm. After this time the number of car parking spaces occupied falls rapidly to 5 (10%) spaces recorded at 4:30pm.

It is noted that between 9:30am and 2:30pm, three (3) vehicles (staff) left the car park.

2.4.2.4 Off-street Car Parking Summary

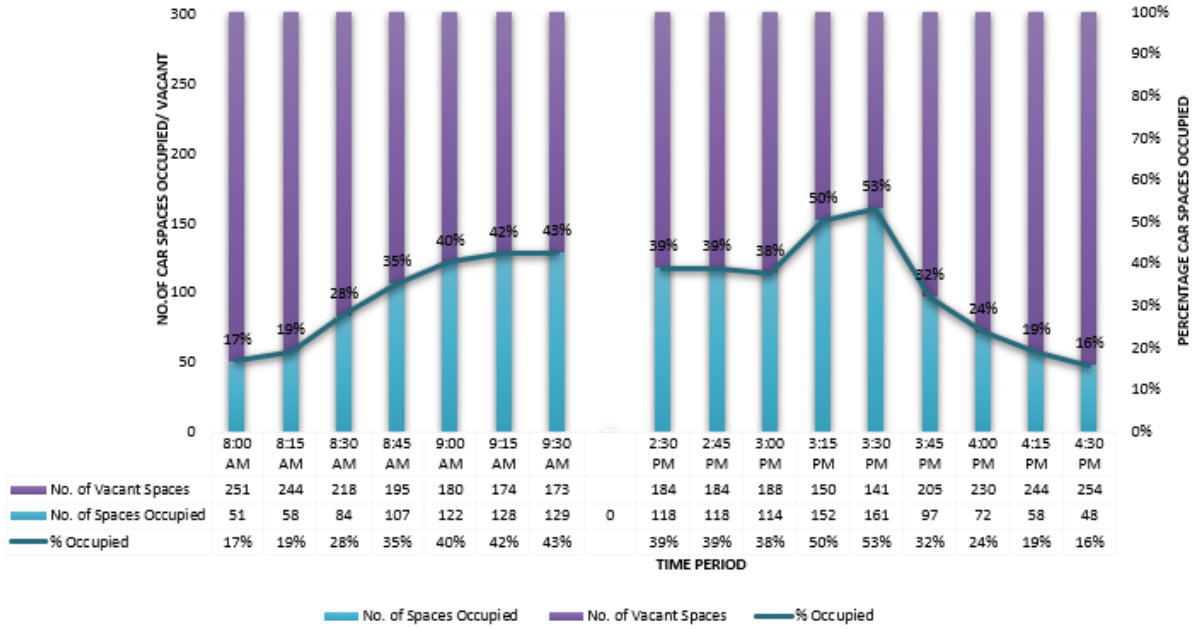
Based on the car parking occupancy survey results, during the AM period, the number of occupied car parking spaces across the college increases gradually from 51 (29%) spaces recorded at 8:00am to a peak of 129 (73%) spaces recorded at 9:00am.

During the PM period, the number of occupied car parking spaces across the college increases from 118 (67%) spaces recorded at 2:30pm to a peak of 157 (89%) spaces recorded at 3:30pm. After this time the number of car parking spaces occupied falls rapidly to 47 (27%) spaces recorded at 4:30pm.

It is noted that between 9:30am and 2:30pm, a total of eleven (11) vehicles (staff) left the car parks across the college.

2.4.2.5 On-Street & Off-street Car Parking Occupancy Survey Summary

Figure 2.24 provides a summary of the car parking occupancy survey results for both the on-street and off-street car parks.



	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM		2:30 PM	2:45 PM	3:00 PM	3:15 PM	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM
No. of Vacant Spaces	251	244	218	195	180	174	173		184	184	188	150	141	205	230	244	254
No. of Spaces Occupied	51	58	84	107	122	128	129	0	118	118	114	152	161	97	72	58	48
% Occupied	17%	19%	28%	35%	40%	42%	43%		39%	39%	38%	50%	53%	32%	24%	19%	16%

Figure 2.24: Car Parking Occupancy Survey Results – Entire College Site

As illustrated in Figure 2.24, during the AM period, the number of occupied car parking spaces increases gradually from 51 (17%) spaces recorded at 8:00am to a peak of 129 (43%) spaces recorded at 9:00am.

During the PM period, the number of occupied car parking spaces increases from 118 (39%) spaces recorded at 2:30pm to a peak of 161 (53%) spaces recorded at 3:30pm. After this time the number of car parking spaces occupied falls rapidly to 48 (16%) spaces recorded at 4:30pm.

Further, during the peak demand for parking a total 19 off-street car parking spaces and 122 on-street car parking spaces were not occupied.

2.4.2.6 Existing Off-Street Car Parking Demand

The total increase in occupied spaces within all four car parks due to parents and visitors is estimated to be approximately 43 car parking spaces in the PM peak period (13 within the eastern car park, 6 within the Emmanuel Centre south car park and 24 car parks within the Year 7 & 8 buildings south car park).

Based on a total of 1,050 students on site at Emmanuel College during the time of the survey, this equates to an off-street car parking demand equivalent to 0.04 visitor car parking spaces per student in the PM peak.

Within all four off-street car parks within the school site, a total of 129 car parking spaces were estimated to be occupied in the AM peak (9:30am) by staff.

Based on a total of 160 staff on site at Emmanuel College during the time of the survey, this equates to a car parking demand equivalent to 0.8 car parking spaces per staff member in the AM peak.

2.5 Transport & Path Network

The Warrnambool City Council Sustainable Transport Travel Map details the footpaths, shared paths, bicycle paths and public transport network within Warrnambool. Refer Figure 2.25 for an extract of the Sustainable Transport Travel Map. As illustrated in Figure 2.25, the college is located approximately a 15 minute bicycle ride or 30 minute walk from the Warrnambool Town Centre.

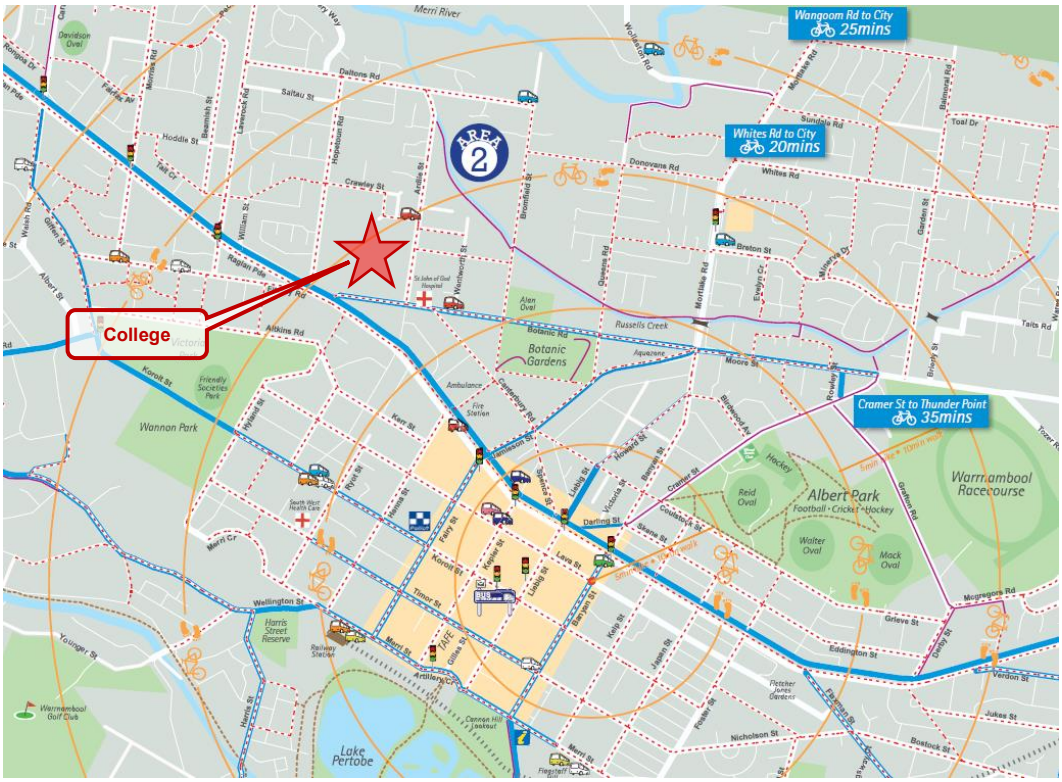


Figure 2.25: Warrnambool Sustainable Transport Travel Map

2.5.1 Public Transport

Bus Route 2 Warrnambool – Gateway Plaza via Centro operates along Crawley Street to the north, Ardlie Street to the east, Botanic Road to the south-east and Hopetoun Road to the north-west of the college. The closest bus stops that service both route directions are located on Ardlie Street, north of the children's crossing and the Eastern Car Park. During school drop off and pick up times, buses arrive and depart these stops at 8:39am and 3:39pm (northbound on Ardlie Street) and 8:45am and 3:45pm (southbound on Ardlie Street).

Bus Route 8 Warrnambool – Port Fairy operates along Raglan Parade to the south-west of the college. The closest bus stop is located at the corner of Raglan Parade and Botanic Road. Buses service this stop approximately every 3 hours. During school drop off and pick up times buses arrive and depart this stop at 3:42pm.

2.5.2 Private College Bus Service

The college currently runs eight (8) private bus services in two (2) waves at the McAuley Campus and two (2) private bus services at the Rice Campus. Details of the Bus service at each campus follows:

- McAuley Campus
    - Bus stops are located on the west side of Ardlie Street north of the Eastern Car Park exit point and the north side of Botanic Road east of the Emmanuel Centre South Car Park access point.
    - In the AM, the first wave of buses arrive at approximately 8:20am and depart straight after students disembark and the second wave of buses arrive at approximately 8:40am and depart straight after students disembark.

- In the PM, the first wave of Buses arrive at 3:20pm and leave at 3:35pm and the second wave of buses arrive at approximately 3:40pm and leaves at 3:50pm.

- Rice Campus
  - Bus stops are located on the west side of Canterbury Road and south side of Bromfield Street.
  - In the AM, buses arrive at approximately 8:30am and depart straight after students disembark.
  - In the PM, buses arrive at 3:30pm and leave at 3:45pm.

2.5.3 Path Network

Referring to Figure 2.25, a 1.5 metre wide bicycle lane is provided on both sides of Botanic Road and Raglan Parade/ Princes Highway to the south of the college. A concrete shared path is also provided along Russells Creek to the north-east of the college between Daltons Road/ Ardlie Street and Garden Street. The bike lanes and shared path form part of the Principal Bicycle Network.

A 1.5 metre wide footpath is provided adjacent to the site on the following roads:

- West side of Ardlie Street and east side of Ardlie Street south of the eastern bus stop.
- Both sides of Botanic Road.
- West side of Hopetoun Road.
- Both sides of Crawley Street east of 5 Crawley Street and on the south side of Crawley Street west of 5 Crawley Street.

2.6 Casualty Crash Statistics

The casualty crash history of the road network adjacent to the college was sourced from the VicRoads' Crashstats database for the period between 24 January 2014 and 24 January 2019. The database indicates that ten (10) casualty accidents occurred as follows:

At the Ardlie Street & Botanic Road roundabout:

- Serious injury crash at 3:30am on 2 March 2014 where a passenger fell from the vehicle. DCA 190. Conditions were dark with street lights on.
- Serious injury crash at 4:50pm on 19 February 2016 where a motorcycle and passenger vehicle collided when driving through the roundabout (cross traffic). DCA 110. Conditions during the day were dry.

At the intersection of Raglan Parade/ Fitzroy Road/ Botanic Road:

- Other injury crash at 7:45am on 16 March 2015 where a vehicle heading through the intersection collided with a vehicle turning right. DCA 121. Conditions at dawn were dry.
- Serious injury crash at 9:10pm on 11 November 2016 where a vehicle drove off the carriageway and collided with a fence and pole. DCA 173. Conditions were dry and dark with street lights on.
- Other injury crash at 12:10pm on 4 December 2017 where a vehicle drove off the carriageway and collided with a signage post. DCA 183. Conditions during the day were dry.
- Serious injury crash at 2:05pm on 19 September 2018 where a cross traffic collision occurred between a passenger vehicle and light commercial vehicle. DCA 110. Conditions during the day were dry.
- Other injury crash at 5:13pm on 21 March 2018 where a cross traffic collision occurred between a passenger vehicle and utility vehicle. DCA 110. Conditions during the day were dry.
- Serious injury crash at 7:05pm on 18 February 2019 where a cross traffic collision occurred between a motorcycle and passenger vehicle. DCA 110. Condition during the day were dry.

At the intersection of Hopetoun Road & McPherson Crescent:

- Other injury crash at 12:35pm on 17 October 2015 where a vehicle heading through the intersection collided with a vehicle turning right at the intersection. DCA 113. Conditions during the day were dry.

At the intersection of Raglan Parade & Hopetoun Road:

- Serious injury crash at 9:35am on 7 March 2016 where a rear end collision occurred. DCA 130. Conditions during the day were dry.

Considering that all crashes occurred outside of the school drop off and pick up periods (8-9:30am and 2:30-4pm), it can be concluded that the school drop off and pick up traffic is not contributing to these crashes. Therefore, there are no serious safety concerns with the existing roads adjacent to the school site during school drop off pick up times.

3 BACKGROUND TRANSPORT REVIEW

3.1 Warrnambool Strategic Framework Plan

Clause 02-03 of the Warrnambool Planning Scheme details the Planning Scheme requirements specific to the Warrnambool Strategic Framework Plan. Refer to Figure 3.1 for a copy of the Warrnambool Strategic Framework Plan as taken from Clause 02-04 of the Planning Scheme.

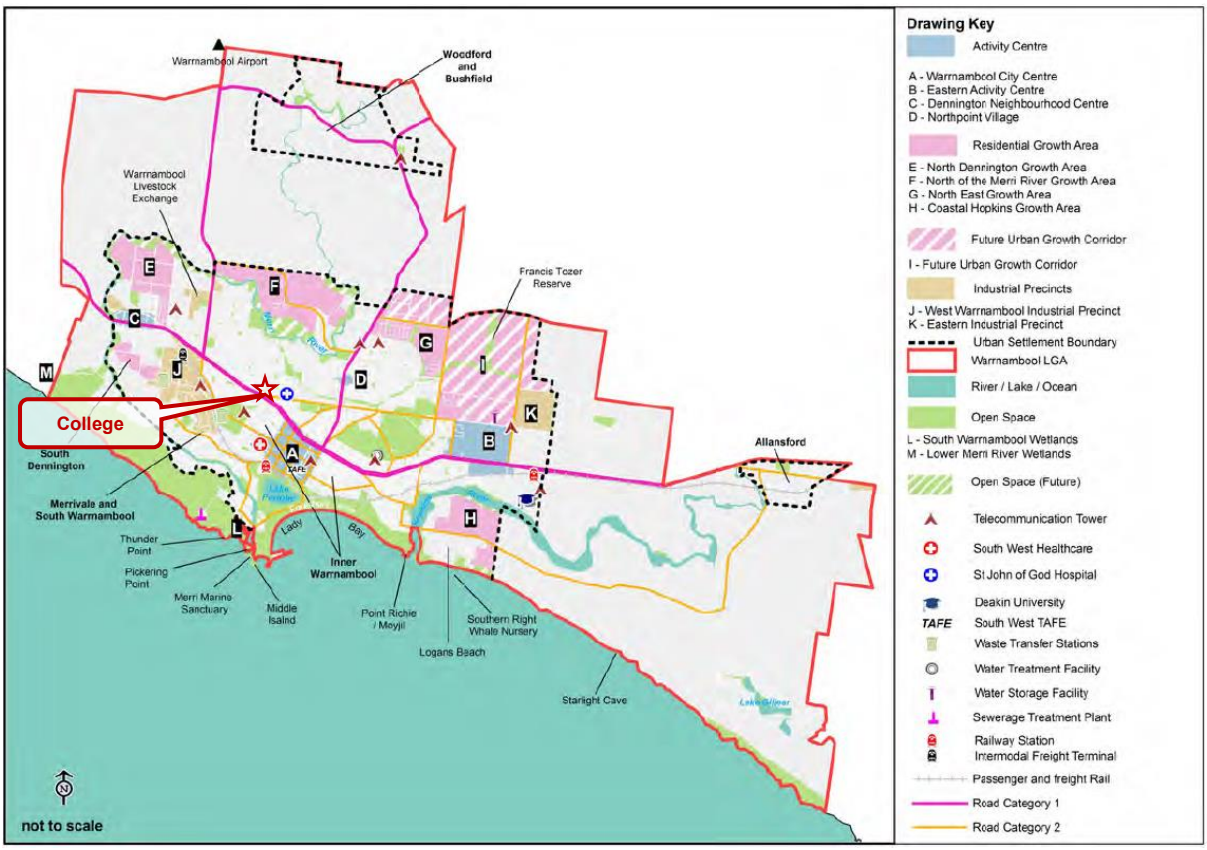


Figure 3.1: Warrnambool Strategic Framework Plan

As illustrated in Figure 3.1, the site is located to the north of the Warrnambool City Centre. The St John of God Hospital and a Road Category 2 is located directly east and south of the site respectively. Princes Highway/ Raglan Parade to the south of the site is a Road Category 1.

From a transport perspective, there are no objectives and strategies outlined in Clause 02-03 of the Planning Scheme that are specifically related to the site.

3.2 Botanic Precinct Local Area Traffic Management Plan

Safe System Solutions Pty Ltd was engaged by Warrnambool City Council to prepare a Local Area Traffic Management Plan (LATM) for the Botanic Precinct within Warrnambool. The LATM aims to address the travel challenges that the local community faces, propose cost-effective solutions to improve safety and road congestion, and create safer streets for all road users.

Refer Figure 3.2 for an extract of the map of the potential LATM infrastructure changes within the Botanic Precinct.

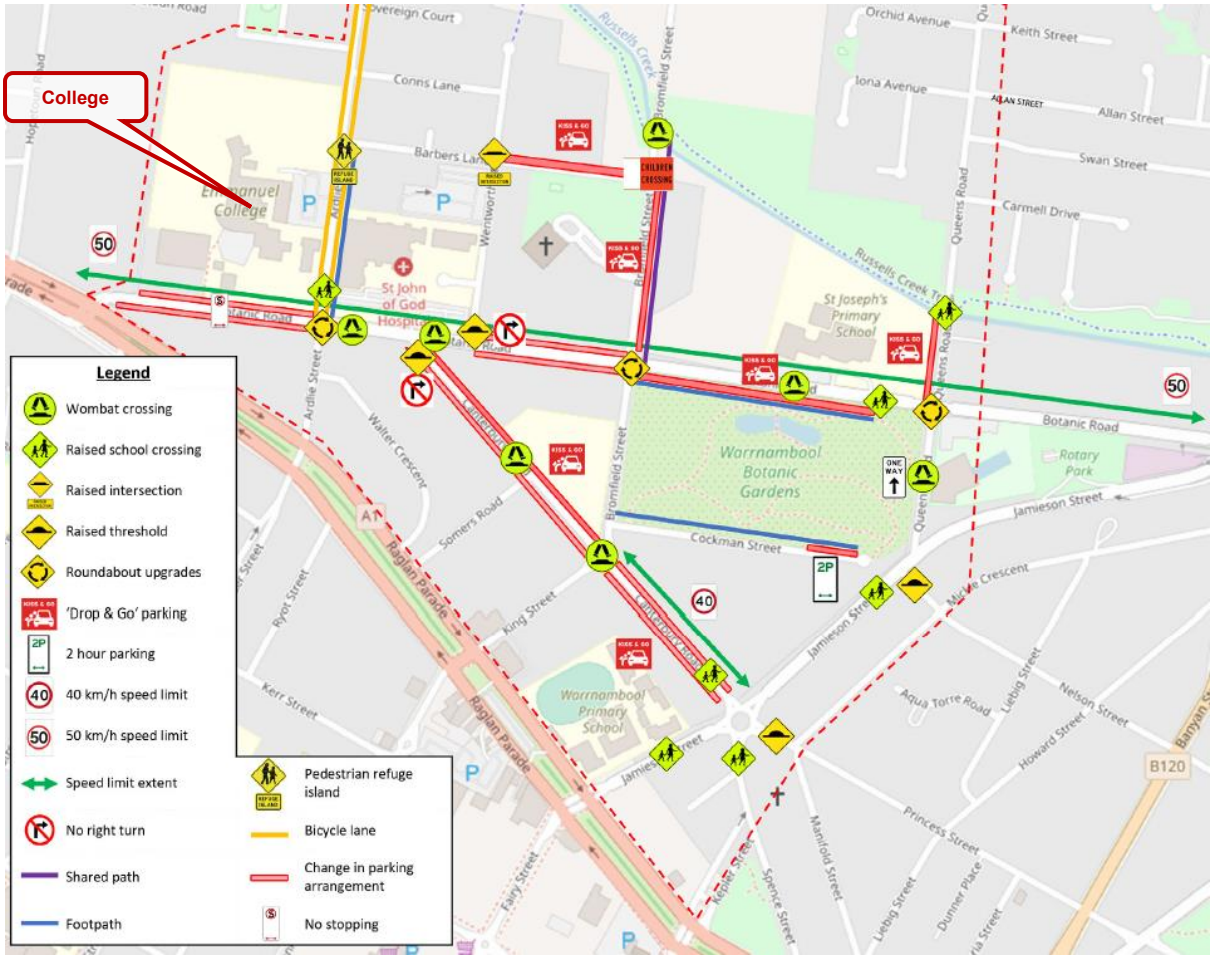


Figure 3.2: Botanic Precinct LATM Infrastructure Changes Map

Referring to Figure 3.2, the following LATM projects are proposed adjacent to the college:

- Pedestrian refuge island on Ardlie Street south of Barbers Lane.
- Convert the existing school crossing on Ardlie Street to a raised school crossing.
- Implement on-road bicycle lanes on Ardlie Street north of Botanic Road.
- Construct a footpath on the east side of Ardlie Street between Barbers Lane and Botanic Road.
- Replace the existing pedestrian refuge island at the Botanic Road/ Ardlie Street eastern approach with a wombat crossing.
- Upgrade the Botanic Road/ Ardlie Street roundabout to have raised platforms on all approaches to the roundabout, enlarge the central island and install kerb outstands.
- Install no stopping signs on Botanic Road between Raglan Parade/ Princes Highway and Ardlie Street to stop parked vehicles obstructing the bicycle lanes.
- Reduce the speed limit on Botanic Road to 50km/h from 60km/h outside of school hours.

All proposed LATM projects are supported, however it is recommended that the following also be adopted:

- Extend the 40km/h speed limit during school hours on Botanic Road up to Raglan Parade/ Princes Highway.
- Reduce the speed limit on Ardlie Street to 50km/h from 60km/h outside of school hours and extend the 40km/h speed limit during school hours on Ardlie Street to the north along the college boundary.

3.3 Botanic Road Western Access Point Intersection

The existing Botanic Road/ Botanic Road Western Access Point intersection currently operates as a left-in/ left-out only intersection with double solid lines along Botanic Road adjacent to the intersection. However, as per the traffic volume survey results as illustrated in Figure 2.13, it has been observed that a high number of vehicles turn right-in into the site (67 vehicles during the AM Peak Period) and a low number of vehicles turn right-out of the site (12 vehicles during the PM Peak Period).

As part of the initial masterplan for the site (2012), the Botanic Road western access point intersection was analysed by GTA Consultants (now Stantec) in their Traffic Impact Assessment Report for the masterplan development. Further, discussions were undertaken with both Council and the Department of Transport regarding the permitted movements at this intersection as follows (Refer Appendix C for a copy of these documents):

1. GTA Consultants Traffic Impact Assessment Report:

   A traffic impact assessment report dated December 2012 was prepared by GTA Consultants for the initial masterplan of Emmanuel College which provided advice on traffic and transport matters associated with the development of the masterplan.

   The report concluded that the configuration of the Botanic Road western access point should consist of both right and left turn entry movements and left turn only exit movements due to the issues that would arise from restricting right turn entry movements such as the increase in concentration of traffic at the Raglan Parade/ Fitzroy Road/ Botanic Road intersection.

2. Department of Transport (VicRoads):

   On 7 May 2013, the DoT provided Warrnambool City Council with comments regarding the Botanic Road western access point intersection which has been summarised below:

   a. The proposal to create an access to the college from Botanic Road, 60 metres from Raglan Parade may have potential to cause undue stress on the Raglan Parade/ Botanic Road intersection.

   b. The potential stress would be exacerbated by the implementation of left-in/ left-out only traffic movements as all traffic entering the access point will have to approach via the Raglan Parade/ Botanic Road intersection.

   c. DoT (VicRoads) believes that right turn entry should be permitted with only left turn exit movements at the access point.

3. Warrnambool City Council:

   On 24 May 2013, Warrnambool City Council stated that a road safety audit would be required to be undertaken on the proposed access point which was to be designed to provide for the following:

   a. Left turn exit only onto Botanic Road, no right turn exit from college land into Botanic Road will be permitted.

   b. Right turn and left turn entry into the college land will be permitted.

4. Feasibility Stage Road Safety Audit – Proposed Site Access Road from Botanic Road:

   Brian Consulting Pty Ltd completed a road safety audit dated 5 November 2013 as requested by Warrnambool City Council for the proposed access road from Botanic Road permitting right-in, left-in and left-out movements only.

   Key findings of the road safety audit are as follows:

   a. Sight distances at the intersection are adequate for both the east and west directions.

   b. Provision of a left turn exit only from the access road will direct all traffic to the east towards the Ardlie Street/ Botanic Road roundabout. Traffic wishing to travel to the west may make either a U-turn at the roundabout or turn right into Ardlie Street to Raglan Parade which are both considered to be adequate and safe manoeuvres.

   c. The proposal will have minimal effect on the overall road network.

d. The expected queuing of traffic at the Raglan Parade/ Botanic Road intersection on Botanic Road is not expected to restrict right turn entry into the access road during peak times.

e. The layout has been checked for access and turning of both cars and buses and found to be adequate.

f. As the surrounding area is fully developed, it is not expected that there will be large unforeseen changes in traffic volumes or characteristics.

5. Planning Permit No. P2014-007:

   A Planning Permit was issued on 15 April 2014 by Warrnambool City Council for the construction of a multi-purpose hall and access road. Condition 10e of the planning permit states that the intersection of the new access road and Botanic Road should have:

   i) a left turn entry and left turn exit only with Botanic Road from the development, and

   ii) no public access active pick-up/ drop-off activities are to be undertaken.

Based on the above, the Botanic Road Western Access Point had in principle approval from the DoT (VicRoads) and Warrnambool City Council to permit right-in/ left-in/ left-out only movements which was also supported by a road safety audit. However, the planning permit has restricted the access point to left-in/ left-out only movements, contrary to the DoT's and Council's internal advice.

Reviewing historical aerial photography, it is noted that the double solid lines were installed on Botanic Road sometime mid to late 2017, well after the construction of the access point.

As drivers are currently performing a right turn movement into the site at the access point and there is no history of accidents occurring at the access point during school drop off and pick up times and considering the DoT's safety concerns associated with increasing traffic at the Raglan Parade/ Botanic Road intersection, it is recommended that a break in the double solid lines be provided adjacent to the access road entry to allow right turn entry into the site.

4 PROPOSED DEVELOPMENT

4.1 Development Plan

The proposed development consists of expanding Emmanuel College at 140 Botanic Road, Warrnambool (McAuley Campus) to cater for a total of 1350 students due to the relocation of the year 11 and 12 students (completed in 2022) and year 9 students (expected 2025) from the Rice Campus to the McAuley Campus and a total of 185 staff on site at any one time. The proposed expansion is expected to occur over four stages as follows:

- Stage 1 & 1A: Construction of[4]:
  - A Year 9 Centre including 10 classrooms, shared spaces, specialist spaces, gathering areas and new staff car park from Crawley Street with capacity for 19 car parking spaces[5].
  - Two new staff car parks with capacity for up to 40 car parking spaces over the unused courts fronting Botanic Road.
  - One hundred & twenty-four (124) car parking spaces (74 staff spaces & 50 students) on the west side of the site with access from Hopetoun Road.
  - A new visitor drop-off/ pick-up zone with capacity for a total of 54 car parking spaces adjacent to the Emmanuel Centre.
  - A bus parking zone with capacity for two buses.
  - A maintenance shed.
- Stage 2: Construction of a new teaching wing, food technology spaces and shared collaboration spaces within the McAuley Campus for year 7 and 8 students.
- Stage 3: Construction of a new two-storey senior learning and arts centre building.
- Stage 4 (Full Development): Construction of a swimming pool facility and Sports & Health Centre and the removal of the existing Emmanuel College Building E & F South Car Park.

Emmanuel College operates Monday to Friday between 8:00am and 4:30pm.

Refer Figure 4.1 below for the Proposed Masterplan of the college at full development. Refer Appendix D for the Proposed Masterplan (Full Development).

[4] As detailed in Section 1.1, a Planning Permit and Endorsed Plan was issued on 13 June 2023 for the construction of the western off-street car park, bus parking zone, visitor drop-off/ pick-up zone, east-west accessway and Hopetoun Road access point which was completed in early 2024.
[5] The Year 9 Centre located adjacent to Crawley Street will be subject to a separate planning permit application.

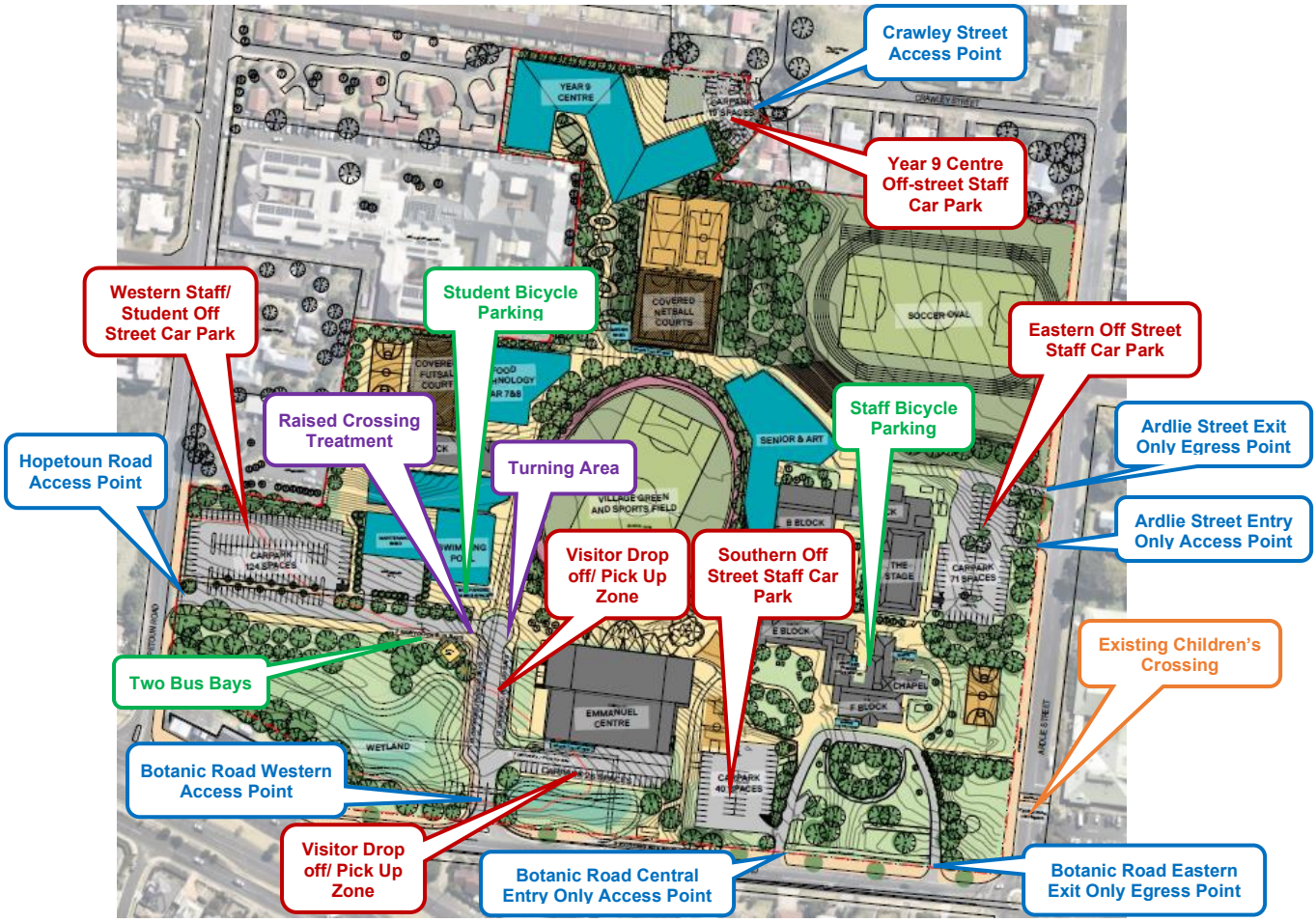


Figure 4.1: Proposed Masterplan (Full Development)

4.2 Access & On-Site Circulation

4.2.1 Vehicular Access

Vehicle access to the site is provided via the three existing access points (1 No. Ardlie Street and 2 No. Botanic Road, refer Section 2.2) and two proposed new access points; one on Hopetoun Road for all vehicles and one on Crawley Street for staff, general maintenance, and delivery vehicles only. Details of the new access points are provided below.

- Hopetoun Road:

  A two-way 6.0 metre wide access point is proposed approximately 60 metres south of McPherson Crescent. This access point connects to a 6.0 metre wide east-west aligned accessway which services the new western off-street car park, two bus bays and the maintenance shed. This access point will be used by staff and students who drive to the school, maintenance and waste collection vehicles, and buses (exit only).

- Crawley Street:

  A two-way 3.3 metre wide access point is proposed at 13 Crawley Street. This access point connects to a 3.6 metre wide north-east to south-east aligned accessway which services the Year 9 Centre off-street car park.

Once stage one is constructed, the internal north-south aligned accessway from Botanic Road and the east-west aligned accessway from Hopetoun Road will connect at a turnaround area located to the north-east of the Emmanuel Centre. Vehicles accessing the drop off/ pick up zone will be required to use the turnaround area to exit the site at Botanic Road.

The western leg of the turnaround area will be restricted to buses and the odd school maintenance vehicles only (one-way westbound) and designed as a raised crossing treatment. Signage will also be

provided to re-affirm that visitors are not allowed to access the east-west aligned accessway from the turnaround area. Refer Section 5.2.2 for further details on recommended signage.

The access points are to be constructed as concrete vehicle crossovers and are to match the proposed levels on Hopetoun Road and Crawley Street.

4.2.2 Bus Access

Two bus parking bays (sawtooth layout) are provided within the site on the south side of the east-west aligned accessway directly west of the turnaround area. These bus bays will cater for the relocation of two existing bus routes currently utilising the on-street bus zones and/ or an additional two new bus routes subject to student demand.

Buses will enter the site from Botanic Road, turn left into the east-west aligned accessway at the turnaround area, and park within the bus parking bays. The bus will then exit the bus bay in a forward direction, drive west down the east-west aligned accessway and exit the college via Hopetoun Road.

Refer to Appendix E for the Swept Path Assessment drawing no. 22001EC-00-301 & 302 for a 12.5m long HRV (bus) entering, exiting, and circulating the college and parking within the bus parking bays.

4.2.3 Waste Collection Vehicle Access

Waste collection points are proposed around the college as follows:

- On the north side of the A Block building (existing).
- North of the Chapel (existing).
- South of the F Block building (relocated from the existing location south of the E Block building).
- South of the Emmanuel Centre (proposed).
- East of the swimming pool facility (proposed).
- South of the of the Year 9 Centre and covered netball courts (proposed).

A few 120L bins will be placed along the accessway by maintenance staff prior to a waste collection vehicle arriving at the college. A waste collection vehicle will enter the college from the closest access point to each respective waste collection point and empty each bin before driving to the next waste collection point. The waste collection vehicle may be required to exit the college to access each waste collection point.

Refer to Appendix E for the Swept Path Assessment drawing no. 22001EC-00-302 to 304 for an 8.8m long MRV entering the college and completing waste collection at the new waste collection locations.

For safety reasons, it is recommended that waste collection services occur any time prior to 8:00am, or after 4:00pm weekdays, or anytime on weekends and non-school days.

The waste collection service and the location of the waste collection points are adequate from a traffic engineering perspective.

4.2.4 Maintenance/ Delivery Vehicle Access

The existing Maintenance Shed and Colourbond Shed in the north of the college will be removed and a new Maintenance Shed and hard standing area is proposed to be constructed on the north side of the east-west accessway between the western off-street car park and swimming pool facility. The existing Agriculture Shed and Garden Shed west of the covered netball courts will remain.

The Maintenance Shed will be accessed by school maintenance vehicles (utes, lawn mowers, etc.) and external maintenance and delivery vehicles up to 12.5m long (HRV).

All internal school maintenance vehicles (lawn mowers, utes, etc.) will access the Maintenance Shed via the turnaround area. All external maintenance/ delivery vehicles will access the college via Hopetoun Road. These vehicles will drive eastbound along the east-west accessway, drive into the hard standing area via the access point, and then park adjacent to this building within the designated loading area. The maintenance/ delivery vehicles will then exit the Maintenance Shed and hard standing area in a forward direction, drive west down the east-west aligned accessway and exit the college via Hopetoun Road.

General maintenance vehicle and delivery vehicle access to the Year 9 Centre is provided from Crawley Street. A 6.4m long SRV will drive along the north-east to south-west aligned accessway and then turn left into car park accessway and then reverse back into the loading/ unloading area. The vehicle will then exit the college in a forward direction via Crawley Street. Refer to Appendix E for the Swept Path Assessment drawing no. 22001EC-00-304 illustrating a 6.4m long SRV entering and exiting the college site from/ to Crawley Street and circulating adjacent to the Year 9 Centre.

For safety reasons, it is recommended that maintenance/ delivery vehicle access to the site is restricted to prior to 8:00am, between 9am and 3pm, or any time after 4:00pm school days, or anytime on weekends and non-school days.

The proposed location of the access points including bus, waste collection and maintenance vehicle access and on site circulation are adequate from a traffic engineering perspective.

4.2.5 Pedestrian & Cyclist Access & Internal Circulation

Pedestrian and cyclist access to the site is provided via the two existing access points (1 No. Ardlie Street and 1 No. Botanic Road, refer Section 2.2) and two proposed new access points (1 No. Botanic Road and 1 No. Hopetoun Road). Details of the new access points are provided below.

- Botanic Road – A 2.5 metre wide pedestrian/ cyclist access point is provided adjacent to the Botanic Road western access point which connects to the path along the drop-off/ pick-up zone.
- Hopetoun Road – A 2.5 metre wide pedestrian/ cyclist access point is provided at the site's western boundary north of the Hopetoun Road access point. This pedestrian/ cyclist connection will run along the southern section of the western car park, connect into the internal path network within the college and leads to the bicycle parking area.

A 1.4 metre wide and 2.5 metre wide footpath is provided on the east and west side of the proposed school drop off/ pick up spaces respectively, a 2.5 metre wide footpath is provided on the south side of the bus parking bays, and a varying width footpath is provided on the north side of the east-west aligned accessway. All proposed paths connect to the existing and proposed internal college path network and to the new Botanic Road and Hopetoun Road pedestrian and cyclist access points.

A 4.0 metre wide raised pedestrian crossing is provided directly west of the vehicle turning area. The raised pedestrian crossing provides a connection between the drop-off/ pick-up zone, the bus parking bays and the college buildings.

It is recommended that a footpath be provided on the east side of Hopetoun Road along the school frontage and connect into the existing footpath network to the north and south.

The location of all pedestrian and cyclist access points are adequate.

Further, the existing path network located external to the college allows safe and convenient access to the college via walking and cycling modes for students and residents.

4.3 Parking Provisions

4.3.1 Car Parking

4.3.1.1 Off-street Car Parking

- Stage 1:

The existing Eastern Car Park and Emmanuel College Building E & F South Car Park are proposed to remain during Stage 1 of the development, however, will be designated for staff use only. The access point into these car parks will be sign posted accordingly. Details of each car park follows:

- Existing Eastern Car Park - 71 No. 90 degree angled car parking spaces including two accessible car parking spaces for disabled users.
- Emmanuel College Building E & F South Car Park - 34 No. 45 degree angled car parking spaces including one accessible car parking space for disabled users.

The existing Year 7 & 8 buildings south car park is proposed to be removed, and the existing drop-off/ pick-up area west of the Emmanuel Centre is proposed to be demolished and reconstructed with 27 No. 45 degree angled car parking spaces (12 No. car parking spaces on the east side and 15 No. car parking spaces on the west side). These car parking spaces will be signposted as a drop-off/ pick-up zone for parent/ visitor use.

The existing Emmanuel Centre south car park is proposed to be converted into a drop-off/ pick-up zone. An additional five 90 degree angled car parking spaces (two to the east and three to the west of the existing spaces) are proposed to be constructed. One parallel car parking space is also proposed on the north side of the accessway servicing this car park. A total of 27 car parking spaces will be provided for parent/ visitor use.

Three new car parks are proposed to be constructed during Stage 1 of the development. Details of each car park follows:

- Southern off-street staff car park - New staff only off-street car park with capacity for 40 No. 90 degree angled car parking spaces will be constructed to the south of the Emmanuel College Buildings E and F over the old courts. Access to this car park will be via a 4.2 metre wide access point located directly north of the Botanic Road Central Access Point. The access point into this car park will be sign posted accordingly.
- Western off-street car park - New off-street car park with capacity for up to 124 car parking spaces including one accessible car parking space for disabled users will be constructed to the east of Hopetoun Road, north of the east-west aligned accessway. This car park is proposed to be used by staff and students who drive to the college. The access point into this car park will be sign posted accordingly.
- Year 9 Centre off-street car park - New off-street car park with capacity for up to 19 car parking spaces will be constructed adjacent to the Year 9 Centre. Access to this car park will be via a 3.6 metre wide access point located at the Crawley Street 90 degree bend. This car park is proposed to be used by staff only. The access point into this car park will be sign posted accordingly.

Therefore, a total of 342 car parking spaces will be provided within the college during Stage 1 of the development.

- Stage 2 and 3:

No car parking changes are proposed in Stage 2 and Stage 3 of the development.

- Stage 4 (Full development):

The existing Emmanuel College Buildings E and F south car park with capacity for up to 34 No. car parking spaces will be removed.

No other car parking changes are proposed in Stage 4 of the development.

Therefore, once the site is fully developed, a total of 308 off-street car parking spaces will be provided within the college.

4.3.1.2 On-street Car Parking

As detailed in Section 2.4.2, on-street car parking is provided on Ardlie Street, Botanic Road and Hopetoun Road adjacent to the college for parents to drop off and pick up their children.

Considering that the parking on Botanic Road will be restricted to No Stopping (refer Section 3.2, LATM recommendation), a total of 80 No. on-street car parking spaces will be available for parents and visitors of the college if required.

4.3.2 Bike Parking

A bicycle parking area with capacity for 156 bicycles via 78 bicycle hoops is provided for student use south of the swimming pool facility. Access to the bicycle parking area is provided via the paved area adjacent to the college buildings. The bicycle parking area will be provided in Stage 2 of the development.

A bicycle parking area with capacity for 9 bicycles via 5 bicycle hoops is provided for staff use within the college building between the E block and F block. It is understood that this bicycle parking area will be lockable. A shower for staff use is provided within the Emmanuel Centre, within the McAuley staffroom and within the G block building.

5 PARKING ASSESSMENT

5.1 Car Parking Requirement

Clause 52.06 of the Warrnambool Planning Scheme details the car parking requirement in accordance with State and Local Planning Policy for a proposed new use or a proposed change in existing use within the City of Warrnambool. Clause 52.06-5, Table 1 sets out the number of car parking spaces required for a particular use. For a Secondary School use, the car parking requirement is 1.2 spaces to each employee that is part of the maximum number of employees on site at any time.

Therefore, the car parking requirements are set out in Table 5.1.

Table 5.1: Car Parking Requirement

Use	Rate & Measure	Stage	Quantity	No. of Spaces Required
Secondary School	1.2 spaces to each employee that is part of the maximum number of employees on the site at any time	1 (Year 9 Centre)	175 employees on site at any time	210
Secondary School	1.2 spaces to each employee that is part of the maximum number of employees on the site at any time	2, 3 & 4 (Full Development)	185 employees on site at any time	222

As detailed in Table 5.1, the college has a statutory car parking requirement equivalent to 210 car parking spaces at Stage 1 (Year 9 Centre) and 222 car parking spaces at Stages 2 to 4 (full development).

Therefore, the provision of:

- 342 car parking spaces at Stage 1 of the college development exceeds the statutory car parking requirement by 132 car parking spaces.
- 342 car parking spaces at Stage 2 to 3 of the college development exceeds the statutory car parking requirement by 120 car parking spaces.
- 308 car parking spaces at Stage 4 (full development) exceeds the statutory car parking requirement by 86 car parking spaces.

5.2 Design Standards for Car Parking

The car park and access layout has been assessed against the requirements of the Warrnambool Planning Scheme Clause 52.06-9, the Australian/ New Zealand Standard for off-street car parking (AS/NZS 2890.1:2004), and the Australian Standard for off-street parking for people with disabilities (AS/NZS 2890.6:2009).

5.2.1 Accessway & Car Parking Space Dimensions

The Hopetoun Road access point has been designed to cater for a 12.5 metre long HRV exiting the college and an 8.8 metre long MRV entering the college. The accessway connecting to the Hopetoun Road access point is 6.0 metres wide.

The Crawley Street access point has been designed to cater for a 6.4 metre long SRV entering and exiting the college. The proposed Crawley Street vehicle crossing has been designed in accordance with the Infrastructure Design Manual, however the splay on the northern side of the vehicle crossing is not proposed to be constructed to provide additional clearance to the existing power pole. Further, a SRV is not expected to turn left to the west side of the existing tree located centrally within the Crawley Street court bowl.

Details of all other car parks follows:

1. Eastern Off-street Car Park (Existing):

Passenger vehicle access to this car park is provided from the existing Ardlie Street 3.5 metre wide entry and 5.0 metre wide exit point. Both access points connect to an existing 6.4 to 7.0 metre wide accessway.

All existing 71 No. 90 degree angle car parking spaces including the two accessible car parking spaces for disabled users and shared area measures 5.2 metres long by 2.6 metres wide.

2. Southern Off-street Car Park:

   Passenger vehicle access to this car park is provided from the existing Botanic Road Central Entry Point accessway via a 4.2 metre wide access point. The access point connects to a 7.5 metre wide accessway which circulates the car park.

   All 40 No. 90 degree angle car parking spaces measure 5.2 metres long by 2.6 metres wide.

3. Emmanuel Centre Drop-off/ Pick-up Zone:

   Passenger vehicle access to the Emmanuel Centre drop-off/ pick-up zone is provided from the existing Botanic Road western access point. The access point connects to an existing 8.0 metre wide accessway which then narrows to 7.0 metres wide adjacent to the 45 degree angled car parking spaces.

   The 27 No. 45 degree angled drop-off/ pick-up car parking spaces to the west of the Emmanuel Centre measure 4.9 metres long by 2.6 metres wide whereas the existing and proposed 26 no. 90 degree angled drop-off/ pick-up car parking spaces and one parallel drop-off/ pick-up car parking space to the south of the Emmanuel Centre measure 5.2 metres long by 2.6 metres wide and 6.7 metres long by 2.3 metres wide respectively. The existing accessway servicing the car parking spaces to the south of the Emmanuel Centre is 6.2 metres wide.

4. Western Car Park:

   Passenger vehicle access to the western car park is provided from the east-west aligned accessway via a 6.4 metre wide one-way entry point. The one-way entry point connects to a 6.4 metre wide accessway which circulates the car park. The exit point from the car park is one-way only and is located at the eastern end of the car park.

   The 124 No. 90 degree angle car parking spaces measure 4.9 metres long by 2.6 metres wide including one accessible car parking space for a disabled user and shared area. As per the Warrnambool Planning Scheme, the disabled car parking spaces may encroach into the accessway width by 500mm.

5. Year 9 Centre Off-street Car Park:

   Vehicle access to/ from the Year 9 Centre off-street car park is provided from Crawley Street via a 3.3 metre wide access point. The access point connects to a 3.6 metre wide accessway which provides access to the Year 9 Centre off-street car park.

All car parking space dimensions, accessway widths and access point widths meet the requirements of the Warrnambool Planning Scheme and the Australian Standards.

The shared areas adjacent to all accessible car parking spaces are to be line marked as per the AS/NZS 2890.6:2009 - Parking facilities, Part 6: Off-street parking for people with disabilities, with a bollard provided adjacent to the accessway. The accessible car parking space is to be sign posted and line marked so that it is easily identifiable upon entry into the college.

5.2.2 Safety

The following recommendations are made to improve safety within the site:

- As detailed in Section 4.2.1, to prevent parents, visitors, and local traffic from using the east-west aligned accessway, the following signage is to be installed:
  - Hopetoun Road Access Point - “Staff, Student, Bus & Maintenance Vehicle Access Only” signage.
  - East-west accessway
    - West of the bus parking bays - “School Maintenance Vehicle Access Only” signage facing west.

  - East of the raised crossing - “Bus & School Maintenance Vehicle Access Only” signage facing east towards the turning area.
  - South of the Turnaround area – “No Left Turn, Buses & School Maintenance Vehicle Excepted” signage facing approaching traffic.
- “Staff & Student Parking Only” signage be provided at the western car park access point and “Staff Parking Only” signage be provided at the eastern car park, southern car park, and Year 9 Centre car park access points.
- “Drop-off/ pick-up zone” adjacent to the Emmanuel Centre car parks.
- “No stopping” signage be provided around the drop-off/ pick-up zone turning area.
- “Zebra” crossing signage be provided at the raised crossing west of the turnaround area.
- All landscaped areas located adjacent to the pedestrian crossing points and the circulation road intersections have vegetation that is less than 900mm in height so as not to obstruct driver and pedestrian sightlines.
- The Hopetoun Road access point be provided with a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent exit lane, or adjacent landscaped areas, provided the landscaping in those areas is less than 900mm in height.

Further, it is also recommended that the following works occur at the existing Botanic Road Western Access Point immediately to allow the right turn movement into the site and to re-enforce the prohibition of the right turn movement out of the site:

- The addition of extra line marking and a left turn pavement arrow adjacent to the median island to re-enforce the left turn only movement.
- The addition of a “No Right Turn at Botanic Road” signage (R2-V126(R)) installed within the site on the approach to Botanic Road.
- Provide a break in the double solid lines on Botanic Road adjacent to the entry lane to allow for vehicles to turn right into the access point.

It is recommended that a 40km/h speed limit during school times be implemented on Hopetoun Road due to the provision of a new pedestrian/cyclist access point.

It is understood that the off-street car parks will have lighting in accordance with the Australian Standards. This will be detailed during the design phase of the project.

5.3 Bicycle Facilities

Clause 52.34 of the Warrnambool Planning Scheme details the requirement for Bicycle Facilities in accordance with State and Local Planning Policy for a proposed new use or a proposed change in existing use within the City of Warrnambool.

5.3.1 Bicycle Facilities Requirement

Clause 52.34-5, Table 1 sets out the minimum number of bicycle spaces required for a particular use. For the proposed Secondary School use, the statutory bicycle space requirement is 1 employee space to each 20 employees, and 1 visitor space to each 5 pupils.

It is understood that the college will have 1350 students and 185 staff on site at any one time after Stage 2 of the college development. Therefore, based on the planning scheme, the proposed college will have a statutory bicycle parking requirement equivalent to 270 Bicycle parking spaces for the college students and 9 Bicycle parking spaces for staff.

Therefore, in accordance with the Warrnambool Planning Scheme, a total of 270 student bicycle parking spaces and 9 staff bicycle parking spaces are to be provided at Stage 2 of the college development.

The provision of nine bicycle parking spaces via 5 bicycle hoops for staff use within the college building between the E & F blocks meets the requirements of the Warrnambool Planning Scheme, where-as the

provision of 156 bicycle parking spaces via 78 bicycle hoops for student use does not meet the requirement of the Warrnambool Planning Scheme.

As per the travel data received from the college, approximately 40 students of the current 1,050 students currently cycle to the college. Extrapolating this to the expected 1,350 student enrolment at full development, it is expected that approximately 51 students will ride to school.

Therefore, the provision of 156 bicycle parking spaces via 78 bicycle hoops for student use is a more than acceptable bicycle provision for the college site at full development.

Further, as more than five employee bicycle spaces are required, a shower and change room facility are to be provided on-site for staff use. Therefore, the provision of a shower and change room facility within the Emmanuel Centre, McAuley staffroom and within the G block building exceeds the requirements of the planning scheme.

5.3.2 Design of Bicycle Spaces

In accordance with Clause 52.34-6, all proposed bicycle parking hoops are to provide a bicycle parking space equivalent to 1.8 metres long and 1.0 metre wide between the rails. The access path/clear area in front of the rails is to be at least 1.5 metres wide to allow ease of access into the bicycle parking space. Further, all bicycle rails are to be:

- Securely fixed to the ground.
- Allow a cyclist to easily lock the bicycle frame and wheels.

The proposed location of the bicycle parking area:

- Provide convenient access to and from the main building entrance(s).
- Do not interfere with access to doorways, pedestrian paths, and car parking spaces.
- Do not cause a hazard to bicycle users and other users of the site.

The design of the bicycle parking facilities is in accordance with the Warrnambool Planning Scheme.

6 TRAFFIC ASSESSMENT

As detailed in Section 4.3, at full development the following modifications will have occurred to the existing car parks:

- Eastern Car Park – Converted the existing 71 No. staff/ visitor car park to a staff only car park. No changes are proposed to the existing car parking provision.
- Emmanuel College Building E & F South Car Park – Removal of the 34 existing car parking spaces, and the construction of 40 new car parking spaces (southern staff car park) over the existing courts.
- Emmanuel Centre South Car Park & Year 7 & 8 Buildings South Car Park – Removal of 62 car parking spaces, the construction of a 32 new drop off/ pick up car parking spaces and conversion of the existing 21 Emmanuel Centre south car parking spaces to drop-off/ pick-up spaces (Visitor drop-off pick up zone).

Further, an additional 124 staff/ student car parking spaces will be provided in the Western off-street car park and 19 staff car parking spaces in the Year 9 Centre off-street car park.

As the Eastern Car Park will experience a drop in traffic in the peak 30 minute time period due to the removal of visitor parking and the southern car park will not experience an increase in traffic even though an extra six staff car parking spaces have been provided in this location, i.e. staff will arrive and leave before and after the peak 30 minute time period respectively, an assessment of these access points will not be completed.

Further, as the Year 9 Centre off-street car park is not expected to have a detrimental impact on the operational performance of Crawley Street i.e. staff will arrive and leave before and after the peak 30 minute time period, an assessment of the Crawley Street access point will not be completed.

Therefore, an intersection assessment of the Botanic Road/ Botanic Road Western Access Point, the Hopetoun Road/ Hopetoun Road Access Point, and the Botanic Road/ Ardlie Street intersection will be completed to determine what impact the proposed Masterplan will have on Botanic Road and Hopetoun Road adjacent to the site.

6.1 Botanic Road/ Botanic Road Western Access Point

As detailed in Section 2.4.2.6, it is estimated that during the 30 minute PM Peak period, 30 car parking spaces within the existing Emmanuel Centre South car park and the Year 7 & 8 Buildings South Car Park were occupied by visitors.

Therefore, due to the redevelopment of the existing staff/ visitor car park into a 54 car space drop off/ pick up zone, and the relocation of all visitor trips to this car park, it is expected that the existing movements into and out of the site at the Botanic Road/ Botanic Road Western Access Point will increase by a factor of 1.8 (54 new car parking spaces divide by 30 existing occupied car parking spaces). Therefore, for analysis purposes the existing turning movement volumes at the existing access point will be factored up by 1.8[6].

Refer Figure 6.1 for the expected intersection turning movement volumes at the Botanic Road Western Access Point.

[6] The AM peak turn movement volumes have been increased by the same factor as a worst-case scenario.

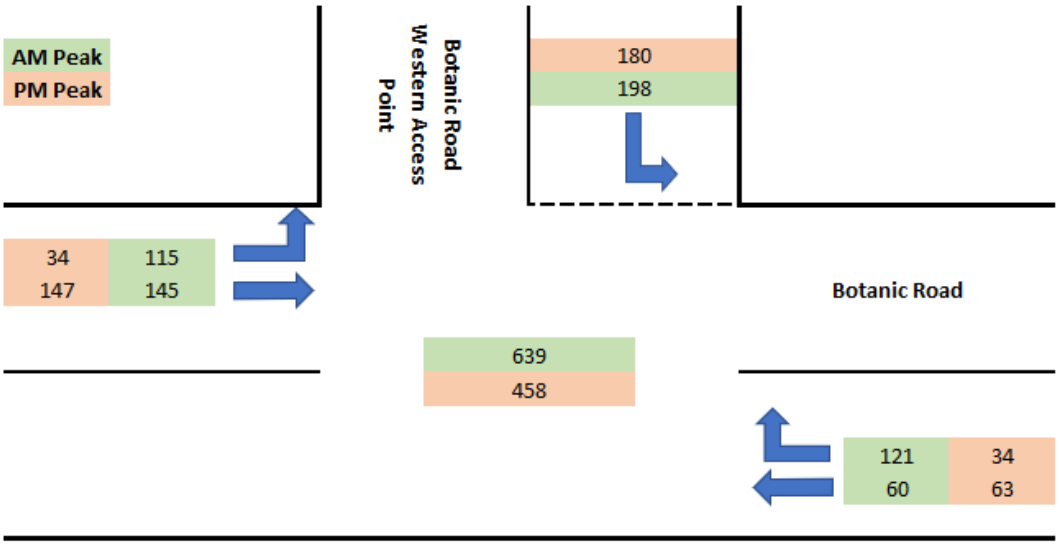


Figure 6.1: Botanic Road/ Botanic Rd Western Access Point Intersection Future Intersection Turning Movement Volumes[7]

A summary of the Degree of Saturation, Average Delay, Level of Service, and 95% Back of Queue Distance results of the analysis for the "total approach" of the intersection with the existing traffic volumes are provided in Table 6.1. Full results are provided in Appendix F.

Table 6.1: SIDRA Summary Results – Existing Botanic Road/ Botanic Rd Western Access Point Intersection with Future Volumes

Approach Leg	Botanic Road (East)	Botanic Road Western AP (North)	Botanic Road (West)
AM Peak			
Degree of Saturation	0.298	0.321	0.281
Average Delay (sec)	5.1	4.8	1.5
Level of Service	-	A	-
95% Queue Distance (m)	12.5	10.8	0
PM Peak			
Degree of Saturation	0.119	0.289	0.189
Average Delay (sec)	2.2	4.7	0.6
Level of Service	-	A	-
95% Queue Distance (m)	3.5	9.4	0

As detailed in Table 6.1, the Botanic Rd Western Access Point approach has a Level of Service A, Degree of Saturation below 0.33, Average Delay less than 5 seconds, and Queues less than 11 metres long during both the AM Peak and PM Peak periods.

The Botanic Road approaches have a Degree of Saturation below 0.3, Average Delay less than 6 seconds, and Queues less than 13 metres long during both the AM and PM Peak periods.

These results indicate that the existing intersection permitting left-in/ left-out/ right-in only movements is expected to continue operating well below its expected capacity at full development.

[7] As the college is located within an established area, the existing through traffic volumes have not been grown. Any growth has been accounted for with the increase in student numbers.

6.2 Hopetoun Road Access Point

The Hopetoun Road access point is expected to generate approximately 50 student trips into the site during the AM peak period and 50 student trips out the site during the PM peak period and 22 staff trips into and out of the site during the 30 minute AM & PM peak period[8]. Therefore during the 30 minute AM and PM peak period, a total of 72 vehicles will enter and exit the site respectively.

Refer Figure 6.2 for the expected intersection turning movement volumes at the Hopetoun Road Access Point. It is estimated that approximately 30% of vehicles will enter/ exit the site from/ to the north and 70% of vehicles will enter/ exit the site from/ to the south.

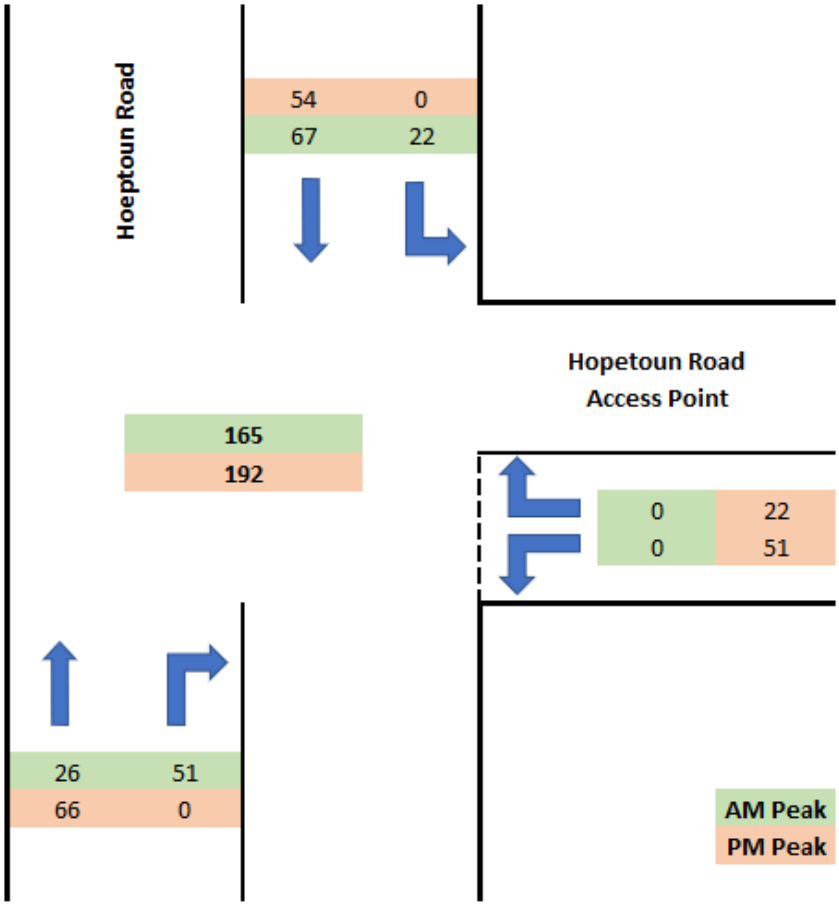


Figure 6.2: Hopetoun Road/ Hopetoun Road Access Point Intersection Future Intersection Turning Movement Volumes[7]

A summary of the Degree of Saturation, Average Delay, Level of Service, and 95% Back of Queue Distance results of the analysis for the "total approach" of the intersection with the existing traffic volumes are provided in Table 6.2. Full results are provided in Appendix F.

[8] Based on the car parking occupancy survey, it is estimated that 30% of staff enter and exit the site during the AM & PM peak periods respectively.

Table 6.2: SIDRA Summary Results – Hopetoun Rd/ Hopetoun Rd Access Point Intersection with Future Volumes

Approach Leg	Hopetoun Road (South)	Hopetoun Road Access Point (East)	Hopetoun Road (North)
AM Peak			
Degree of Saturation	0.092	0.003	0.090
Average Delay (sec)	2.9	4.2	0.9
Level of Service	-	A	-
95% Queue Distance (m)	3.2	0.1	0
PM Peak			
Degree of Saturation	0.065	0.111	0.056
Average Delay (sec)	0.1	4.0	0.1
Level of Service	-	A	-
95% Queue Distance (m)	0.1	3.0	0

As detailed in Table 6.2, the Hopetoun Road Access Point approach has a Level of Service A, Degree of Saturation below 0.12, Average Delay less than 5 seconds, and Queues less than 3 metres long during both the AM Peak and PM Peak periods.

The Hopetoun Road approaches have a Degree of Saturation below 0.1, Average Delay less than 3 seconds, and Queues less than 4 metres long during both the AM and PM Peak periods.

These results indicate that the future Hopetoun Road/ Hopetoun Road Access Point intersection is expected to operate well below its expected capacity at full development.

6.3 Botanic Road/ Ardlie Street intersection

Based on the results of the Botanic Road/ Botanic Road Western Access Point intersection assessment and considering that the existing Botanic Road/ Ardlie Street roundabout is currently operating well below its expected capacity with a level of service A, refer Section 2.3.2.2, it is expected that the relocation of all college visitor trips to the proposed visitor pick up/ drop off zone and the increase in trips due to the increased enrolments (300 students) will not have a detrimental impact on the operational performance of the existing roundabout. Therefore, an assessment of the Botanic Road/ Ardlie Street roundabout is not required.

7 RECOMMENDATIONS & CONCLUSION

Based on the findings of this traffic impact assessment report, the following recommendations are made:

- Speed Limits:
    - Extend the 40km/h school zone speed limit on Botanic Road up to Raglan Parade/ Princes Highway.
    - Reduce the speed limit on Ardlie Street to 50km/h from 60km/h outside of school hours and extend the 40km/h speed limit during school hours on Ardlie Street to the north along the college boundary.
    - A 40km/h speed limit during school times be implemented on Hopetoun Road along the college boundary.

  It is noted that the change in speed limit is the responsibility of the road authority.
- Waste collection services occur any time prior to 8:00am, or after 4:00pm weekdays, or anytime on weekends and non-school days.
- Maintenance/ delivery vehicle access to the site is restricted to prior to 8:00am, between 9am and 3pm, or any time after 4:00pm school days, or anytime on weekends and non-school days.
- A footpath should be provided on the east side of Hopetoun Road along the school frontage and connect into the existing footpath network to the north and south.
- To prevent parents, visitors, and local traffic from using the internal east-west aligned accessway, the following signage is to be installed:
    - Hopetoun Road Access Point - “Staff, Student, Bus & Maintenance Vehicle Access Only” signage.
    - East-west accessway:
        - West of the bus parking bays - “School Maintenance Vehicle Access Only” signage facing west.
        - East of the raised crossing - “Bus & School Maintenance Vehicle Access Only” signage facing east towards the turning area.
        - South of the Turnaround area – “No Left Turn, Buses & School Maintenance Vehicle Excepted” signage facing approaching traffic.
- “Staff & Student Parking Only” signage be provided at the western car park access point and “Staff Parking Only” signage be provided at the eastern car park, southern car park, Year 9 Centre car park access points.
- “Drop-off/ pick-up zone” adjacent to the Emmanuel Centre car parks.
- “No stopping” signage be provided around the drop-off/ pick-up zone turning area.
- “Zebra” crossing signage be provided at the raised crossing west of the turnaround area.
- All landscaped areas located adjacent to the pedestrian crossing points and the circulation road intersections have vegetation that is less than 900mm in height so as not to obstruct driver and pedestrian sightlines.
- The Hopetoun Road access point be provided with a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road.
- Botanic Road/ Western Access Point Intersection:
    - The addition of extra line marking and a left turn pavement arrow adjacent to the median island to re-enforce the left turn only movement.

- The addition of a “No Right Turn at Botanic Road” signage (R2-V126(R)) installed within the site on the approach to Botanic Road.
- Provide a break in the double solid lines on Botanic Road adjacent to the entry lane to allow for vehicles to turn right into the access point.

Based on the key findings and recommendations of this TIAR, it can be concluded that the proposed expansion of the college is generally in accordance with the requirements of the Warrnambool Planning Scheme and Australian Standards. Further, the expansion of the college as per the Proposed Masterplan provided in Appendix D will not have a detrimental impact on the existing road network adjacent to the site.

Therefore, provided that the recommendations as detailed in this TIAR are made conditions of the planning permit and implemented into the Proposed Masterplan, then there are no traffic engineering reasons as to why the responsible authority should not grant a planning permit to expand the college and incorporate the proposed Master Plan changes.

APPENDIX A – TRAFFIC VOLUME SURVEY RESULTS

Automatic Traffic Count Summary Sheet

[for tube counters]

Street Name :	Hopetoun Rd	Location :	Btw Princes Hwy and McPherson Cres
Suburb/Locality :	Warrnambool	Start Date :	Sunday 20 February 22
		Finsh Date :	Saturday 26 February 22
Site ID Number :	6237_01	Speed Zone :	50
Prepared By :	Counters Plus	Road Classification :	
Date :	Mon 07 Mar 22		
File Name :	C:\Users\Tony Dinh\Box Sync\Projects\22001_Emmanual College\Key Data\Traffic Surveys\TTS Hopetoun Rd Btwn Princes Hwy and Mcpherson Cres Results.xlsm		

			Direction of Travel		
			Two-Way	Northbound	Southbound
Traffic Volume :		Week Days Only	2,591	1,401	1,191
[Vehicles/Day]		7 Day Average	2,425	1,315	1,110
Peak Hour	**AM**	8:00	184	52	133
Volume:	**PM**	17:00	242	152	90
Speeds :		85th Percentile	61	60	62
[Km/Hr]		Average	53.3	52.5	54.2
Classification % :		Class 1*	94.4%	93.1%	95.8%

Notes : (Observations)

* Class 1 - Short Vehicles up to 5.5m

Automatic Traffic Counts - Site Data

Site No:	6237_01
Date:	Sunday 20 February 22
Start Time:	00:00
Prepared by:	Counters Plus
Road:	Hopetoun Rd
Suburb/Locality:	Warrnambool
Location : Btw Princes Hwy and McPherson Cres	
Counter No:	
Map Ref:	TBA
Comments:	

North Point

Survey No.	6237	7 Day Total	9207
Road	Hopetoun Rd	% Heavies	5.27%
Site No.	6237_01	Weekday Total	7003
Direction	Northbound	% Heavies	5.58%
Location	Btw Princes Hwy and McPherson Cres	Weekend Total	2204
		% Heavies	4.26%
Period	Sun 20 Feb - Sat 26 Feb 22		

Day Date	Mon 21/02/2022	Tue 22/02/2022	Wed 23/02/2022	Thu 24/02/2022	Fri 25/02/2022	Sat 26/02/2022	Sun 20/02/2022	7 Day Average	Weekday Average	Weekend Average
AM Peak	10:00-90	10:00-91	10:00-92	10:00-88	11:00-109	11:00-112	10:00-84	11:00-92.6	11:00-90.4	11:00-98
PM Peak	17:00-140	17:00-179	17:00-160	15:00-150	17:00-134	13:00-105	14:00-90	17:00-130.7	17:00-152	15:00-91
00:00	4	3	3	7	5	17	28	10	4	23
01:00	0	4	0	2	5	10	6	4	2	8
02:00	0	2	0	2	2	6	6	3	1	6
03:00	1	2	4	2	0	5	9	3	2	7
04:00	3	2	3	1	3	5	0	2	2	3
05:00	4	6	2	4	6	2	3	4	4	3
06:00	33	35	40	34	32	18	17	30	35	18
07:00	34	42	36	28	35	23	15	30	35	19
08:00	52	48	52	57	49	18	19	42	52	19
09:00	49	69	79	59	69	52	37	59	65	45
10:00	90	91	92	88	78	100	84	89	88	92
11:00	88	80	88	87	109	112	84	93	90	98
12:00	105	110	99	113	102	94	79	100	106	87
13:00	104	101	107	100	95	105	63	96	101	84
14:00	85	109	110	91	113	84	90	97	102	87
15:00	125	122	137	150	119	94	88	119	131	91
16:00	129	155	137	136	124	81	85	121	136	83
17:00	140	179	160	147	134	73	82	131	152	78
18:00	85	71	102	84	96	87	61	84	88	74
19:00	59	46	67	80	83	54	51	63	67	53
20:00	47	52	52	52	73	51	37	52	55	44
21:00	24	32	58	32	49	42	32	38	39	37
22:00	31	23	26	28	37	36	20	29	29	28
23:00	13	17	10	13	18	29	10	16	14	20
Total	1305	1401	1464	1397	1436	1198	1006	1315	1401	1102
% Heavy	6.5%	5.0%	6.1%	5.0%	5.3%	4.8%	3.6%	5.3%	5.6%	4.3%

Survey No.	6237	7 Day Total	7769
Road	Hopetoun Rd	% Heavies	2.77%
Site No.	6237_01	Weekday Total	5954
Direction	Southbound	% Heavies	3.09%
Location	Btw Princes Hwy and McPherson Cres	Weekend Total	1815
		% Heavies	1.71%
Period	Sun 20 Feb - Sat 26 Feb 22		

Day Date	Mon 21/02/2022	Tue 22/02/2022	Wed 23/02/2022	Thu 24/02/2022	Fri 25/02/2022	Sat 26/02/2022	Sun 20/02/2022	7 Day Average	Weekday Average	Weekend Average
AM Peak	08:00-126	08:00-126	08:00-141	08:00-146	08:00-125	10:00-88	11:00-83	08:00-110	08:00-132.8	11:00-83.5
PM Peak	15:00-107	17:00-105	15:00-109	15:00-111	15:00-114	12:00-83	13:00-79	15:00-96.3	15:00-108	13:00-77
00:00	0	0	2	0	1	8	8	3	1	8
01:00	0	3	0	0	2	1	4	1	1	3
02:00	1	4	3	2	2	5	4	3	2	5
03:00	1	1	3	2	0	8	6	3	1	7
04:00	6	7	3	4	6	6	4	5	5	5
05:00	21	24	24	22	21	7	4	18	22	6
06:00	25	29	30	34	39	18	16	27	31	17
07:00	63	60	69	73	65	31	18	54	66	25
08:00	126	126	141	146	125	66	40	110	133	53
09:00	60	75	83	72	67	65	57	68	71	61
10:00	82	81	68	76	85	88	64	78	78	76
11:00	79	76	75	78	67	84	83	77	75	84
12:00	76	72	82	82	73	83	64	76	77	74
13:00	80	87	82	69	77	75	79	78	79	77
14:00	77	82	92	86	76	57	63	76	83	60
15:00	107	99	109	111	114	63	71	96	108	67
16:00	72	82	83	82	80	58	70	75	80	64
17:00	78	105	93	90	86	52	58	80	90	55
18:00	57	51	59	68	64	48	38	55	60	43
19:00	37	32	56	39	59	53	31	44	45	42
20:00	29	28	38	32	49	28	34	34	35	31
21:00	19	21	21	20	29	25	18	22	22	22
22:00	17	11	16	9	18	16	12	14	14	14
23:00	10	9	10	7	15	18	6	11	10	12
Total	1123	1165	1242	1204	1220	963	852	1110	1191	908
% Heavy	3.7%	2.9%	3.4%	2.4%	3.1%	2.0%	1.4%	2.8%	3.1%	1.7%

Survey No.	6237	7 Day Total	16976
Road	Hopetoun Rd	% Heavies	4.12%
Site No.	6237_01	Weekday Total	12957
Direction	Combined N-S	% Heavies	4.44%
Location	Btw Princes Hwy and McPherson Cres	Weekend Total	4019
		% Heavies	3.11%
Period	Sun 20 Feb - Sat 26 Feb 22		

Day Date	Mon 21/02/2022	Tue 22/02/2022	Wed 23/02/2022	Thu 24/02/2022	Fri 25/02/2022	Sat 26/02/2022	Sun 20/02/2022	7 Day Average	Weekday Average	Weekend Average
AM Peak	08:00-178	08:00-174	08:00-193	08:00-203	11:00-176	11:00-196	11:00-167	11:00-170	08:00-184.4	11:00-181.5
PM Peak	15:00-232	17:00-284	17:00-253	15:00-261	15:00-233	13:00-180	15:00-159	15:00-215.6	17:00-242.4	13:00-161
00:00	4	3	5	7	6	25	36	12	5	31
01:00	0	7	0	2	7	11	10	5	3	11
02:00	1	6	3	4	4	11	10	6	4	11
03:00	2	3	7	4	0	13	15	6	3	14
04:00	9	9	6	5	9	11	4	8	8	8
05:00	25	30	26	26	27	9	7	21	27	8
06:00	58	64	70	68	71	36	33	57	66	35
07:00	97	102	105	101	100	54	33	85	101	44
08:00	178	174	193	203	174	84	59	152	184	72
09:00	109	144	162	131	136	117	94	128	136	106
10:00	172	172	160	164	163	188	148	167	166	168
11:00	167	156	163	165	176	196	167	170	165	182
12:00	181	182	181	195	175	177	143	176	183	160
13:00	184	188	189	169	172	180	142	175	180	161
14:00	162	191	202	177	189	141	153	174	184	147
15:00	232	221	246	261	233	157	159	216	239	158
16:00	201	237	220	218	204	139	155	196	216	147
17:00	218	284	253	237	220	125	140	211	242	133
18:00	142	122	161	152	160	135	99	139	147	117
19:00	96	78	123	119	142	107	82	107	112	95
20:00	76	80	90	84	122	79	71	86	90	75
21:00	43	53	79	52	78	67	50	60	61	59
22:00	48	34	42	37	55	52	32	43	43	42
23:00	23	26	20	20	33	47	16	26	24	32
Total	2428	2566	2706	2601	2656	2161	1858	2425	2591	2010
% Heavy	5.2%	4.1%	4.9%	3.8%	4.3%	3.6%	2.6%	4.1%	4.4%	3.1%

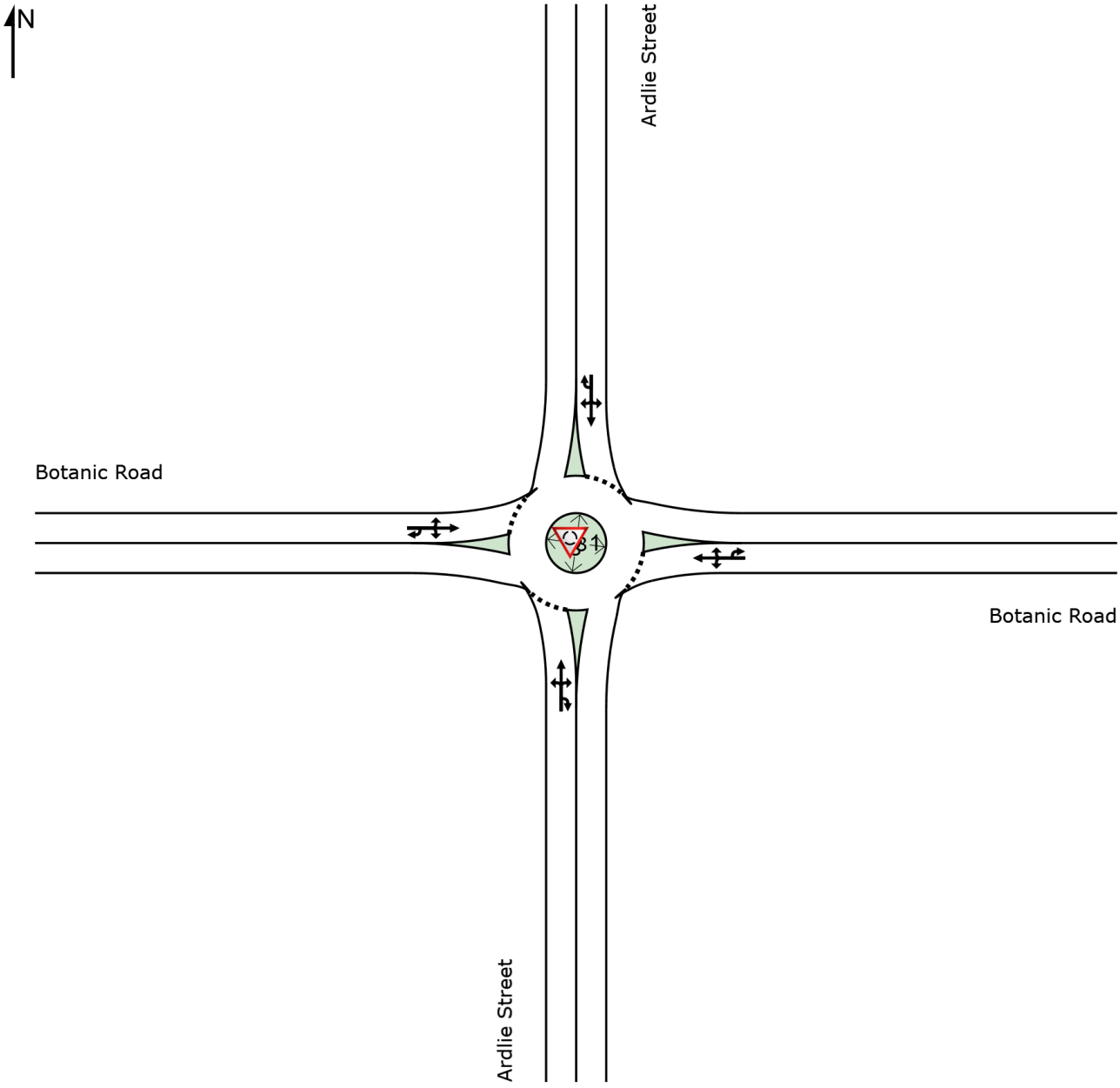
APPENDIX B – EXISTING SIDRA ANALYSIS RESULTS

SITE LAYOUT

Site: 1 [Botanic Road/ Ardlie Street Roundabout - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Roundabout

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



LANE SUMMARY

Site: 1 [Botanic Road/ Ardlie Street Roundabout - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Ardlie Street													
Lane 1[d]	124	0.0	870	0.143	100	5.7	LOS A	0.8	5.7	Full	500	0.0	0.0
Approach	124	0.0		0.143		5.7	LOS A	0.8	5.7				
East: Botanic Road													
Lane 1[d]	462	2.6	1049	0.441	100	5.3	LOS A	3.1	22.5	Full	500	0.0	0.0
Approach	462	2.6		0.441		5.3	LOS A	3.1	22.5				
North: Ardlie Street													
Lane 1[d]	278	3.5	741	0.375	100	7.1	LOS A	2.5	18.1	Full	500	0.0	0.0
Approach	278	3.5		0.375		7.1	LOS A	2.5	18.1				
West: Botanic Road													
Lane 1[d]	578	8.0	1047	0.552	100	5.2	LOS A	4.4	32.9	Full	500	0.0	0.0
Approach	578	8.0		0.552		5.2	LOS A	4.4	32.9				
Intersection	1442	4.7		0.552		5.6	LOS A	4.4	32.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
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.

d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 1 [Botanic Road/ Ardlie Street Roundabout - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	HV] %	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: Ardlie Street														
1	L2	19	0.0	38	0.0	0.143	5.2	LOS A	0.8	5.7	0.59	0.63	0.59	37.5
2	T1	28	0.0	56	0.0	0.143	4.9	LOS A	0.8	5.7	0.59	0.63	0.59	38.1
3	R2	14	0.0	28	0.0	0.143	7.9	LOS A	0.8	5.7	0.59	0.63	0.59	38.0
3u	U	1	0.0	2	0.0	0.143	9.2	LOS A	0.8	5.7	0.59	0.63	0.59	38.4
Approach		62	0.0	124	0.0	0.143	5.7	LOS A	0.8	5.7	0.59	0.63	0.59	37.9
East: Botanic Road														
4	L2	33	3.0	66	3.0	0.441	4.6	LOS A	3.1	22.5	0.57	0.61	0.57	37.6
5	T1	125	1.0	250	1.0	0.441	4.2	LOS A	3.1	22.5	0.57	0.61	0.57	38.1
6	R2	63	6.0	126	6.0	0.441	7.4	LOS A	3.1	22.5	0.57	0.61	0.57	38.1
6u	U	10	0.0	20	0.0	0.441	8.5	LOS A	3.1	22.5	0.57	0.61	0.57	38.5
Approach		231	2.6	462	2.6	0.441	5.3	LOS A	3.1	22.5	0.57	0.61	0.57	38.0
North: Ardlie Street														
7	L2	69	7.0	138	7.0	0.375	7.1	LOS A	2.5	18.1	0.77	0.79	0.77	37.1
8	T1	58	0.0	116	0.0	0.375	6.5	LOS A	2.5	18.1	0.77	0.79	0.77	37.6
9	R2	11	0.0	22	0.0	0.375	9.5	LOS A	2.5	18.1	0.77	0.79	0.77	37.6
9u	U	1	0.0	2	0.0	0.375	10.8	LOS B	2.5	18.1	0.77	0.79	0.77	38.0
Approach		139	3.5	278	3.5	0.375	7.1	LOS A	2.5	18.1	0.77	0.79	0.77	37.3
West: Botanic Road														
10	L2	37	14.0	74	14.0	0.552	5.1	LOS A	4.4	32.9	0.63	0.61	0.63	37.5
11	T1	200	9.0	400	9.0	0.552	4.6	LOS A	4.4	32.9	0.63	0.61	0.63	38.1
12	R2	48	0.0	96	0.0	0.552	7.4	LOS A	4.4	32.9	0.63	0.61	0.63	38.1
12u	U	4	0.0	8	0.0	0.552	8.7	LOS A	4.4	32.9	0.63	0.61	0.63	38.5
Approach		289	8.0	578	8.0	0.552	5.2	LOS A	4.4	32.9	0.63	0.61	0.63	38.0
All Vehicles		721	4.7	1442	4.7	0.552	5.6	LOS A	4.4	32.9	0.64	0.65	0.64	37.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
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.

LANE SUMMARY

Site: 1 [Botanic Road/ Ardlie Street Roundabout - Existing PM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Ardlie Street													
Lane 1[d]	106	0.0	967	0.110	100	5.7	LOS A	0.6	4.1	Full	500	0.0	0.0
Approach	106	0.0		0.110		5.7	LOS A	0.6	4.1				
East: Botanic Road													
Lane 1[d]	372	3.0	1146	0.325	100	4.8	LOS A	2.1	15.2	Full	500	0.0	0.0
Approach	372	3.0		0.325		4.8	LOS A	2.1	15.2				
North: Ardlie Street													
Lane 1[d]	192	4.4	790	0.243	100	6.4	LOS A	1.5	10.7	Full	500	0.0	0.0
Approach	192	4.4		0.243		6.4	LOS A	1.5	10.7				
West: Botanic Road													
Lane 1[d]	514	3.8	1067	0.482	100	4.7	LOS A	3.5	25.2	Full	500	0.0	0.0
Approach	514	3.8		0.482		4.7	LOS A	3.5	25.2				
Intersection	1184	3.3		0.482		5.1	LOS A	3.5	25.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
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.

d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 1 [Botanic Road/ Ardlie Street Roundabout - Existing PM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	HV] %	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: Ardlie Street														
1	L2	7	0.0	14	0.0	0.110	4.5	LOS A	0.6	4.1	0.50	0.59	0.50	37.5
2	T1	21	0.0	42	0.0	0.110	4.2	LOS A	0.6	4.1	0.50	0.59	0.50	38.1
3	R2	22	0.0	44	0.0	0.110	7.2	LOS A	0.6	4.1	0.50	0.59	0.50	38.0
3u	U	3	0.0	6	0.0	0.110	8.5	LOS A	0.6	4.1	0.50	0.59	0.50	38.4
Approach		53	0.0	106	0.0	0.110	5.7	LOS A	0.6	4.1	0.50	0.59	0.50	38.0
East: Botanic Road														
4	L2	36	3.0	72	3.0	0.325	3.8	LOS A	2.1	15.2	0.43	0.53	0.43	37.8
5	T1	79	1.0	158	1.0	0.325	3.4	LOS A	2.1	15.2	0.43	0.53	0.43	38.3
6	R2	62	6.0	124	6.0	0.325	6.6	LOS A	2.1	15.2	0.43	0.53	0.43	38.3
6u	U	9	0.0	18	0.0	0.325	7.7	LOS A	2.1	15.2	0.43	0.53	0.43	38.7
Approach		186	3.0	372	3.0	0.325	4.8	LOS A	2.1	15.2	0.43	0.53	0.43	38.2
North: Ardlie Street														
7	L2	47	9.0	94	9.0	0.243	6.4	LOS A	1.5	10.7	0.67	0.71	0.67	37.3
8	T1	38	0.0	76	0.0	0.243	5.7	LOS A	1.5	10.7	0.67	0.71	0.67	37.9
9	R2	9	0.0	18	0.0	0.243	8.7	LOS A	1.5	10.7	0.67	0.71	0.67	37.9
9u	U	2	0.0	4	0.0	0.243	10.0	LOS B	1.5	10.7	0.67	0.71	0.67	38.3
Approach		96	4.4	192	4.4	0.243	6.4	LOS A	1.5	10.7	0.67	0.71	0.67	37.6
West: Botanic Road														
10	L2	36	11.0	72	11.0	0.482	4.9	LOS A	3.5	25.2	0.58	0.58	0.58	37.7
11	T1	192	3.0	384	3.0	0.482	4.3	LOS A	3.5	25.2	0.58	0.58	0.58	38.3
12	R2	28	0.0	56	0.0	0.482	7.3	LOS A	3.5	25.2	0.58	0.58	0.58	38.2
12u	U	1	0.0	2	0.0	0.482	8.6	LOS A	3.5	25.2	0.58	0.58	0.58	38.6
Approach		257	3.8	514	3.8	0.482	4.7	LOS A	3.5	25.2	0.58	0.58	0.58	38.2
All Vehicles		592	3.3	1184	3.3	0.482	5.1	LOS A	3.5	25.2	0.54	0.59	0.54	38.1

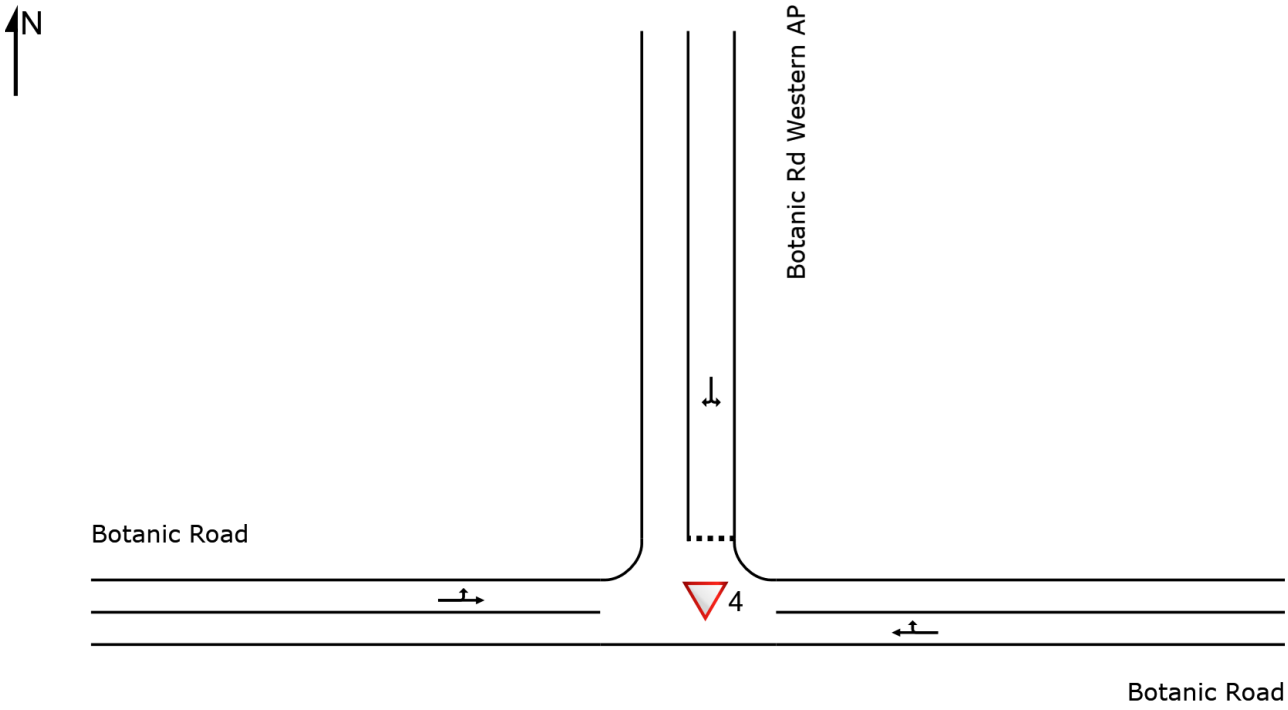
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
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.

SITE LAYOUT

Site: 4 [Botanic Rd/ Botanic Rd Western Access Point - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

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



LANE SUMMARY

Site: 4 [Botanic Rd/ Botanic Rd Western Access Point - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Botanic Road													
Lane 1	254	1.4	1432	0.177	100	3.5	LOS A	0.9	6.5	Full	240	0.0	0.0
Approach	254	1.4		0.177		3.5	NA	0.9	6.5				
North: Botanic Rd Western AP													
Lane 1	220	0.9	1184	0.186	100	4.7	LOS A	0.8	5.5	Full	100	0.0	0.0
Approach	220	0.9		0.186		4.7	LOS A	0.8	5.5				
West: Botanic Road													
Lane 1	418	7.6	1850	0.226	100	1.1	LOS A	0.0	0.0	Full	60	0.0	0.0
Approach	418	7.6		0.226		1.1	NA	0.0	0.0				
Intersection	892	4.2		0.226		2.7	NA	0.9	6.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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: 4 [Botanic Rd/ Botanic Rd Western Access Point - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	INPUT VOLUMES HV] %	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Botanic Road														
5	T1	60	3.0	120	3.0	0.177	1.5	LOS A	0.9	6.5	0.47	0.33	0.47	35.4
6	R2	67	0.0	134	0.0	0.177	5.3	LOS A	0.9	6.5	0.47	0.33	0.47	35.9
Approach		127	1.4	254	1.4	0.177	3.5	NA	0.9	6.5	0.47	0.33	0.47	35.6
North: Botanic Rd Western AP														
7	L2	104	1.0	208	1.0	0.186	4.6	LOS A	0.8	5.5	0.40	0.57	0.40	34.9
9	R2	6	0.0	12	0.0	0.186	6.9	LOS A	0.8	5.5	0.40	0.57	0.40	30.4
Approach		110	0.9	220	0.9	0.186	4.7	LOS A	0.8	5.5	0.40	0.57	0.40	34.7
West: Botanic Road														
10	L2	64	2.0	128	2.0	0.226	3.4	LOS A	0.0	0.0	0.00	0.14	0.00	38.1
11	T1	145	10.0	290	10.0	0.226	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	38.4
Approach		209	7.6	418	7.6	0.226	1.1	NA	0.0	0.0	0.00	0.14	0.00	38.4
All Vehicles		446	4.2	892	4.2	0.226	2.7	NA	0.9	6.5	0.23	0.30	0.23	36.4

Site Level of Service (LOS) Method: Delay (SIDRA). 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.

LANE SUMMARY

Site: 4 [Botanic Rd/ Botanic Rd Western Access Point - Existing PM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Botanic Road													
Lane 1	164	0.0	1749	0.094	100	1.4	LOS A	0.3	2.1	Full	240	0.0	0.0
Approach	164	0.0		0.094		1.4	NA	0.3	2.1				
North: Botanic Rd Western AP													
Lane 1	200	0.0	1173	0.171	100	4.7	LOS A	0.7	4.9	Full	100	0.0	0.0
Approach	200	0.0		0.171		4.7	LOS A	0.7	4.9				
West: Botanic Road													
Lane 1	332	3.5	1915	0.173	100	0.4	LOS A	0.0	0.0	Full	60	0.0	0.0
Approach	332	3.5		0.173		0.4	NA	0.0	0.0				
Intersection	696	1.7		0.173		1.9	NA	0.7	4.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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: 4 [Botanic Rd/ Botanic Rd Western Access Point - Existing PM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	INPUT VOLUMES HV] %	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Botanic Road														
5	T1	63	0.0	126	0.0	0.094	0.5	LOS A	0.3	2.1	0.22	0.12	0.22	37.7
6	R2	19	0.0	38	0.0	0.094	4.7	LOS A	0.3	2.1	0.22	0.12	0.22	38.0
Approach		82	0.0	164	0.0	0.094	1.4	NA	0.3	2.1	0.22	0.12	0.22	37.8
North: Botanic Rd Western AP														
7	L2	88	0.0	176	0.0	0.171	4.5	LOS A	0.7	4.9	0.39	0.57	0.39	34.9
9	R2	12	0.0	24	0.0	0.171	5.8	LOS A	0.7	4.9	0.39	0.57	0.39	30.4
Approach		100	0.0	200	0.0	0.171	4.7	LOS A	0.7	4.9	0.39	0.57	0.39	34.6
West: Botanic Road														
10	L2	19	0.0	38	0.0	0.173	3.4	LOS A	0.0	0.0	0.00	0.05	0.00	39.8
11	T1	147	4.0	294	4.0	0.173	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.4
Approach		166	3.5	332	3.5	0.173	0.4	NA	0.0	0.0	0.00	0.05	0.00	39.4
All Vehicles		348	1.7	696	1.7	0.173	1.9	NA	0.7	4.9	0.17	0.22	0.17	37.4

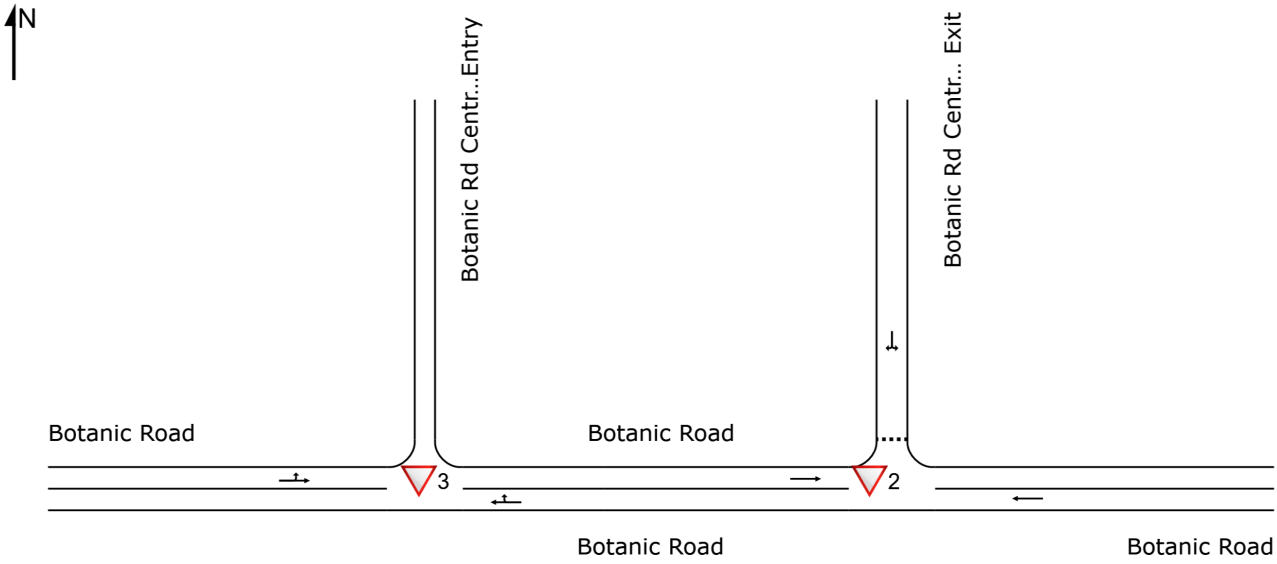
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and 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.

NETWORK LAYOUT

Network: N101 [Botanic Rd/ Botanic Rd Central Access Point - Existing AM Peak (Network Folder: General)]

New Network
Network Category: (None)

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



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽2	NA	Botanic Rd/ Botanic Rd Central Exit Point - Existing AM Peak
▽3	NA	Botanic Rd/ Botanic Rd Central Entry Point - Existing AM Peak

LANE SUMMARY

Site: 2 [Botanic Rd/ Botanic Rd Central Exit Point - Existing AM Peak (Site Folder: Emmanuel College)]

Network: N101 [Botanic Rd/ Botanic Rd Central Access Point - Existing AM Peak (Network Folder: General)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Botanic Road															
Lane 1	318	3.0	318	3.0	1933	0.165	100	0.0	LOS A	0.0	0.0	Full	30	0.0	0.0
Approach	318	3.0	318	3.0		0.165		0.0	NA	0.0	0.0				
North: Botanic Rd Central Exit															
Lane 1	98	0.0	98	0.0	1000	0.098	100	5.4	LOS A	0.4	2.6	Full	100	0.0	0.0
Approach	98	0.0	98	0.0		0.098		5.4	LOS A	0.4	2.6				
West: Botanic Road															
Lane 1	464	3.0	464	3.0	1933	0.240	100	0.0	LOS A	0.0	0.0	Full	75	0.0	0.0
Approach	464	3.0	464	3.0		0.240		0.0	NA	0.0	0.0				
Intersection	880	2.7	880	2.7		0.240		0.6	NA	0.4	2.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Botanic Rd/ Botanic Rd Central Exit Point - Existing AM Peak (Site Folder: Emmanuel College)]

Network: N101 [Botanic Rd/ Botanic Rd Central Access Point - Existing AM Peak (Network Folder: General)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL 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
East: Botanic Road														
5	T1	318	3.0	318	3.0	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		318	3.0	318	3.0	0.165	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
North: Botanic Rd Central Exit														
7	L2	94	0.0	94	0.0	0.098	5.3	LOS A	0.4	2.6	0.47	0.63	0.47	26.8
9	R2	4	0.0	4	0.0	0.098	8.4	LOS A	0.4	2.6	0.47	0.63	0.47	26.3
Approach		98	0.0	98	0.0	0.098	5.4	LOS A	0.4	2.6	0.47	0.63	0.47	26.8
West: Botanic Road														
11	T1	464	3.0	464	3.0	0.240	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
Approach		464	3.0	464	3.0	0.240	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
All Vehicles		880	2.7	880	2.7	0.240	0.6	NA	0.4	2.6	0.05	0.07	0.05	36.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 3 [Botanic Rd/ Botanic Rd Central Entry Point - Existing AM Peak (Site Folder: Emmanuel College)]

Network: N101 [Botanic Rd/ Botanic Rd Central Access Point - Existing AM Peak (Network Folder: General)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Botanic Road															
Lane 1	400	3.0	400	3.0	1648	0.243	100	2.0	LOS A	0.9	6.4	Full	75	0.0	0.0
Approach	400	3.0	400	3.0		0.243		2.0	NA	0.9	6.4				
West: Botanic Road															
Lane 1	498	3.2	498	3.2	1923	0.259	100	0.3	LOS A	0.0	0.0	Full	200	0.0	0.0
Approach	498	3.2	498	3.2		0.259		0.3	NA	0.0	0.0				
Intersection	898	3.1	898	3.1		0.259		1.0	NA	0.9	6.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [Botanic Rd/ Botanic Rd Central Entry Point - Existing AM Peak (Site Folder: Emmanuel College)]

Network: N101 [Botanic Rd/ Botanic Rd Central Access Point - Existing AM Peak (Network Folder: General)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL 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
East: Botanic Road														
5	T1	322	3.0	322	3.0	0.243	0.9	LOS A	0.9	6.4	0.28	0.12	0.28	37.1
6	R2	78	3.0	78	3.0	0.243	6.4	LOS A	0.9	6.4	0.28	0.12	0.28	34.5
Approach		400	3.0	400	3.0	0.243	2.0	NA	0.9	6.4	0.28	0.12	0.28	36.7
West: Botanic Road														
10	L2	34	6.0	34	6.0	0.259	3.5	LOS A	0.0	0.0	0.00	0.03	0.00	40.0
11	T1	464	3.0	464	3.0	0.259	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	39.4
Approach		498	3.2	498	3.2	0.259	0.3	NA	0.0	0.0	0.00	0.03	0.00	39.5
All Vehicles		898	3.1	898	3.1	0.259	1.0	NA	0.9	6.4	0.13	0.07	0.13	38.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 2 [Botanic Rd/ Botanic Rd Central Exit Point - Existing PM Peak (Site Folder: Emmanuel College)]

Network: N102 [Botanic Rd/ Botanic Rd Central Access Point - Existing PM Peak (Network Folder: General)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Botanic Road															
Lane 1	190	3.0	190	3.0	1933	0.098	100	0.0	LOS A	0.0	0.0	Full	30	0.0	0.0
Approach	190	3.0	190	3.0		0.098		0.0	NA	0.0	0.0				
North: Botanic Rd Central Exit															
Lane 1	60	0.0	60	0.0	1017	0.059	100	5.2	LOS A	0.2	1.5	Full	100	0.0	0.0
Approach	60	0.0	60	0.0		0.059		5.2	LOS A	0.2	1.5				
West: Botanic Road															
Lane 1	446	3.0	446	3.0	1933	0.231	100	0.0	LOS A	0.0	0.0	Full	75	0.0	0.0
Approach	446	3.0	446	3.0		0.231		0.0	NA	0.0	0.0				
Intersection	696	2.7	696	2.7		0.231		0.5	NA	0.2	1.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Botanic Rd/ Botanic Rd Central Exit Point - Existing PM Peak (Site Folder: Emmanuel College)]

Network: N102 [Botanic Rd/ Botanic Rd Central Access Point - Existing PM Peak (Network Folder: General)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL 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
East: Botanic Road														
5	T1	190	3.0	190	3.0	0.098	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		190	3.0	190	3.0	0.098	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
North: Botanic Rd Central Exit														
7	L2	56	0.0	56	0.0	0.059	5.1	LOS A	0.2	1.5	0.45	0.60	0.45	26.9
9	R2	4	0.0	4	0.0	0.059	7.0	LOS A	0.2	1.5	0.45	0.60	0.45	26.5
Approach		60	0.0	60	0.0	0.059	5.2	LOS A	0.2	1.5	0.45	0.60	0.45	26.9
West: Botanic Road														
11	T1	446	3.0	446	3.0	0.231	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
Approach		446	3.0	446	3.0	0.231	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
All Vehicles		696	2.7	696	2.7	0.231	0.5	NA	0.2	1.5	0.04	0.05	0.04	37.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 3 [Botanic Rd/ Botanic Rd Central Entry Point - Existing PM Peak (Site Folder: Emmanuel College)]

Network: N102 [Botanic Rd/ Botanic Rd Central Access Point - Existing PM Peak (Network Folder: General)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Botanic Road															
Lane 1	224	3.0	224	3.0	1741	0.129	100	1.2	LOS A	0.3	2.2	Full	75	0.0	0.0
Approach	224	3.0	224	3.0		0.129		1.2	NA	0.3	2.2				
West: Botanic Road															
Lane 1	470	3.2	470	3.2	1925	0.244	100	0.2	LOS A	0.0	0.0	Full	200	0.0	0.0
Approach	470	3.2	470	3.2		0.244		0.2	NA	0.0	0.0				
Intersection	694	3.1	694	3.1		0.244		0.5	NA	0.3	2.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [Botanic Rd/ Botanic Rd Central Entry Point - Existing PM Peak (Site Folder: Emmanuel College)]

Network: N102 [Botanic Rd/ Botanic Rd Central Access Point - Existing PM Peak (Network Folder: General)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL 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
East: Botanic Road														
5	T1	194	3.0	194	3.0	0.129	0.5	LOS A	0.3	2.2	0.18	0.08	0.18	38.2
6	R2	30	3.0	30	3.0	0.129	5.9	LOS A	0.3	2.2	0.18	0.08	0.18	35.9
Approach		224	3.0	224	3.0	0.129	1.2	NA	0.3	2.2	0.18	0.08	0.18	38.0
West: Botanic Road														
10	L2	24	6.0	24	6.0	0.244	3.5	LOS A	0.0	0.0	0.00	0.02	0.00	40.1
11	T1	446	3.0	446	3.0	0.244	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	39.6
Approach		470	3.2	470	3.2	0.244	0.2	NA	0.0	0.0	0.00	0.02	0.00	39.6
All Vehicles		694	3.1	694	3.1	0.244	0.5	NA	0.3	2.2	0.06	0.04	0.06	39.0

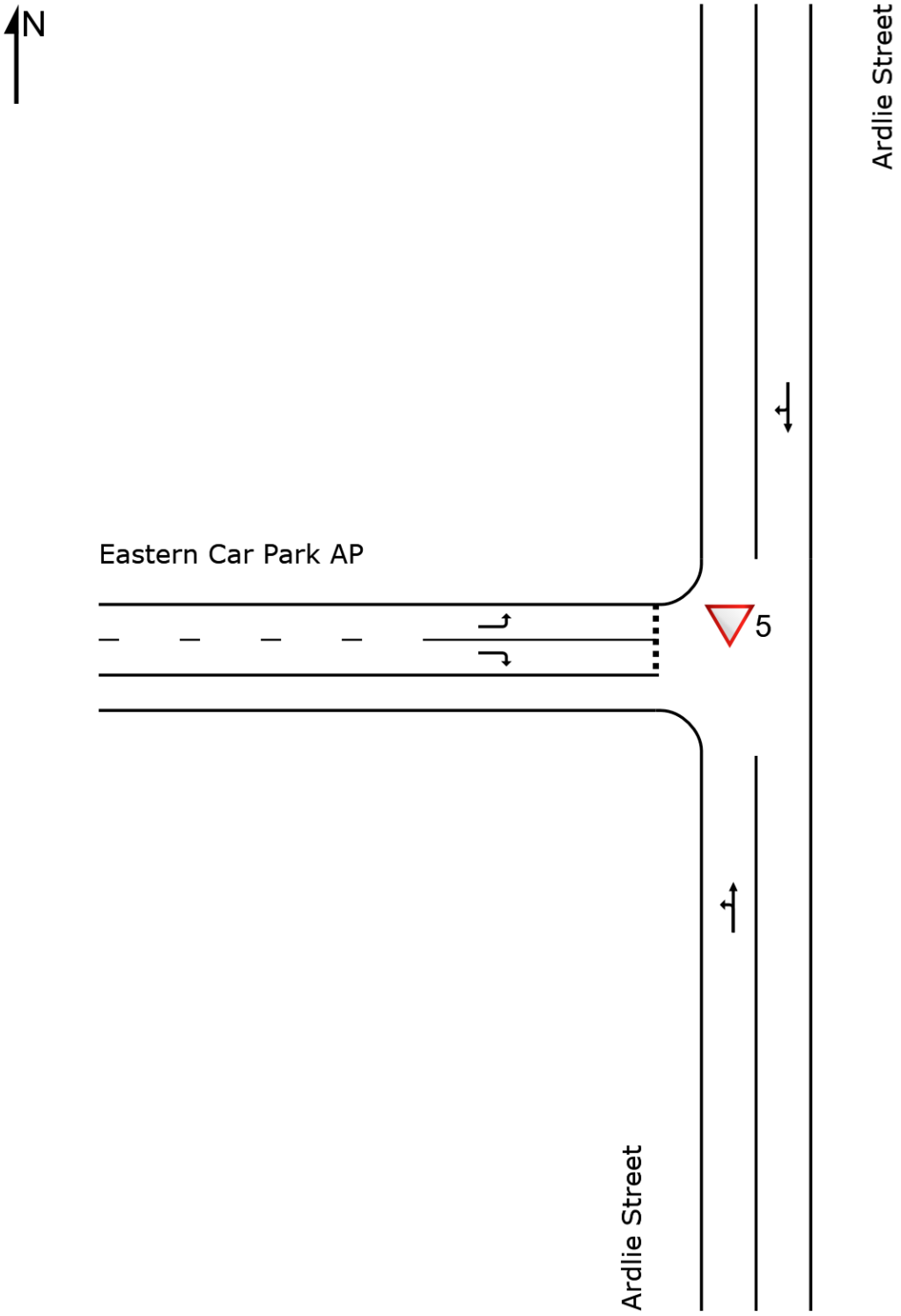
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [Ardlie Street/ Eastern CP Access Point - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

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



LANE SUMMARY

Site: 5 [Ardlie Street/ Eastern CP Access Point - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Ardlie Street													
Lane 1	256	6.4	1989	0.129	100	1.7	LOS A	0.0	0.0	Full	200	0.0	0.0
Approach	256	6.4		0.129		1.7	NA	0.0	0.0				
North: Ardlie Street													
Lane 1	198	1.9	1757	0.113	100	2.0	LOS A	0.5	3.5	Full	300	0.0	0.0
Approach	198	1.9		0.113		2.0	NA	0.5	3.5				
West: Eastern Car Park AP													
Lane 1	48	0.0	1461	0.033	100	3.8	LOS A	0.1	0.9	Full	50	0.0	0.0
Lane 2	140	0.0	898	0.156	100	5.2	LOS A	0.5	3.8	Full	50	0.0	0.0
Approach	188	0.0		0.156		4.8	LOS A	0.5	3.8				
Intersection	642	3.1		0.156		2.7	NA	0.5	3.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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: 5 [Ardlie Street/ Eastern CP Access Point - Existing AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	INPUT VOLUMES HV] %	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Ardlie Street														
10	L2	65	0.0	130	0.0	0.129	3.4	LOS A	0.0	0.0	0.00	0.23	0.00	38.0
11	T1	63	13.0	126	13.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	38.4
Approach		128	6.4	256	6.4	0.129	1.7	NA	0.0	0.0	0.00	0.23	0.00	38.2
North: Ardlie Street														
5	T1	62	3.0	124	3.0	0.113	0.6	LOS A	0.5	3.5	0.28	0.19	0.28	38.0
6	R2	37	0.0	74	0.0	0.113	4.3	LOS A	0.5	3.5	0.28	0.19	0.28	38.0
Approach		99	1.9	198	1.9	0.113	2.0	NA	0.5	3.5	0.28	0.19	0.28	38.0
West: Eastern Car Park AP														
7	L2	24	0.0	48	0.0	0.033	3.8	LOS A	0.1	0.9	0.22	0.45	0.22	35.7
9	R2	70	0.0	140	0.0	0.156	5.2	LOS A	0.5	3.8	0.41	0.62	0.41	33.0
Approach		94	0.0	188	0.0	0.156	4.8	LOS A	0.5	3.8	0.36	0.57	0.36	33.8
All Vehicles		321	3.1	642	3.1	0.156	2.7	NA	0.5	3.8	0.19	0.32	0.19	37.1

Site Level of Service (LOS) Method: Delay (SIDRA). 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.

LANE SUMMARY

Site: 5 [Ardlie Street/ Eastern CP Access Point - Existing PM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Ardlie Street													
Lane 1	238	6.4	2029	0.117	100	0.3	LOS A	0.0	0.0	Full	200	0.0	0.0
Approach	238	6.4		0.117		0.3	NA	0.0	0.0				
North: Ardlie Street													
Lane 1	124	6.4	1964	0.063	100	0.4	LOS A	0.1	0.6	Full	300	0.0	0.0
Approach	124	6.4		0.063		0.4	NA	0.1	0.6				
West: Eastern Car Park AP													
Lane 1	28	0.0	1342	0.021	100	4.1	LOS A	0.1	0.6	Full	50	0.0	0.0
Lane 2	80	0.0	926	0.086	100	4.9	LOS A	0.3	2.0	Full	50	0.0	0.0
Approach	108	0.0		0.086		4.7	LOS A	0.3	2.0				
Intersection	470	4.9		0.117		1.3	NA	0.3	2.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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: 5 [Ardlie Street/ Eastern CP Access Point - Existing PM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	HV] %	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: Ardlie Street														
10	L2	10	0.0	20	0.0	0.117	3.4	LOS A	0.0	0.0	0.00	0.04	0.00	40.0
11	T1	109	7.0	218	7.0	0.117	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	39.7
Approach		119	6.4	238	6.4	0.117	0.3	NA	0.0	0.0	0.00	0.04	0.00	39.7
North: Ardlie Street														
5	T1	57	7.0	114	7.0	0.063	0.1	LOS A	0.1	0.6	0.07	0.04	0.07	39.5
6	R2	5	0.0	10	0.0	0.063	4.2	LOS A	0.1	0.6	0.07	0.04	0.07	39.9
Approach		62	6.4	124	6.4	0.063	0.4	NA	0.1	0.6	0.07	0.04	0.07	39.5
West: Eastern Car Park AP														
7	L2	14	0.0	28	0.0	0.021	4.1	LOS A	0.1	0.6	0.30	0.47	0.30	35.4
9	R2	40	0.0	80	0.0	0.086	4.9	LOS A	0.3	2.0	0.38	0.58	0.38	33.3
Approach		54	0.0	108	0.0	0.086	4.7	LOS A	0.3	2.0	0.36	0.55	0.36	33.9
All Vehicles		235	4.9	470	4.9	0.117	1.3	NA	0.3	2.0	0.10	0.16	0.10	38.7

Site Level of Service (LOS) Method: Delay (SIDRA). 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.

APPENDIX C – BOTANIC ROAD WESTERN ACCESS POINT PERMITTED MOVEMENTS DOCUMENTS[9]

[9] The GTA Consultants traffic impact assessment report and the Feasibility Stage Road Safety Audit by Brian Consulting Pty Ltd can be provided at request.

Our Ref: OUTR13/2E80D59B

24 May 2013

WARRNAMBOOL
CITY COUNCIL

Mr Matt Cirillo,
c/- Mr Brendan Howard
Urbanomics
40 Kepler Street
WARRNAMBOOL 3280

Dear Matt and Brendan

Re: Emmanuel College Development Plan (amended)

I refer to the above and advise that Council has received and considered responses from external referral authorities, being VicRoads and Public Transport Victoria. Council's Infrastructure Services have also considered the proposal in conjunction with the response from the referral authorities.

In order for the proposed amended development plan to proceed to notification, it is suggested that the following information be provided:-

1. Full scaled plans, as per the plan submitted in February, 2013, titled "*Development Plan Overlay Submission Emmanuel College June 2012 amended February 2013..*"
2. The submitted traffic report should be updated to reflect the (above) submitted plan;
3. The amended development plan documentation should state that any future planning permit issued generally in accordance with the approved development plan will include the following conditions on permit:-

   <u>New Access Points (Botanic Road and Ardlie Street)</u>

   a) Prior to commencement of works, a road safety audit will be undertaken and prepared by a suitably qualified person(s) and submitted to the satisfaction of the Responsible Authority.
   b) Prior to commencement of works, the access points must be designed to provide for the following:
      (i) Left turn exit only onto Botanic Road, no right turn exit from college land into Botanic Road will be permitted. Traffic management works are to be provided as identified in the road safety audit;
      (ii) Right turn and left turn entry into the college land will be permitted. Traffic management works are to be provided as identified in the road safety audit.
      (iii) Traffic management works along Ardlie Street as identified in the road safety audit report.

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Warrnambool Victoria Australia
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ABN 44 594 264 321

WARRNAMBOOL
CITY COUNCIL

4. Commentary to address the following, relevant, points:-

   a) Identify Appropriate Building Areas and Staging (as reflected on the submitted plan);
   b) Suitable road and pedestrian linkages between the site and adjacent areas;
   c) Outline arrangements for the provision and funding of physical infrastructure.

Council report scheduling would ideally see the proposal placed on public notice as soon as possible.

I have attached a copy of the referral responses for your information and records.

Yours Faithfully

Jodie McNamara
Co-ordinator of City Development.

Civic Centre 25 Liebig Street
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vicroads

South Western Region
180 Fyans Street
South Geelong Victoria 3220
PO Box 775 Geelong Victoria 3220

Telephone (03) 5225 2525
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vicroads.vic.gov.au

Ms Jodie McNamara

7 May 2013

Warrnambool City Council
P O Box 198
WARRNAMBOOL VIC 3280

Contact: Peter Gstrein
Your Ref: Development Plan – Emmanuel College
File No: SY-003-WRB-001

Dear Jodie

RE: EMMANUEL COLLEGE DEVELOPMENT PLAN
ROAD: BOTANIC ROAD, WARRNAMBOOL, 3280

I refer to the above Development Plan and advise that VicRoads supports the proposal in principle and provides the following comments:

VicRoads believes that the proposal to create an access to the development from Botanic, 60 metres from Raglan Parade may have the potential to cause undue stress on the Raglan Pde/Botanic Rd intersection. There is no proposal to signalise this intersection in the short to medium term;

This potential stress would be exacerbated by the imposition of left in/left out only traffic movements, as all traffic entering the access will have to approach via that intersection;

Thus, it is VicRoads belief that right turn entry should also be permitted (with only left turn exit movements). This may, however, create increased stress on Botanic Rd;

Given that the existing "Bus Interchange" does not have the capacity to accommodate the entire bus fleet required for the existing student population, let alone the forecast total including an increase of 200 students, investigation of a purpose-designed on-site Bus Interchange would be suggested.

Should you require further information, please contact Peter Gstrein at this office on telephone number: 5561 9214 or email: peter.gstrein@roads.vic.gov.au

Yours sincerely

BRYAN SHERRITT
MANAGER PROGRAM DEVELOPMENT
SOUTH WESTERN VICTORIA

The endorsed storm water management plan is to be implemented prior to use or occupation of the development.

Road Infrastructure Works

10. Before the commencement of any development works a detailed plan must be submitted to and endorsed by Council. The plan must be in accordance with current Council Design Guidelines and the approved Development Plan, and provide for the following.

e) Intersection of the New Access Road and Botanic Road

In relation to these works the following restrictions must be applied.

i. A left turn entry and left turn exit only with Botanic Road from the development.

ii. No public access active pick-up / drop-off activities are to be undertaken

f) Internal Access Roads and Car park areas.

g) Upgrade of Street lighting at the intersection of the New Access Road and Botanic Road

Prior to the use or occupation of the development, the following must be provided to the satisfaction of Council.

Construction Management Plan (CMP)

11. Prior to the commencement of any works of the development (including any preliminary site preparation and establishment works, demolition or material removal) a Construction Management Plan must be submitted to and approved by the Responsible Authority. The plan must include and address the following:

a) Details of Public Safety, Amenity Considerations and Site Security.

b) Environmental Management Plan (EMP) in accordance with the EPA document "Environmental Guidelines for Major Construction Sites" February 1996 or its successor document, including:

i. Operating Hours, Noise and Vibration Controls;
ii. Air and Dust Management;
iii. Stormwater and Sediment Control; and
iv. Waste and Materials Reuse Management.

c) Construction Program.

d) Traffic Management Plan.

e) Evidence of relevant authority approvals and insurance required to undertake works.

Date Issued: 15/4/2014	**Signature for the Responsible Authority:**
Note: Under Part 4, Division 1A of the Planning and Environment Act 1987, a permit may be amended. Please check with the responsible authority that this permit is the current permit and can be acted upon.	

APPENDIX D – PROPOSED MASTERPLAN (FULL DEVELOPMENT)

PROPOSED MASTERPLAN

SKETCH DESIGN - NOT FOR CONSTRUCTION

NORTH

Revision	Description	Date
G		10.11.22
H		25.11.22
J		17.11.23
K	INCLUSION OF 15 CRAWLEY ST	20.11.23

SCALE 1 : 1000 (A1) 1 : 2000 (A3)

0 10 50 100m

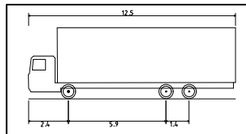
BALDASSO CORTESE
LEVEL 1/103 OXFORD ST
POST OFFICE BOX 1569
COLLINGWOOD VIC 3066
ABN 71 445 953 215
(T) +61 3 9417 7555
WWW.BCARCH.NET

140 Botanic Road, Warrnambool

PROPOSED MASTERPLAN

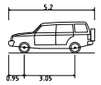
JOB NUMBER	DRW NUMBER	REV
20210026	SK201	K

APPENDIX E – SWEPT PATH ASSESSMENT



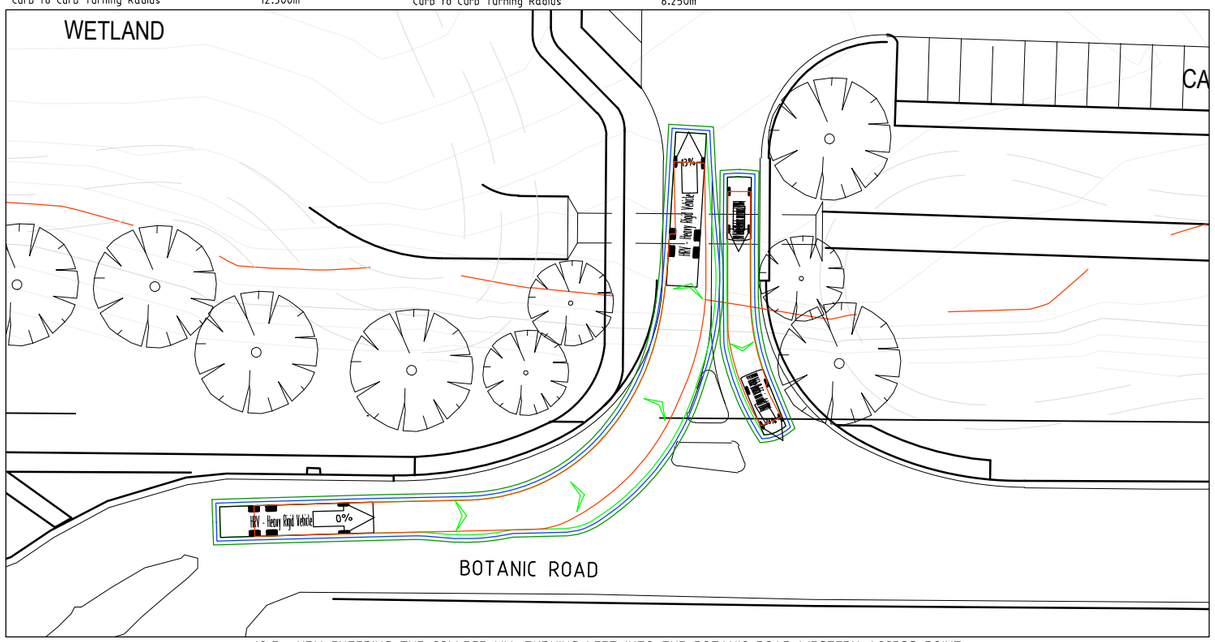
HRV - Heavy Rigid Vehicle

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

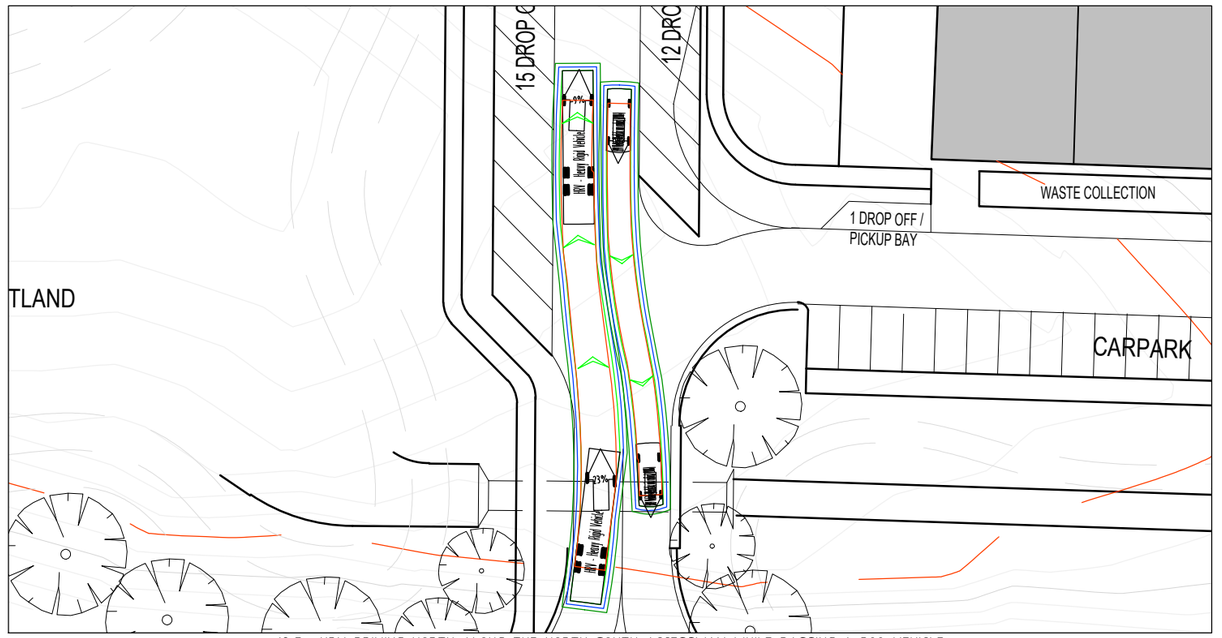


B99 Vehicle (Realistic min radius) (2004)

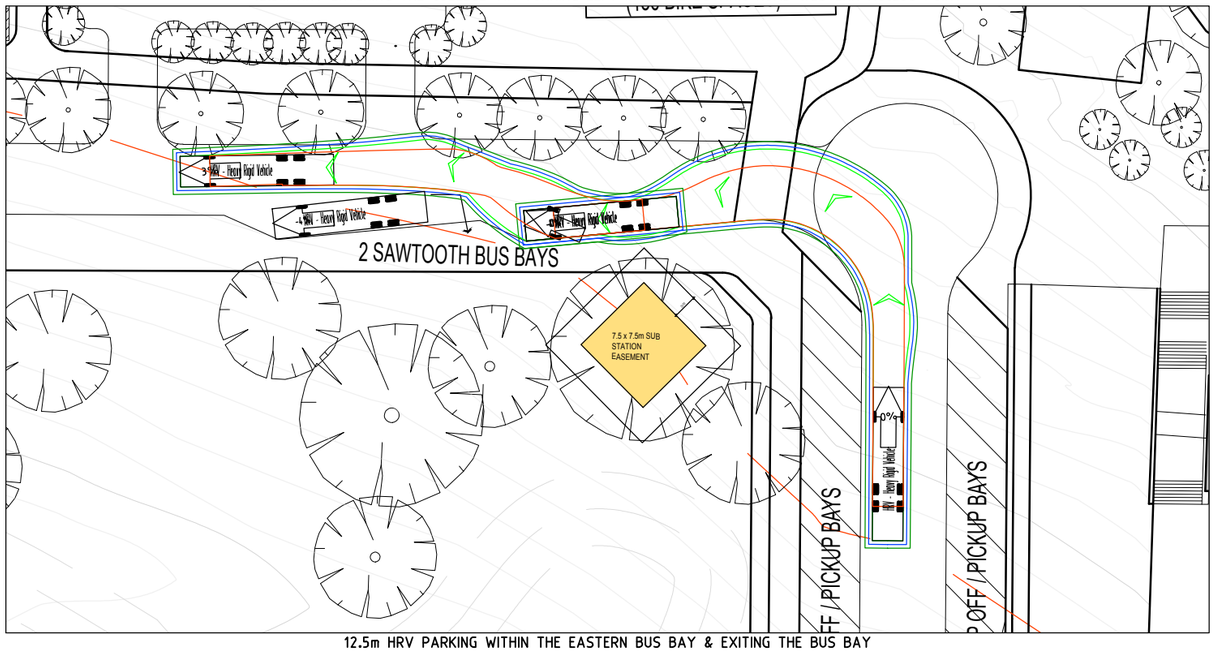
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m



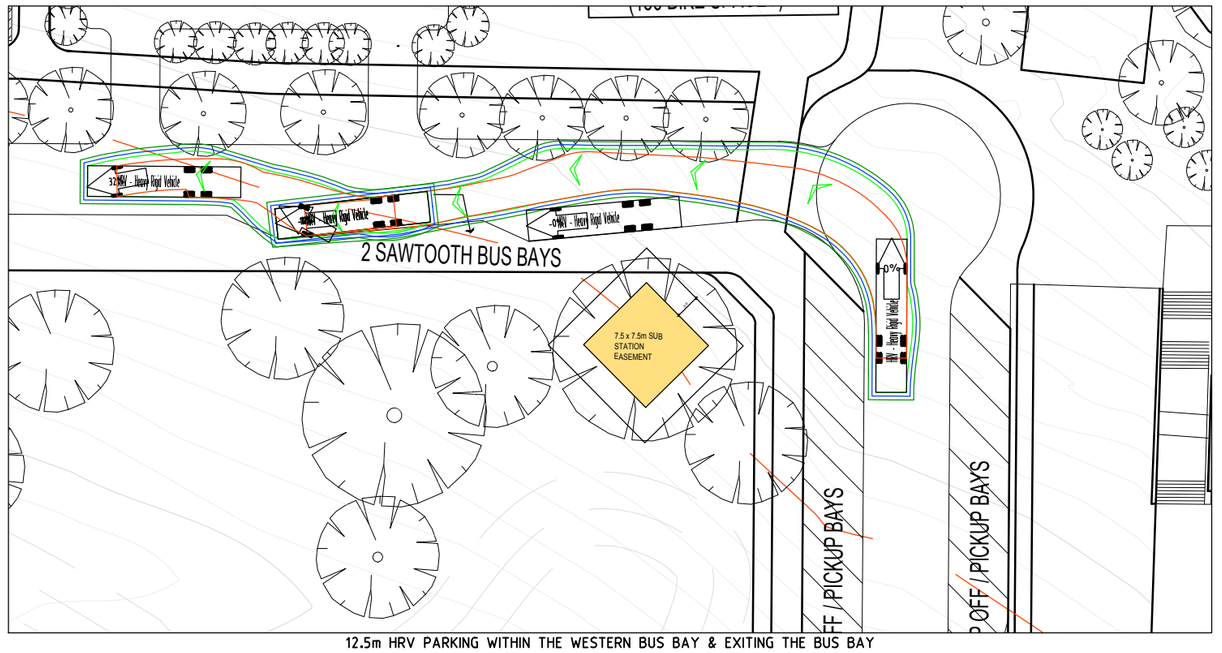
12.5m HRV ENTERING THE COLLEGE VIA TURNING LEFT INTO THE BOTANIC ROAD WESTERN ACCESS POINT



12.5m HRV DRIVING NORTH ALONG THE NORTH-SOUTH ACCESSWAY WHILE PASSING A B99 VEHICLE



12.5m HRV PARKING WITHIN THE EASTERN BUS BAY & EXITING THE BUS BAY



12.5m HRV PARKING WITHIN THE WESTERN BUS BAY & EXITING THE BUS BAY

No.	REVISION	DATE	DES/DFT	APPR'D
B	LAYOUT PLAN UPDATED.	22.05.24	T.D.	M.M.
A	LAYOUT PLAN UPDATED.	15.12.23	T.D.	M.M.

LEGEND

- WHEEL PATH (FORWARD)
- WHEEL PATH (REVERSE)
- BODY OUTLINE (FORWARD)
- BODY OUTLINE (REVERSE))
- 300mm BODY CLEARANCE (FORWARD)
- 300mm BODY CLEARANCE (REVERSE)
- 600mm BODY CLEARANCE (FORWARD)
- 600mm BODY CLEARANCE (REVERSE)

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3 Prentice Street, Brunswick, VIC, 3056
Phone: +61 3 9862 3479 | Email: info@tatsolutions.com.au
Transport & Traffic Studies | Parking Studies | Traffic Management
Road Safety | Traffic Engineering | Civil Engineering

Drawn: T. Dinh
Designed: T. Dinh
Checked: M. Marsicovetere
Approved: M. Marsicovetere

Project: EMMANUEL COLLEGE, WARRNAMBOOL

Title: Swept Path Assessment - 1
12.5m Long HRV (Bus)
Entering, On-site Circulation & Parking

Client: Emmanuel College
140 Botanic Road
Warrnambool VIC 3280

Drawing No.: 22001EC-00-301
Revision: B
Drawing Status: Issued for Approval
Not to be used for construction
Sheet: 1 of 4
Date: 10.05.22
Scale: 1:500 (0 2.5 5 10)
Size: A3

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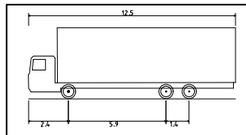
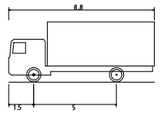


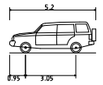
HRV - Heavy Rigid Vehicle

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m



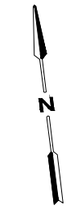
MRV - Medium Rigid Vehicle

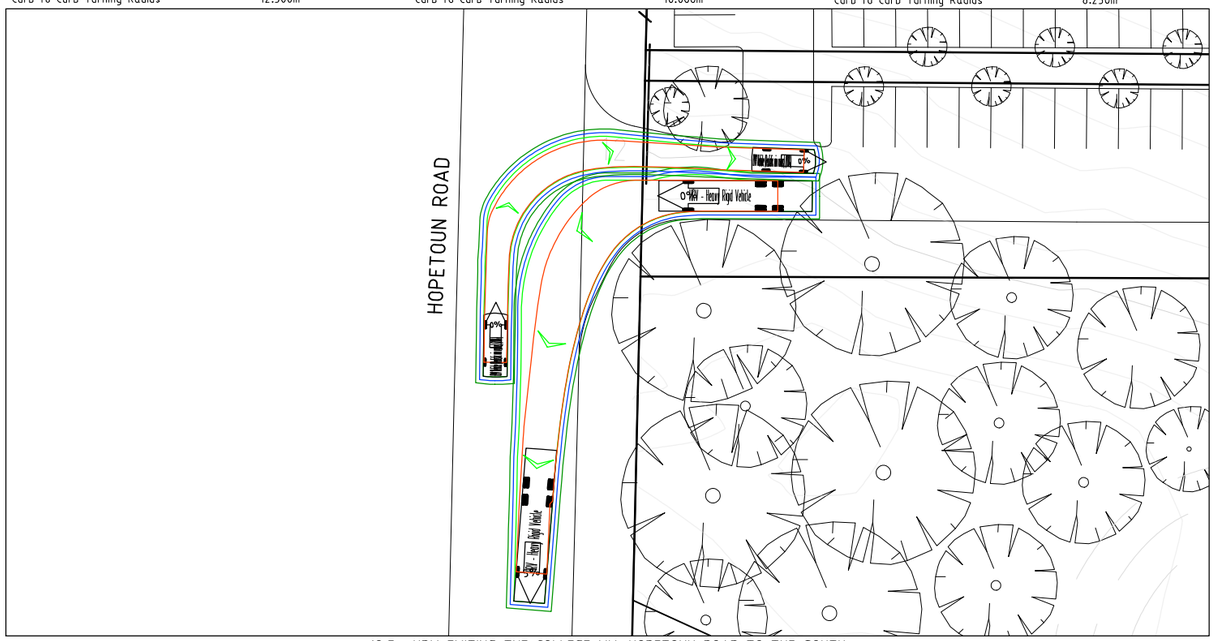
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



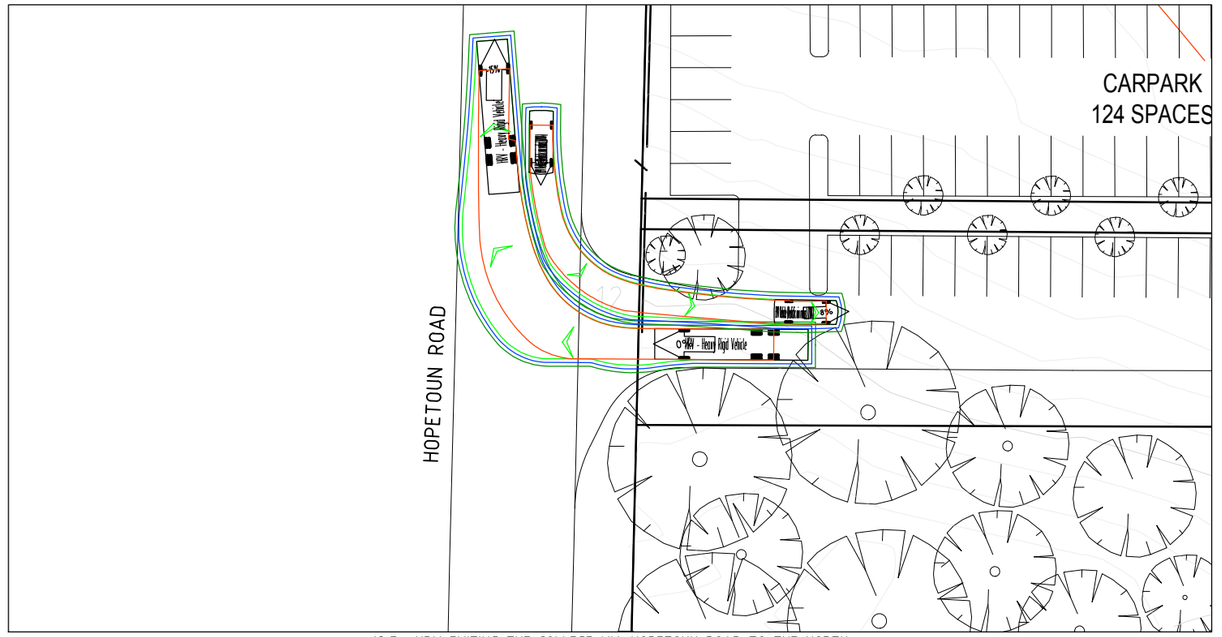
B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

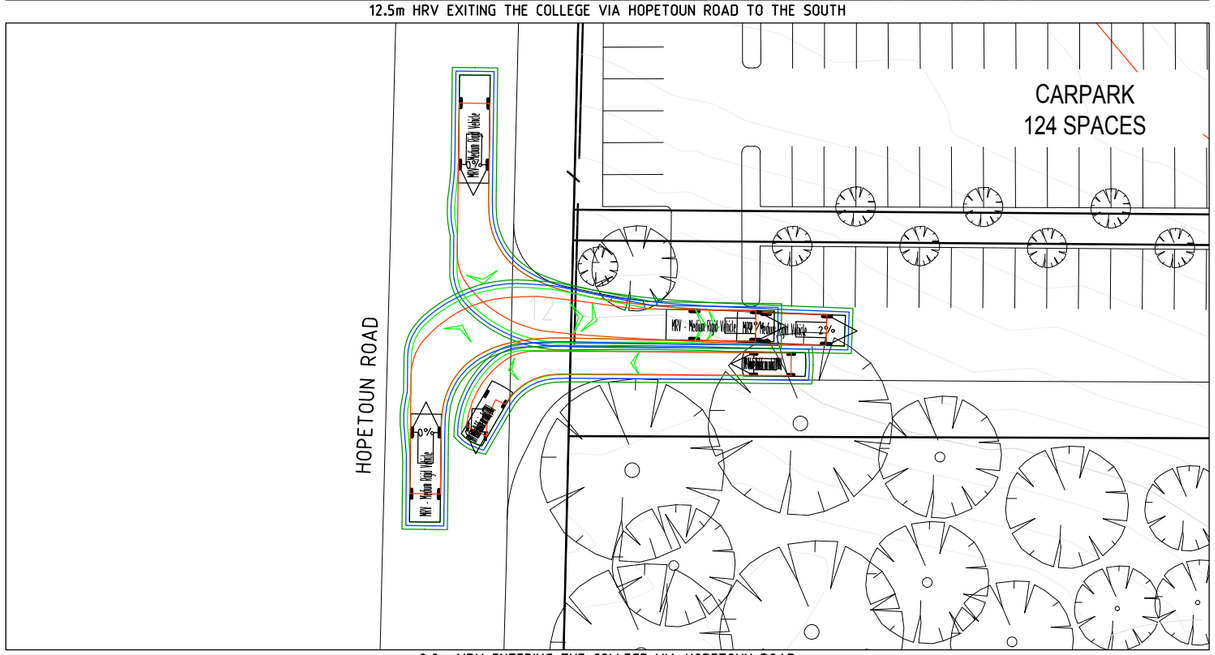




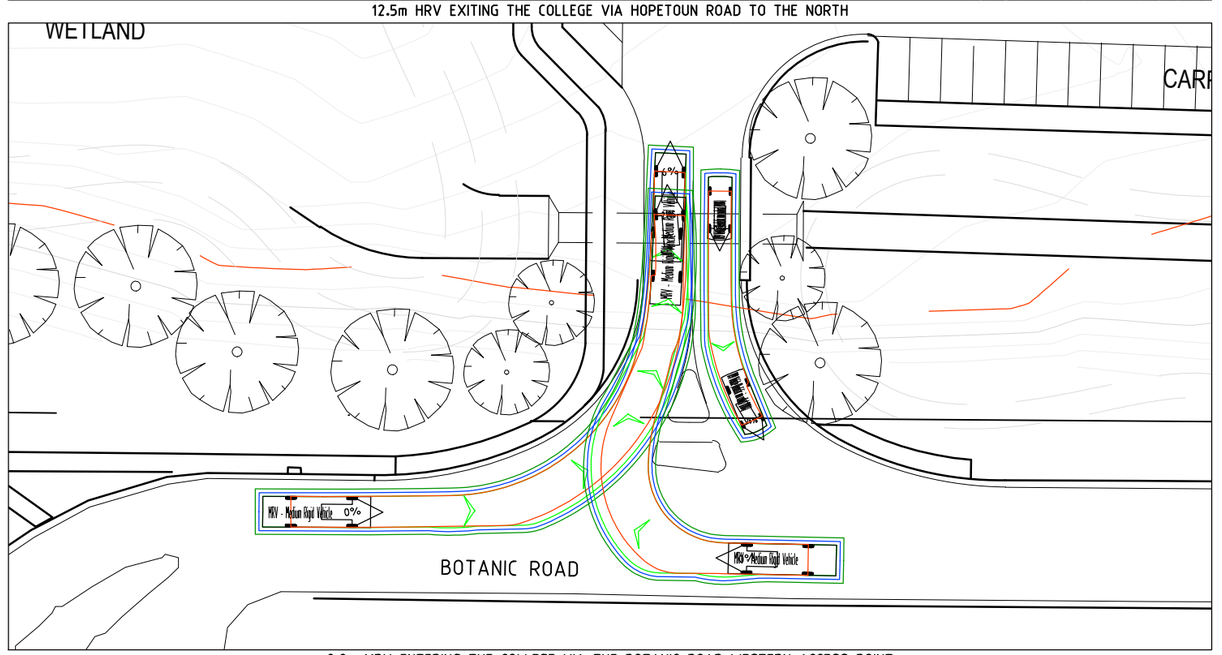
12.5m HRV EXITING THE COLLEGE VIA HOPETOUN ROAD TO THE SOUTH



12.5m HRV EXITING THE COLLEGE VIA HOPETOUN ROAD TO THE NORTH



8.8m MRV ENTERING THE COLLEGE VIA HOPETOUN ROAD



8.8m MRV ENTERING THE COLLEGE VIA THE BOTANIC ROAD WESTERN ACCESS POINT

No.	REVISION	DATE	DES/DFT	APPR'D
B	LAYOUT PLAN UPDATED.	22.05.24	T.D.	M.M.
A	LAYOUT PLAN UPDATED.	15.12.23	T.D.	M.M

LEGEND

- WHEEL PATH (FORWARD)
- WHEEL PATH (REVERSE)
- BODY OUTLINE (FORWARD)
- BODY OUTLINE (REVERSE))
- 300mm BODY CLEARANCE (FORWARD)
- 300mm BODY CLEARANCE (REVERSE)
- 600mm BODY CLEARANCE (FORWARD)
- 600mm BODY CLEARANCE (REVERSE)

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Transport & Traffic Studies | Parking Studies | Traffic Management
Road Safety | Traffic Engineering | Civil Engineering

Drawn	T. Dinh
Designed	T. Dinh
Checked	M. Marsicovetere
Approved	M. Marsicovetere

Project	EMMANUEL COLLEGE, WARRNAMBOOL
Title	Swept Path Assessment - 2 12.5m Long HRV & 8.8m Long MRV HRV Exiting & MRV Entering
Client	Emmanuel College 140 Botanic Road Warrnambool VIC 3280

Drawing No.	22001EC-00-302
Revision	B
Drawing Status	Issued for Approval Not to be used for construction
Sheet	2 of 4
Date	10.05.22
Scale	1:500 (0 2.5 5 10)
Size	A3

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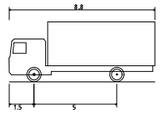

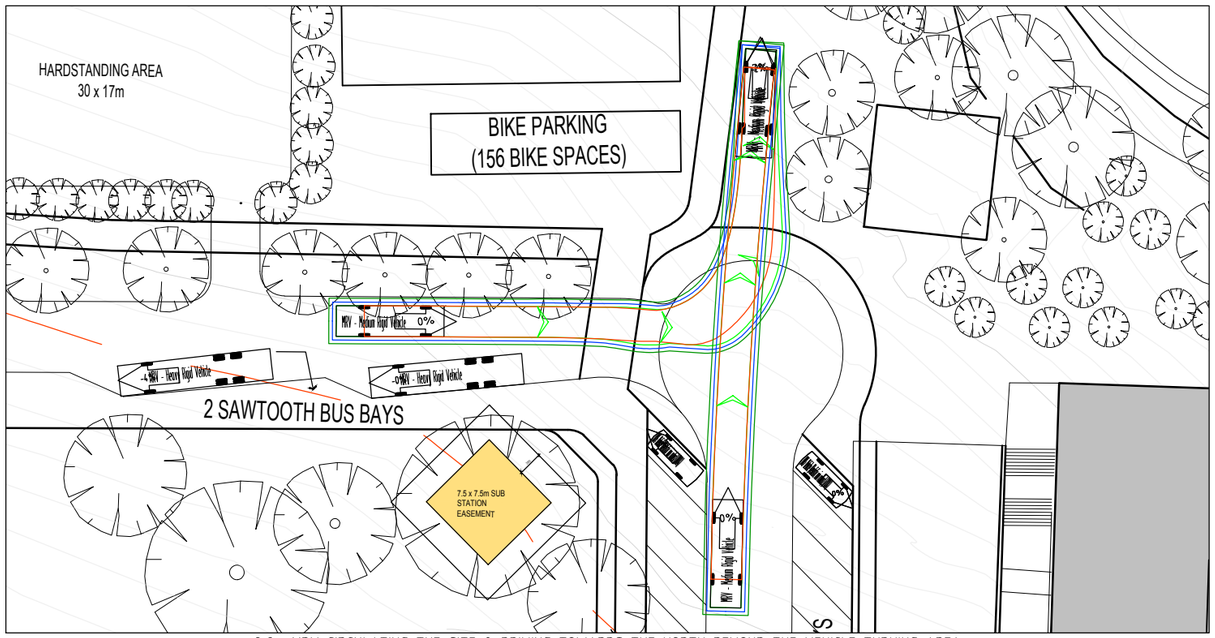

MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

8.8m MRV CIRCULATING THE SITE & DRIVING TOWARDS THE NORTH BEYOND THE VEHICLE TURNING AREA

8.8m MRV ENTERING THE COLLEGE VIA THE BOTANIC ROAD CENTRAL ACCESS POINT (ENTRY)

8.8m MRV CIRCULATING THE SITE & PERFORMING WASTE COLLECTION SOUTH OF THE F BLOCK BUILDING

8.8m MRV EXITING THE COLLEGE VIA THE BOTANIC ROAD ACCESS POINT (EXIT)

No.	REVISION	DATE	DES/DFT	APPR'D
B	LAYOUT PLAN UPDATED.	22.05.24	T.D.	M.M.
A	LAYOUT PLAN UPDATED.	15.12.23	T.D.	M.M.

LEGEND

- WHEEL PATH (FORWARD)
- WHEEL PATH (REVERSE)
- BODY OUTLINE (FORWARD)
- BODY OUTLINE (REVERSE))
- 300mm BODY CLEARANCE (FORWARD)
- 300mm BODY CLEARANCE (REVERSE)
- 600mm BODY CLEARANCE (FORWARD)
- 600mm BODY CLEARANCE (REVERSE)

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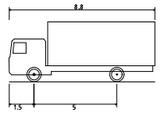
Road Safety | Traffic Engineering | Civil Engineering

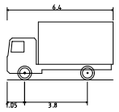
Drawn	T. Dinh
Designed	T. Dinh
Checked	M. Marsicovetere
Approved	M. Marsicovetere
Project	EMMANUEL COLLEGE, WARRNAMBOOL
Title	Swept Path Assessment - 3 8.8m Long MRV - Entering & Exiting On-site Circulation & Waste Collection
Client	Emmanuel College 140 Botanic Road Warrnambool VIC 3280
Drawing No.	22001EC-00-303
Revision	B
Drawing Status	Issued for Approval Not to be used for construction
Sheet	3 of 4
Date	10.05.22
Scale	0 2.5 5 10 1:500
Size	A3

C:\Users\Tony Dinh\Box Sync\Projects\22001_Emmanual College\Design\Drawings\22001EC-00-301.dwg



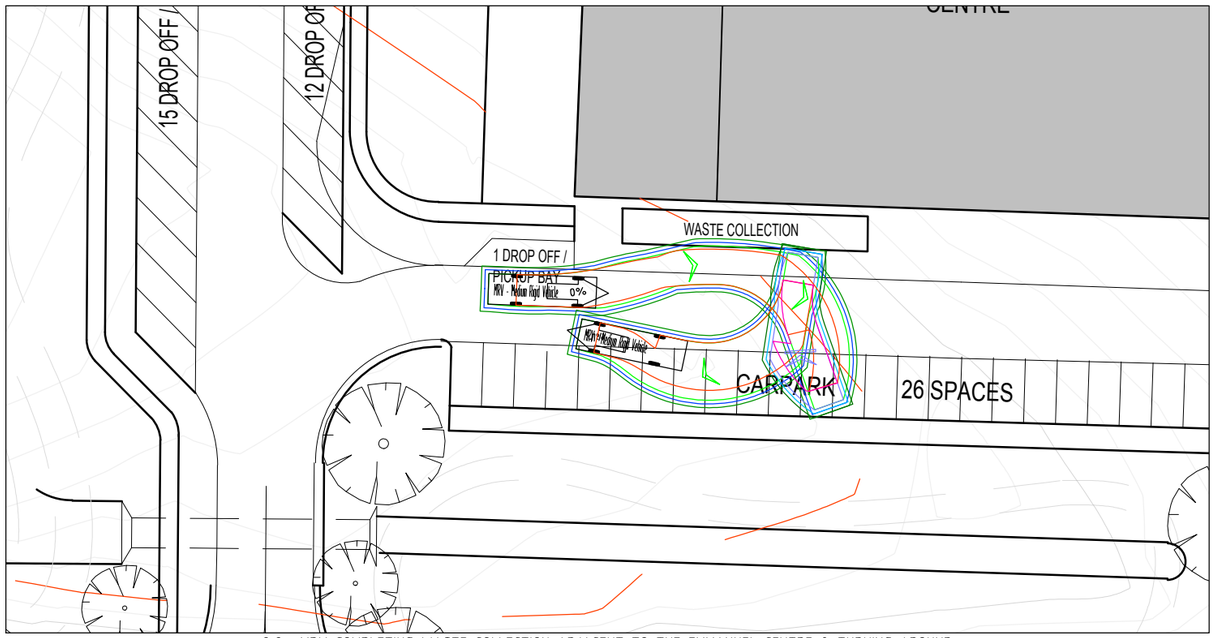
MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

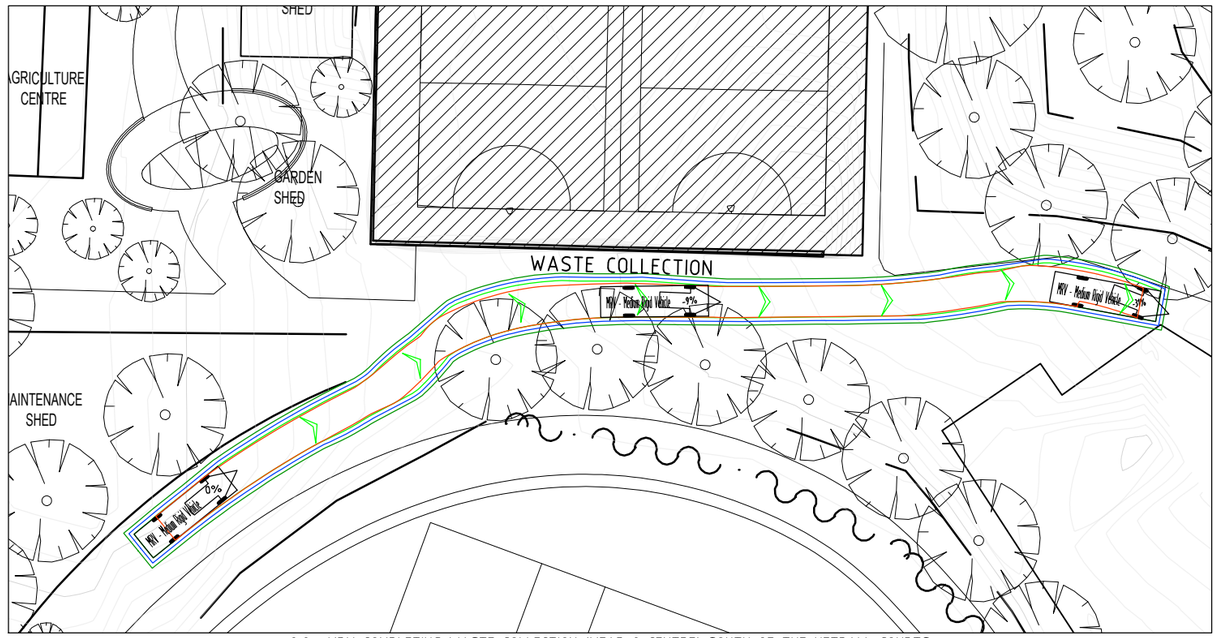


SRV - Small Rigid Vehicle

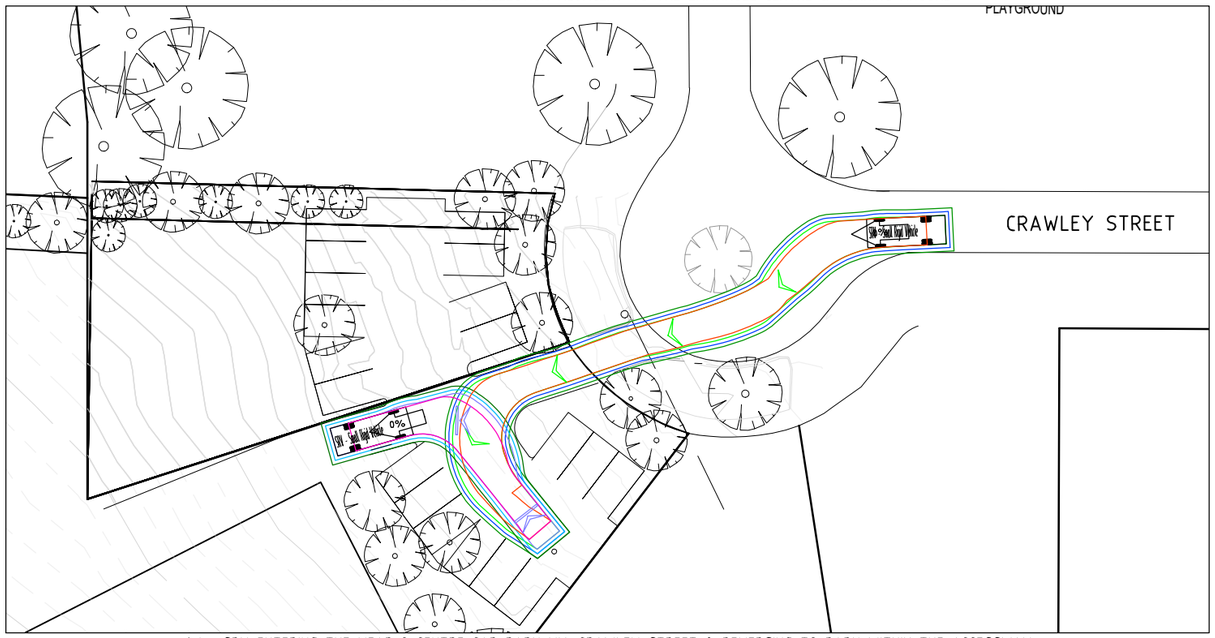
Overall Length	6.400m
Overall Width	2.330m
Overall Body Height	3.500m
Min Body Ground Clearance	0.398m
Track Width	2.330m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m



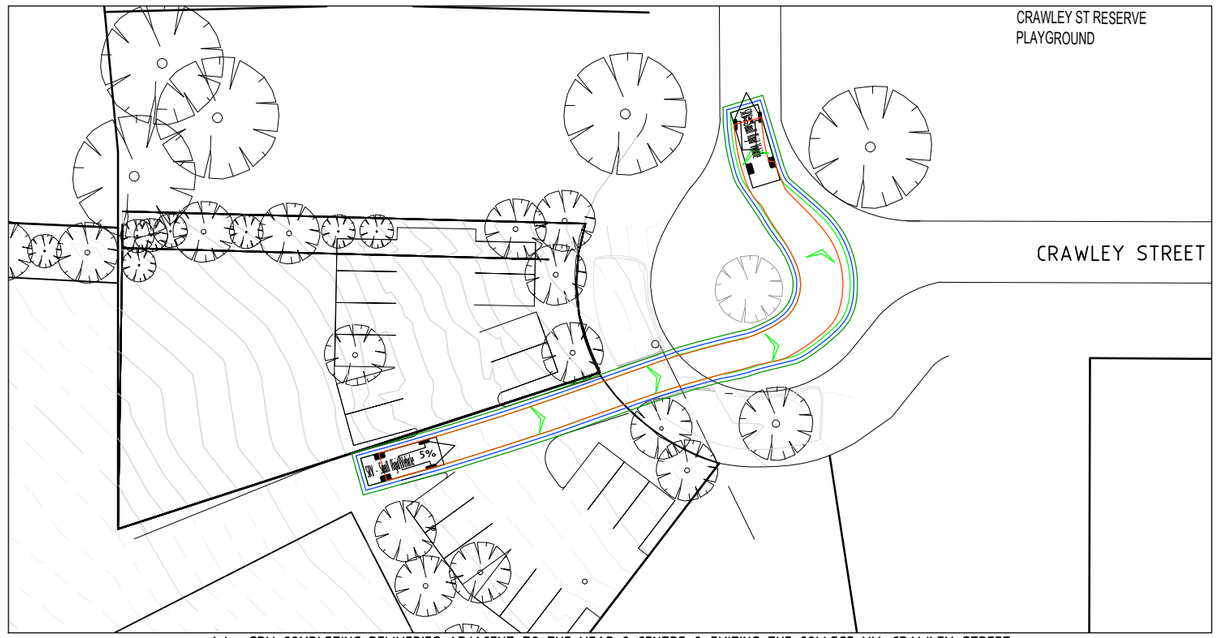
8.8m MRV COMPLETING WASTE COLLECTION ADJACENT TO THE EMMANUEL CENTRE & TURNING AROUND



8.8m MRV COMPLETING WASTE COLLECTION (YEAR 9 CENTRE) SOUTH OF THE NETBALL COURTS



6.4m SRV ENTERING THE YEAR 9 CENTRE CAR PARK VIA CRAWLEY STREET & REVERSING TO PARK WITHIN THE ACCESSWAY



6.4m SRV COMPLETING DELIVERIES ADJACENT TO THE YEAR 9 CENTRE & EXITING THE COLLEGE VIA CRAWLEY STREET

No.	REVISION	DATE	DES/DFT	APPR'D
B	LAYOUT PLAN UPDATED.	22.05.24	T.D.	M.M.
A	LAYOUT PLAN UPDATED.	15.12.23	T.D.	M.M.

LEGEND
- WHEEL PATH (FORWARD)
- WHEEL PATH (REVERSE)
- BODY OUTLINE (FORWARD)
- BODY OUTLINE (REVERSE))
- 300mm BODY CLEARANCE (FORWARD)
- 300mm BODY CLEARANCE (REVERSE)
- 600mm BODY CLEARANCE (FORWARD)
- 600mm BODY CLEARANCE (REVERSE)

T&TS TRANSPORT & TRAFFIC SOLUTIONS
Transport & Traffic Solutions Pty Ltd
ABN 56 156 612 707
3 Prentice Street, Brunswick, VIC, 3056
Phone: +61 3 9862 3479 | Email: info@tatsolutions.com.au
Transport & Traffic Studies | Parking Studies | Traffic Management
Road Safety | Traffic Engineering | Civil Engineering

Drawn: T. Dinh
Designed: T. Dinh
Checked: M. Marsicovetere
Approved: M. Marsicovetere

Project: EMMANUEL COLLEGE, WARRNAMBOOL

Title: Swept Path Assessment - 4
8.8m Long MRV Waste Collection
6.4m SRV Enter/Exit the Year 9 Centre & Deliveries

Client: Emmanuel College
140 Botanic Road
Warrnambool VIC 3280

Drawing No. 22001EC-00-304
Revision B
Drawing Status: Issued for Approval
Not to be used for construction
Sheet 4 of 4
Date 10.05.22
Scale 1:500 (0 2.5 5 10)
Size A3

C:\Users\Tony Dinh\Box Sync\Projects\22001_Emmanual College\Design\Drawings\22001EC-00-301.dwg

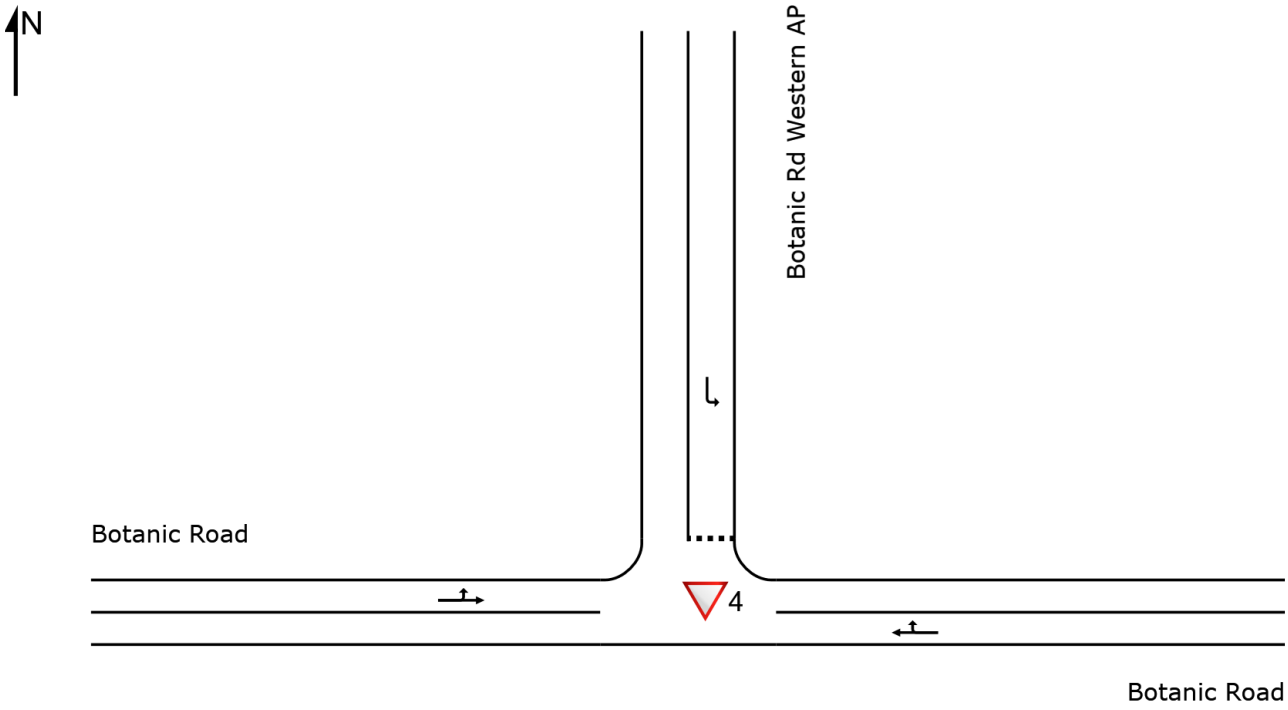
APPENDIX F – BOTANIC ROAD WESTERN ACCESS POINT & HOPETOUN ROAD ACCESS POINT FUTURE YEAR SIDRA ANALYSIS RESULTS

SITE LAYOUT

Site: 4 [Botanic Rd/ Botanic Rd Western Access Point - Future AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

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



LANE SUMMARY

Site: 4 [Botanic Rd/ Botanic Rd Western Access Point - Future AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Botanic Road													
Lane 1	362	1.0	1215	0.298	100	5.1	LOS A	1.8	12.5	Full	240	0.0	0.0
Approach	362	1.0		0.298		5.1	NA	1.8	12.5				
North: Botanic Rd Western AP													
Lane 1	396	1.0	1233	0.321	100	4.8	LOS A	1.5	10.8	Full	100	0.0	0.0
Approach	396	1.0		0.321		4.8	LOS A	1.5	10.8				
West: Botanic Road													
Lane 1	520	6.5	1850	0.281	100	1.5	LOS A	0.0	0.0	Full	60	0.0	0.0
Approach	520	6.5		0.281		1.5	NA	0.0	0.0				
Intersection	1278	3.2		0.321		3.6	NA	1.8	12.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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: 4 [Botanic Rd/ Botanic Rd Western Access Point - Future AM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	HV] %	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
East: Botanic Road														
5	T1	60	3.0	120	3.0	0.298	2.7	LOS A	1.8	12.5	0.59	0.51	0.64	33.8
6	R2	121	0.0	242	0.0	0.298	6.3	LOS A	1.8	12.5	0.59	0.51	0.64	34.4
Approach		181	1.0	362	1.0	0.298	5.1	NA	1.8	12.5	0.59	0.51	0.64	34.3
North: Botanic Rd Western AP														
7	L2	198	1.0	396	1.0	0.321	4.8	LOS A	1.5	10.8	0.44	0.59	0.44	34.7
Approach		198	1.0	396	1.0	0.321	4.8	LOS A	1.5	10.8	0.44	0.59	0.44	34.7
West: Botanic Road														
10	L2	115	2.0	230	2.0	0.281	3.4	LOS A	0.0	0.0	0.00	0.20	0.00	37.0
11	T1	145	10.0	290	10.0	0.281	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	37.8
Approach		260	6.5	520	6.5	0.281	1.5	NA	0.0	0.0	0.00	0.20	0.00	37.6
All Vehicles		639	3.2	1278	3.2	0.321	3.6	NA	1.8	12.5	0.30	0.41	0.32	35.5

Site Level of Service (LOS) Method: Delay (SIDRA). 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.

LANE SUMMARY

Site: 4 [Botanic Rd/ Botanic Rd Western Access Point - Future PM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Botanic Rd Western AP													
Lane 1	194	0.0	1632	0.119	100	2.2	LOS A	0.5	3.5	Full	240	0.0	0.0
Approach	194	0.0		0.119		2.2	NA	0.5	3.5				
North: Botanic Rd Western AP													
Lane 1	360	0.0	1247	0.289	100	4.7	LOS A	1.3	9.4	Full	100	0.0	0.0
Approach	360	0.0		0.289		4.7	LOS A	1.3	9.4				
West: Botanic Road													
Lane 1	362	3.2	1912	0.189	100	0.6	LOS A	0.0	0.0	Full	60	0.0	0.0
Approach	362	3.2		0.189		0.6	NA	0.0	0.0				
Intersection	916	1.3		0.289		2.6	NA	1.3	9.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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: 4 [Botanic Rd/ Botanic Rd Western Access Point - Future PM Peak (Site Folder: Emmanuel College)]

Existing Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	INPUT VOLUMES HV] %	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Botanic Rd Western AP														
5	T1	63	0.0	126	0.0	0.119	0.8	LOS A	0.5	3.5	0.33	0.20	0.33	36.7
6	R2	34	0.0	68	0.0	0.119	4.9	LOS A	0.5	3.5	0.33	0.20	0.33	37.1
Approach		97	0.0	194	0.0	0.119	2.2	NA	0.5	3.5	0.33	0.20	0.33	36.8
North: Botanic Rd Western AP														
7	L2	180	0.0	360	0.0	0.289	4.7	LOS A	1.3	9.4	0.43	0.58	0.43	34.8
Approach		180	0.0	360	0.0	0.289	4.7	LOS A	1.3	9.4	0.43	0.58	0.43	34.8
West: Botanic Road														
10	L2	34	0.0	68	0.0	0.189	3.4	LOS A	0.0	0.0	0.00	0.09	0.00	39.2
11	T1	147	4.0	294	4.0	0.189	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	39.0
Approach		181	3.2	362	3.2	0.189	0.6	NA	0.0	0.0	0.00	0.09	0.00	39.0
All Vehicles		458	1.3	916	1.3	0.289	2.6	NA	1.3	9.4	0.24	0.30	0.24	36.6

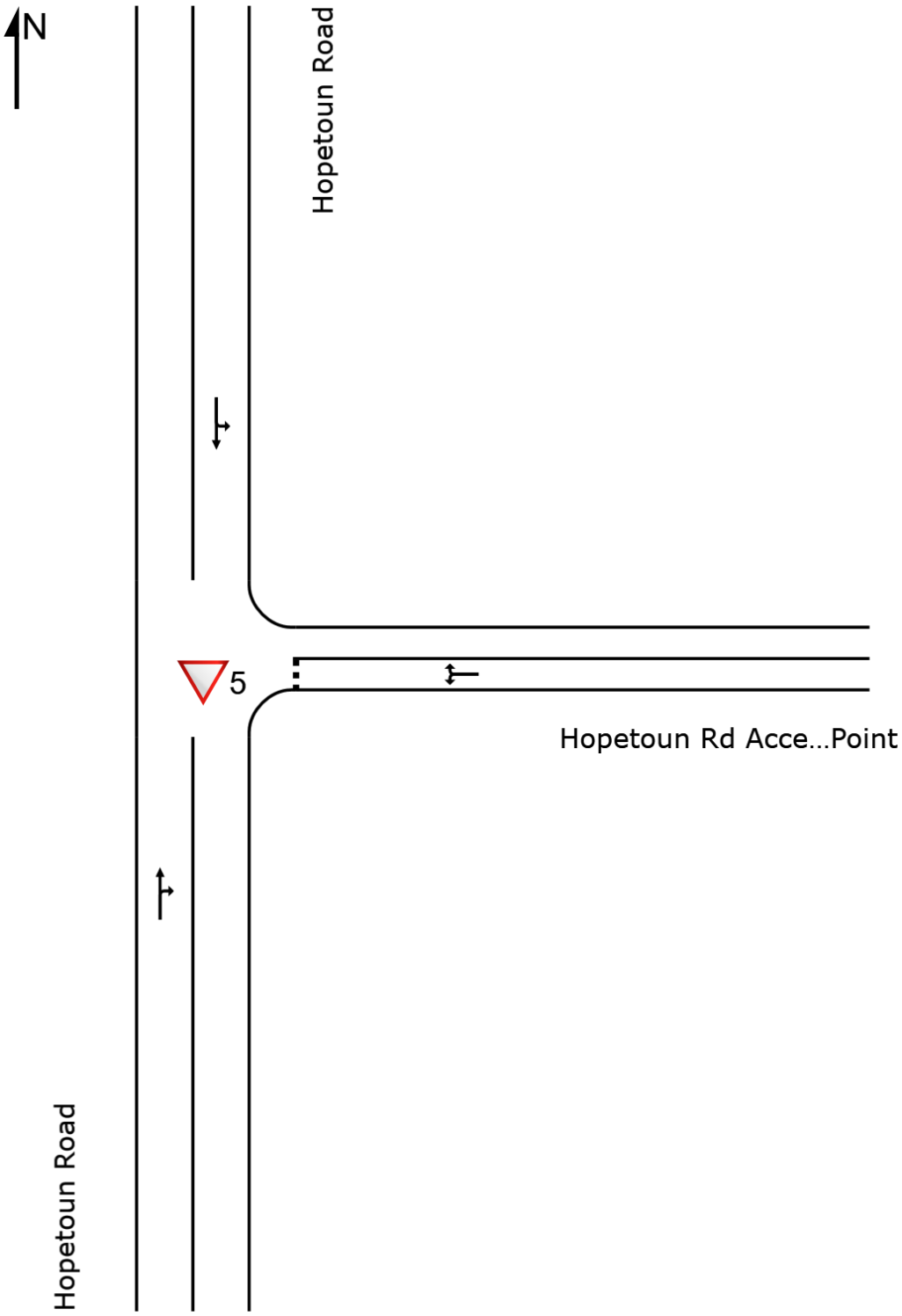
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and 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.

SITE LAYOUT

Site: 5 [Hopetoun Rd/ Hopetoun Rd Access Point - Future AM Peak (Site Folder: Emmanuel College)]

New Site
Site Category: (None)
Give-Way (Two-Way)

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



LANE SUMMARY

Site: 5 [Hopetoun Rd/ Hopetoun Rd Access Point - Future AM Peak (Site Folder: Emmanuel College)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Hopetoun Road													
Lane 1	154	1.0	1666	0.092	100	2.9	LOS A	0.5	3.2	Full	80	0.0	0.0
Approach	154	1.0		0.092		2.9	NA	0.5	3.2				
East: Hopetoun Rd Access Point													
Lane 1	4	0.0	1163	0.003	100	4.2	LOS A	0.0	0.1	Full	80	0.0	0.0
Approach	4	0.0		0.003		4.2	LOS A	0.0	0.1				
North: Hopetoun Road													
Lane 1	178	9.8	1973	0.090	100	0.9	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	178	9.8		0.090		0.9	NA	0.0	0.0				
Intersection	336	5.6		0.092		1.8	NA	0.5	3.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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: 5 [Hopetoun Rd/ Hopetoun Rd Access Point - Future AM Peak (Site Folder: Emmanuel College)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	INPUT VOLUMES HV] %	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hopetoun Road														
5	T1	26	3.0	52	3.0	0.092	0.6	LOS A	0.5	3.2	0.29	0.33	0.29	37.6
6	R2	51	0.0	102	0.0	0.092	4.1	LOS A	0.5	3.2	0.29	0.33	0.29	32.8
Approach		77	1.0	154	1.0	0.092	2.9	NA	0.5	3.2	0.29	0.33	0.29	35.7
East: Hopetoun Rd Access Point														
7	L2	1	0.0	2	0.0	0.003	3.8	LOS A	0.0	0.1	0.25	0.46	0.25	31.7
9	R2	1	0.0	2	0.0	0.003	4.6	LOS A	0.0	0.1	0.25	0.46	0.25	37.0
Approach		2	0.0	4	0.0	0.003	4.2	LOS A	0.0	0.1	0.25	0.46	0.25	35.6
North: Hopetoun Road														
10	L2	22	0.0	44	0.0	0.090	3.4	LOS A	0.0	0.0	0.00	0.12	0.00	39.5
11	T1	67	13.0	134	13.0	0.090	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	39.3
Approach		89	9.8	178	9.8	0.090	0.9	NA	0.0	0.0	0.00	0.12	0.00	39.4
All Vehicles		168	5.6	336	5.6	0.092	1.8	NA	0.5	3.2	0.14	0.22	0.14	38.1

Site Level of Service (LOS) Method: Delay (SIDRA). 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.

LANE SUMMARY

Site: 5 [Hopetoun Rd/ Hopetoun Rd Access Point - Future PM Peak (Site Folder: Emmanuel College)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Hopetoun Road													
Lane 1	134	3.0	2072	0.065	100	0.1	LOS A	0.0	0.1	Full	80	0.0	0.0
Approach	134	3.0		0.065		0.1	NA	0.0	0.1				
East: Hopetoun Rd Access Point													
Lane 1	146	0.0	1313	0.111	100	4.0	LOS A	0.4	3.0	Full	80	0.0	0.0
Approach	146	0.0		0.111		4.0	LOS A	0.4	3.0				
North: Hopetoun Road													
Lane 1	110	12.8	1958	0.056	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	110	12.8		0.056		0.1	NA	0.0	0.0				
Intersection	390	4.6		0.111		1.5	NA	0.4	3.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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: 5 [Hopetoun Rd/ Hopetoun Rd Access Point - Future PM Peak (Site Folder: Emmanuel College)]

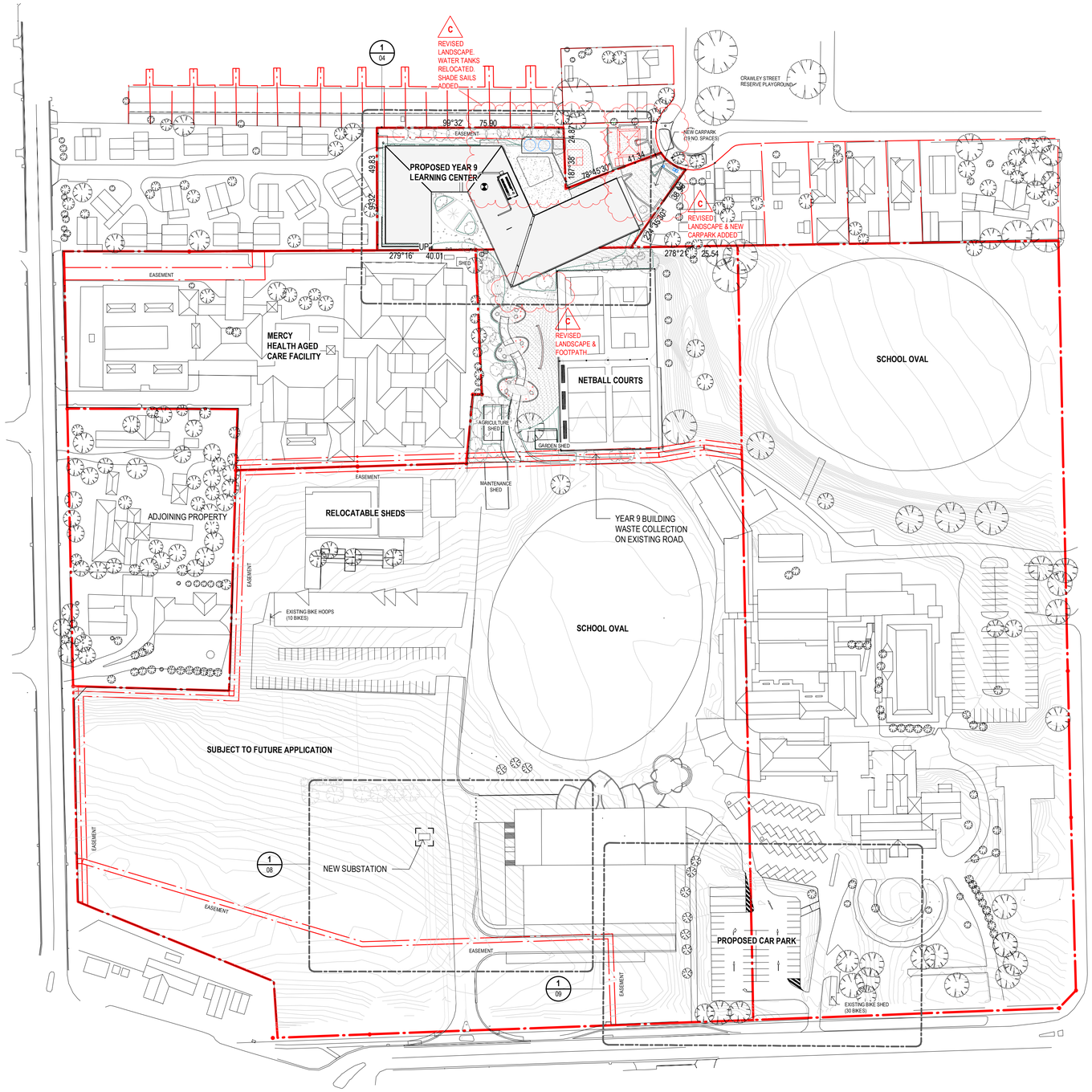
New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/30min]	INPUT VOLUMES HV] %	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hopetoun Road														
5	T1	66	3.0	132	3.0	0.065	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	39.9
6	R2	1	0.0	2	0.0	0.065	3.8	LOS A	0.0	0.1	0.01	0.01	0.01	39.9
Approach		67	3.0	134	3.0	0.065	0.1	NA	0.0	0.1	0.01	0.01	0.01	39.9
East: Hopetoun Rd Access Point														
7	L2	51	0.0	102	0.0	0.111	3.8	LOS A	0.4	3.0	0.22	0.47	0.22	31.9
9	R2	22	0.0	44	0.0	0.111	4.5	LOS A	0.4	3.0	0.22	0.47	0.22	37.0
Approach		73	0.0	146	0.0	0.111	4.0	LOS A	0.4	3.0	0.22	0.47	0.22	34.8
North: Hopetoun Road														
10	L2	1	0.0	2	0.0	0.056	3.4	LOS A	0.0	0.0	0.00	0.01	0.00	40.2
11	T1	54	13.0	108	13.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	39.9
Approach		55	12.8	110	12.8	0.056	0.1	NA	0.0	0.0	0.00	0.01	0.00	39.9
All Vehicles		195	4.6	390	4.6	0.111	1.5	NA	0.4	3.0	0.09	0.18	0.09	38.6

Site Level of Service (LOS) Method: Delay (SIDRA). 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.

APPENDIX B – STAGE 1 SITE PLAN & ENDORSED PLAN



1 SITE PLAN

SCALE - 1 : 1000

Revision	Description	Date
A	TOWN PLANNING SUBMISSION	29.09.22
B	REVISED TP SET - RFI REPONSES	01.12.22
C	SECONDARY CONSENT ISSUE	21.12.23

TOWN PLANNING
NOT FOR CONSTRUCTION

CLIENT
EMMANUEL COLLEGE

PROJECT TITLE
EDMUND RICE - YEAR 9 CENTRE

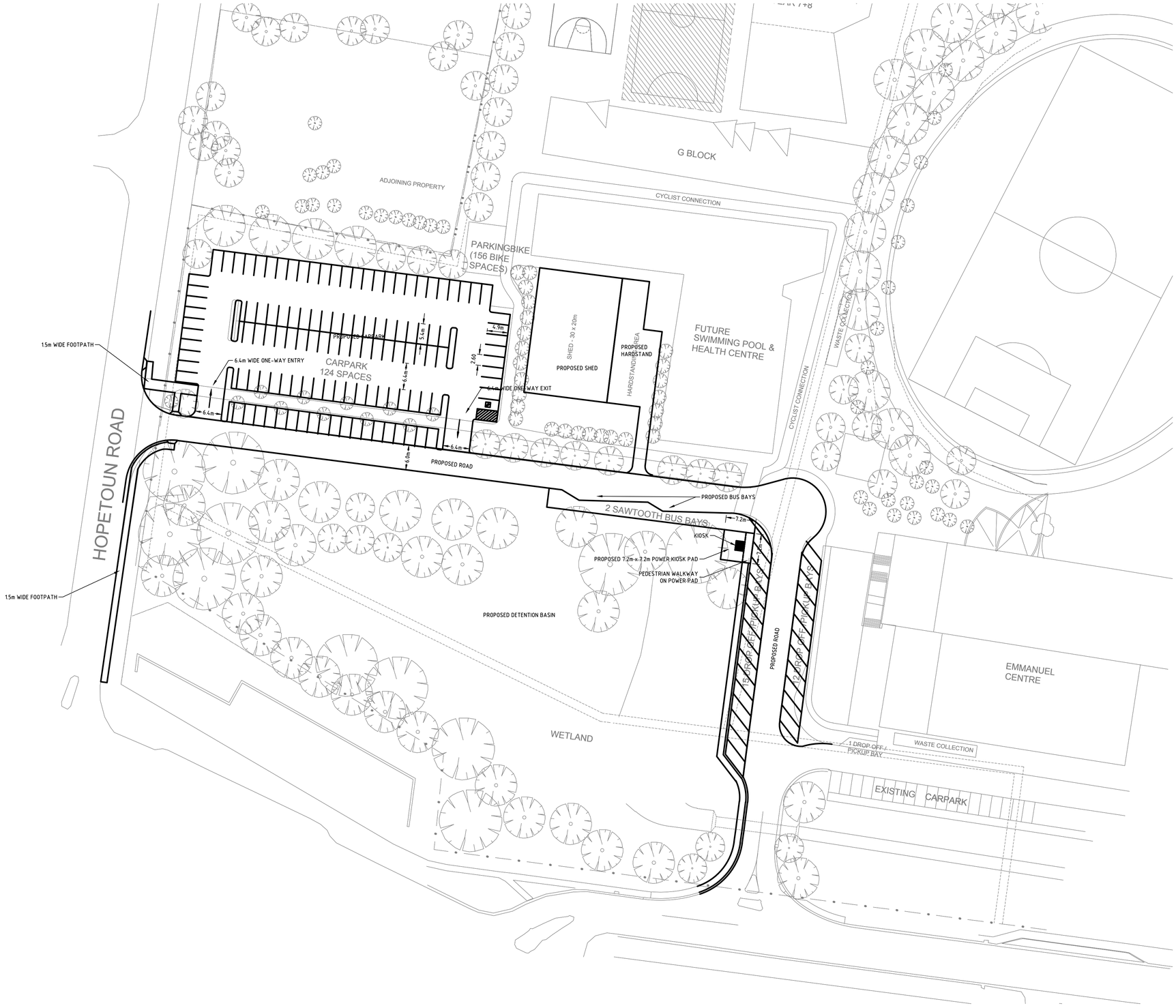
ADDRESS
140 BOTANIC ROAD, WARRNAMBOOL, VICTORIA 3280

DRAWING TITLE
SITE PLAN

NORTH

CHECKED: TP
DRAWN: TP / ZJC
DATE: 21.12.23
SCALE @ A1: 1 : 1000
PROJECT NO.: 20210078
DRAWING NO.: 06
REVISION: C

BALDASSO CORTESE
INCORPORATING DOIG ARCHITECTURE
BAADE HARBOUR GEELONG
ARCHITECTURE | INTERIOR DESIGN | MASTERPLANNING
LEVEL 1, 103 OXFORD STREET, COLLINGWOOD VIC 3066
(T) +61 3 9417 7555 www.bcarch.net admin@bcarch.net
ABN: 71 445 953 215



WARRNAMBOOL PLANNING SCHEME
Plans approved for
Permit: PP2023-0047
On the: 13/6/2023
Delegate: R. Wandell 1 of 7

NOTE: UNDERGROUND SERVICES IN AREA OF CONSTRUCTION, CONTRACTOR TO LOCATE & DEPTH ALL SERVICES PRIOR TO CONSTRUCTION

PROPOSED LAYOUT PLAN

SCALE 1:500

REV.	DESCRIPTION	DATE
C	ISSUE FOR PLANNING APPLICATION	06/03/2023
B	ADDED CARPARK	27/02/2023
A	ISSUED FOR COMMENT	24/02/2023

APPROVED

THE CSE GROUP. CONSULTING ENGINEERS
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E. engineers@thecsegroup.com.au
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DESIGNED: S Brodie
DRAWN: A Stevenson
SCALE: A1 1:500
DATE: Aug 2022

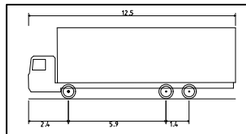
PROJECT TITLE: YEAR 9 CENTRE AND CARPARK
EMMANUEL COLLEGE
BOTANIC ROAD, WARNNAMBOOL

DRAWING TITLE: PROPOSED LAYOUT PLAN

NORTH

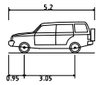
PROJECT No. 2022.152
SHEET C-54 REV. C

APPENDIX C – SWEPT PATH ASSESSMENT



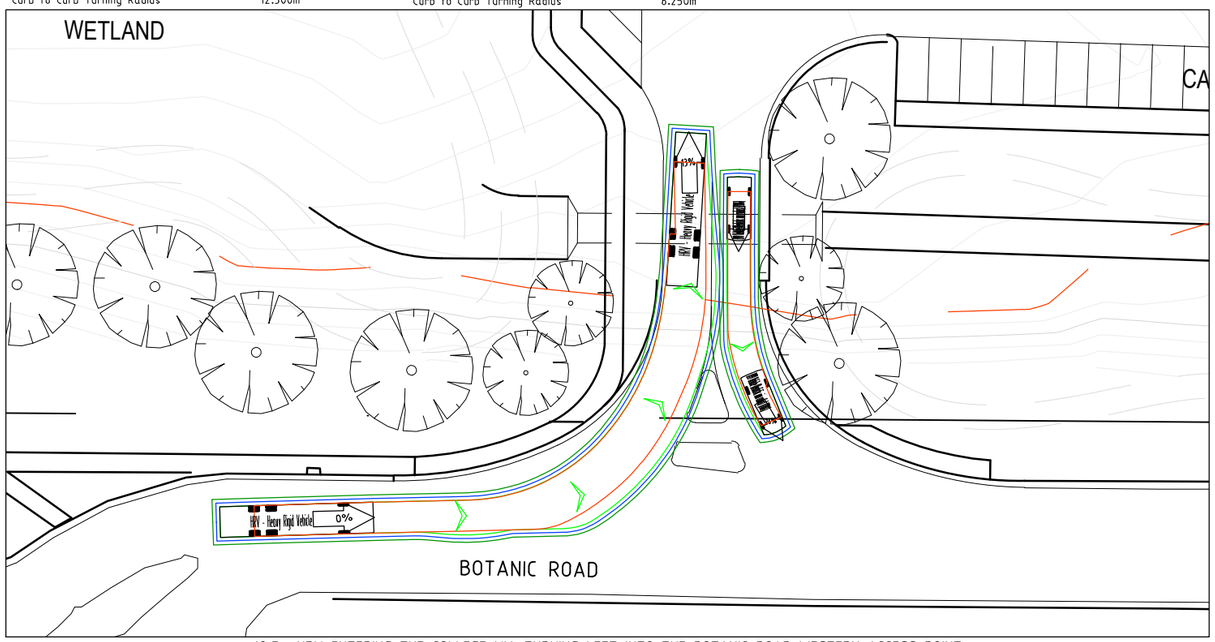
HRV - Heavy Rigid Vehicle

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

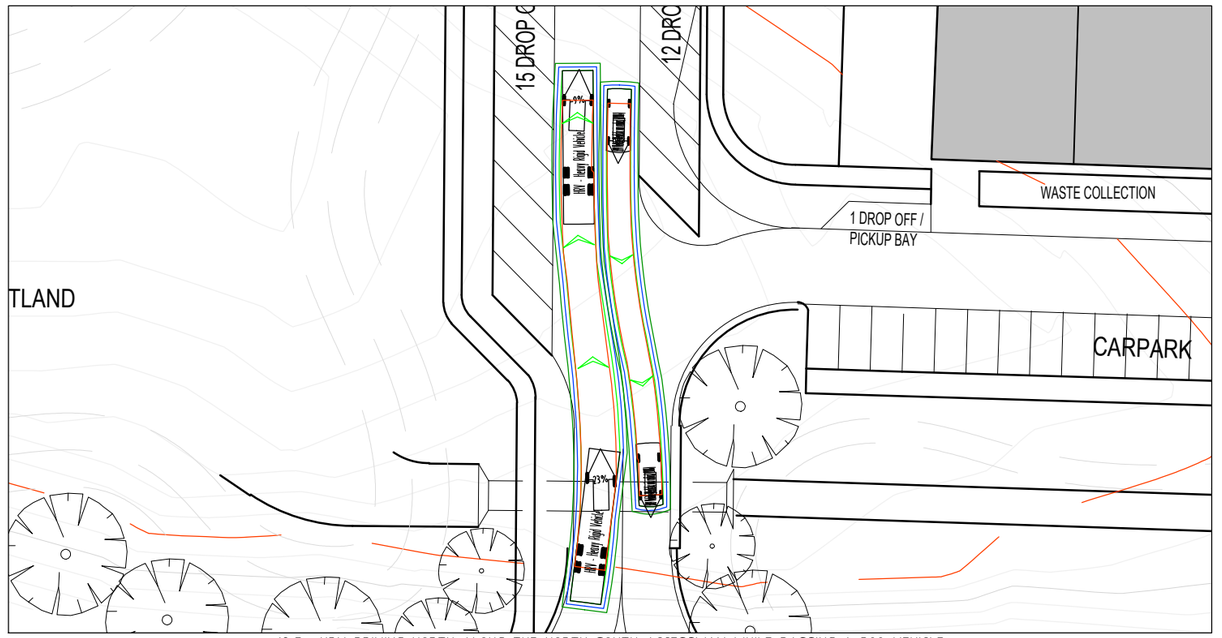


B99 Vehicle (Realistic min radius) (2004)

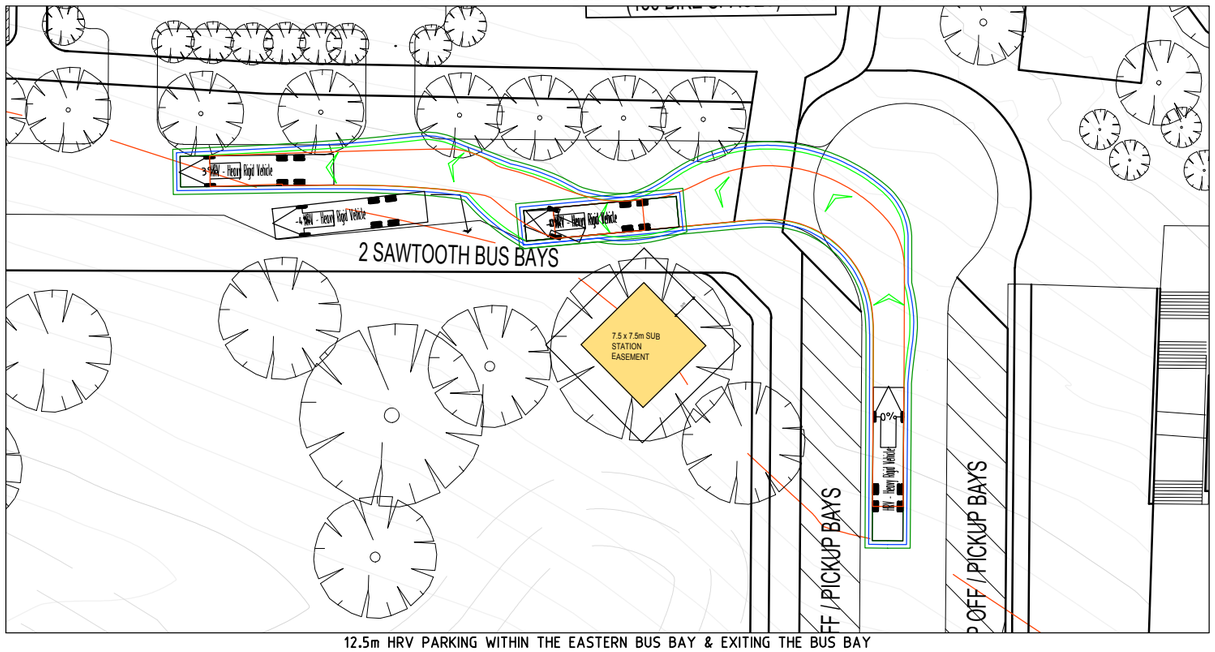
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m



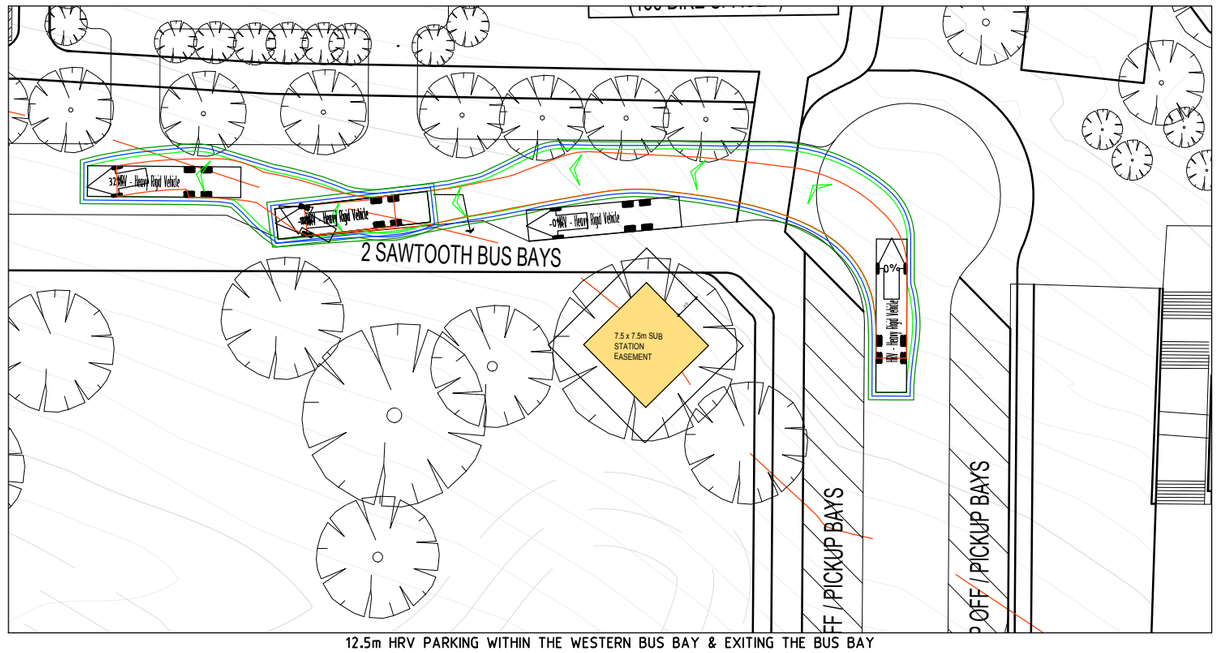
12.5m HRV ENTERING THE COLLEGE VIA TURNING LEFT INTO THE BOTANIC ROAD WESTERN ACCESS POINT



12.5m HRV DRIVING NORTH ALONG THE NORTH-SOUTH ACCESSWAY WHILE PASSING A B99 VEHICLE



12.5m HRV PARKING WITHIN THE EASTERN BUS BAY & EXITING THE BUS BAY



12.5m HRV PARKING WITHIN THE WESTERN BUS BAY & EXITING THE BUS BAY

No.	REVISION	DATE	DES/DFT	APPR'D
B	LAYOUT PLAN UPDATED.	22.05.24	T.D.	M.M.
A	LAYOUT PLAN UPDATED.	15.12.23	T.D.	M.M.

LEGEND

- WHEEL PATH (FORWARD)
- WHEEL PATH (REVERSE)
- BODY OUTLINE (FORWARD)
- BODY OUTLINE (REVERSE))
- 300mm BODY CLEARANCE (FORWARD)
- 300mm BODY CLEARANCE (REVERSE)
- 600mm BODY CLEARANCE (FORWARD)
- 600mm BODY CLEARANCE (REVERSE)

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Transport & Traffic Studies | Parking Studies | Traffic Management
Road Safety | Traffic Engineering | Civil Engineering

Drawn: T. Dinh
Designed: T. Dinh
Checked: M. Marsicovetere
Approved: M. Marsicovetere

Project: EMMANUEL COLLEGE, WARRNAMBOOL

Title: Swept Path Assessment - 1
12.5m Long HRV (Bus)
Entering, On-site Circulation & Parking

Client: Emmanuel College
140 Botanic Road
Warrnambool VIC 3280

Drawing No.: 22001EC-00-301
Revision: B
Drawing Status: Issued for Approval
Not to be used for construction
Sheet: 1 of 4
Date: 10.05.22
Scale: 1:500 (0 2.5 5 10)
Size: A3

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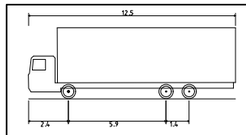
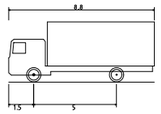


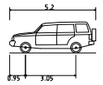
HRV - Heavy Rigid Vehicle

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m



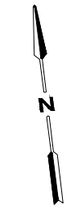
MRV - Medium Rigid Vehicle

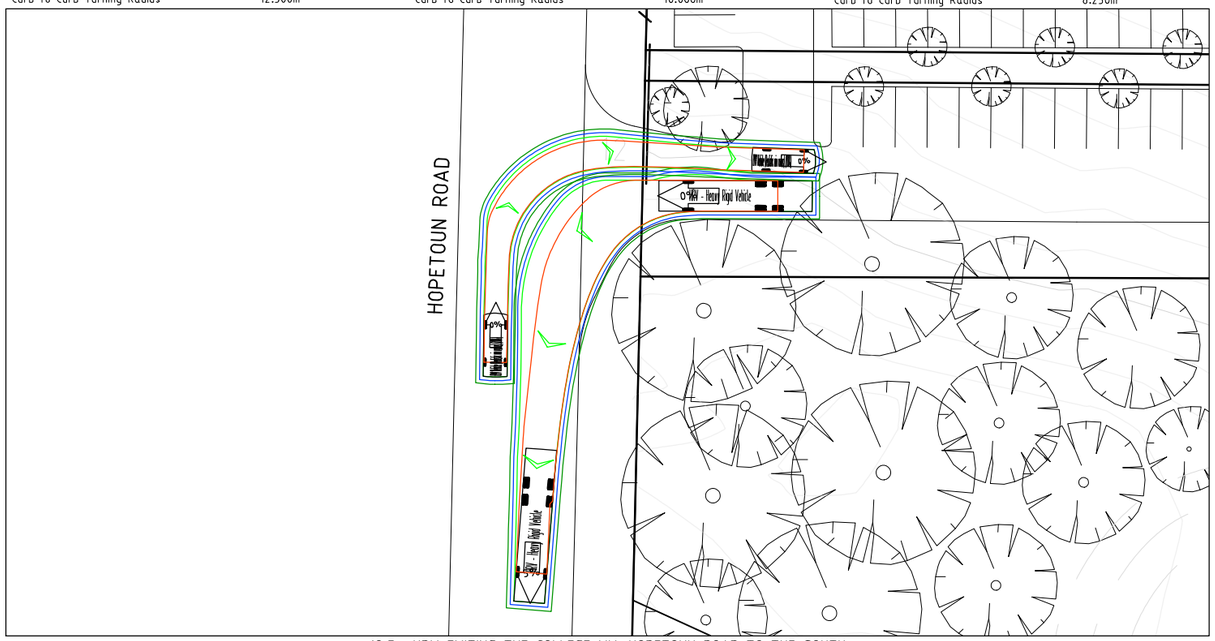
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



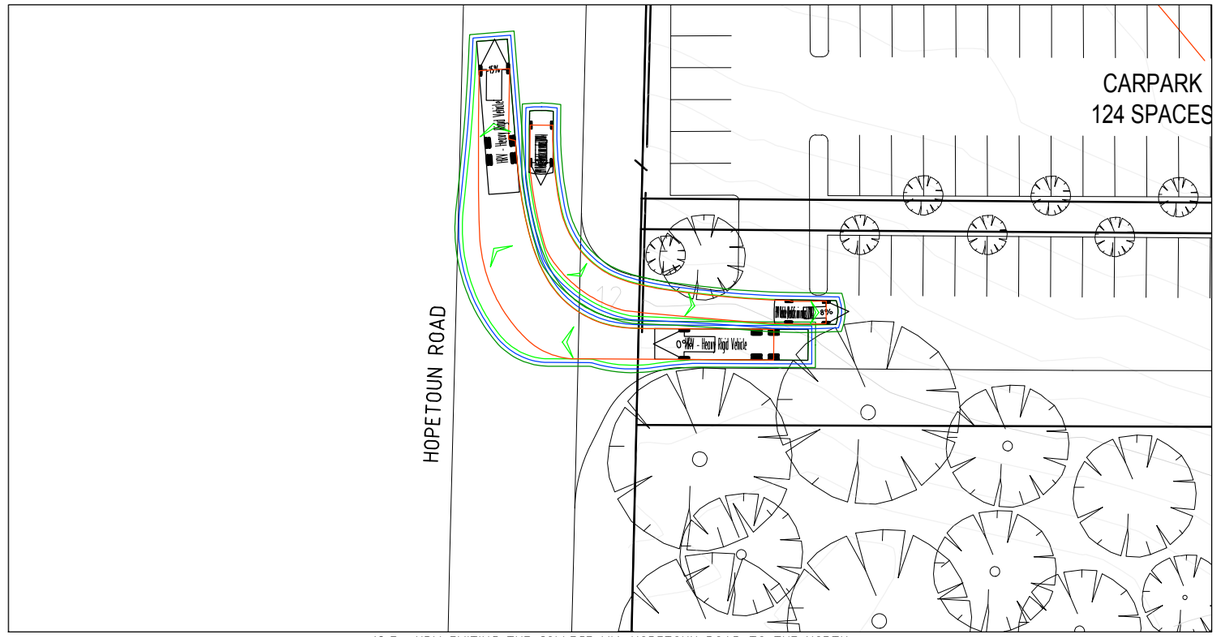
B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

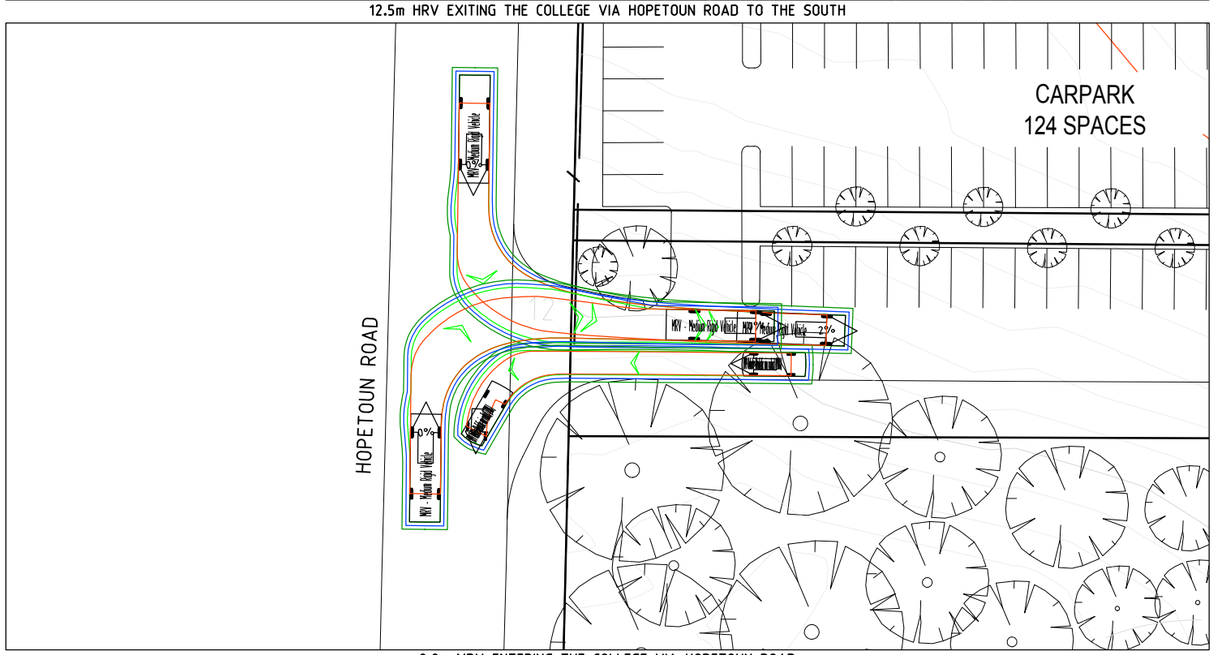




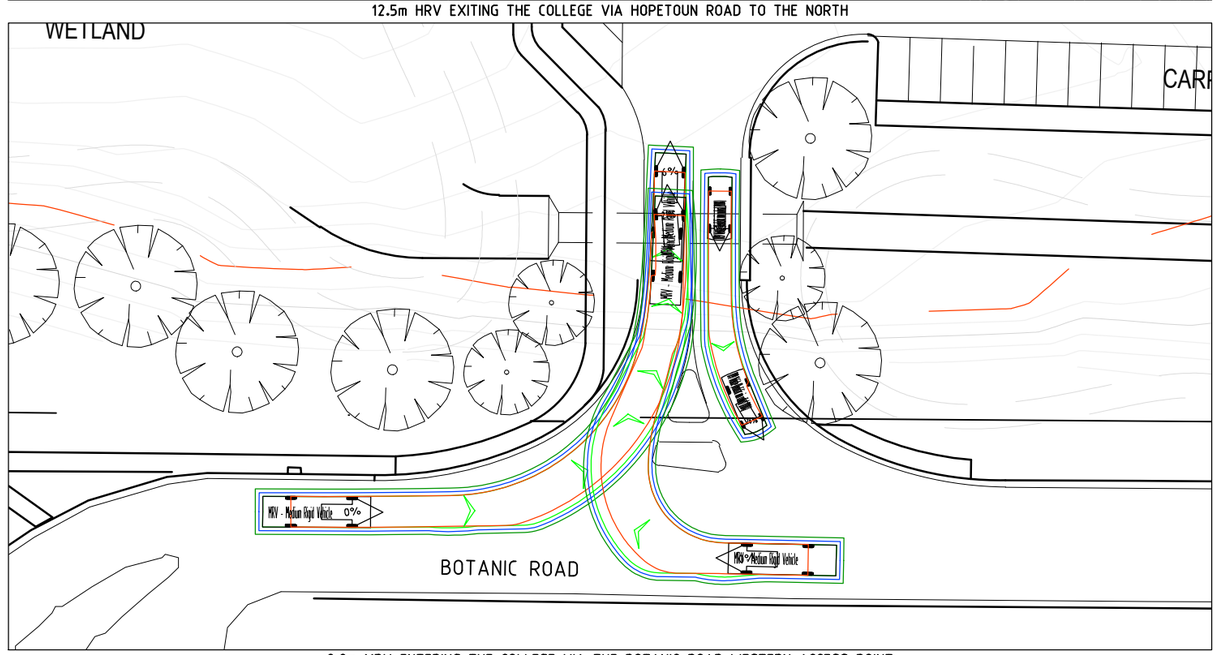
12.5m HRV EXITING THE COLLEGE VIA HOPETOUN ROAD TO THE SOUTH



12.5m HRV EXITING THE COLLEGE VIA HOPETOUN ROAD TO THE NORTH



8.8m MRV ENTERING THE COLLEGE VIA HOPETOUN ROAD



8.8m MRV ENTERING THE COLLEGE VIA THE BOTANIC ROAD WESTERN ACCESS POINT

No.	REVISION	DATE	DES/DFT	APPR'D
B	LAYOUT PLAN UPDATED.	22.05.24	T.D.	M.M.
A	LAYOUT PLAN UPDATED.	15.12.23	T.D.	M.M

LEGEND

- WHEEL PATH (FORWARD)
- WHEEL PATH (REVERSE)
- BODY OUTLINE (FORWARD)
- BODY OUTLINE (REVERSE))
- 300mm BODY CLEARANCE (FORWARD)
- 300mm BODY CLEARANCE (REVERSE)
- 600mm BODY CLEARANCE (FORWARD)
- 600mm BODY CLEARANCE (REVERSE)

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Road Safety | Traffic Engineering | Civil Engineering

Drawn	T. Dinh
Designed	T. Dinh
Checked	M. Marsicovetere
Approved	M. Marsicovetere

Project	EMMANUEL COLLEGE, WARRNAMBOOL
Title	Swept Path Assessment - 2 12.5m Long HRV & 8.8m Long MRV HRV Exiting & MRV Entering
Client	Emmanuel College 140 Botanic Road Warrnambool VIC 3280

Drawing No.	22001EC-00-302
Revision	B
Drawing Status	Issued for Approval Not to be used for construction
Sheet	2 of 4
Date	10.05.22
Scale	1:500 (0 2.5 5 10)
Size	A3

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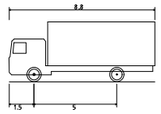
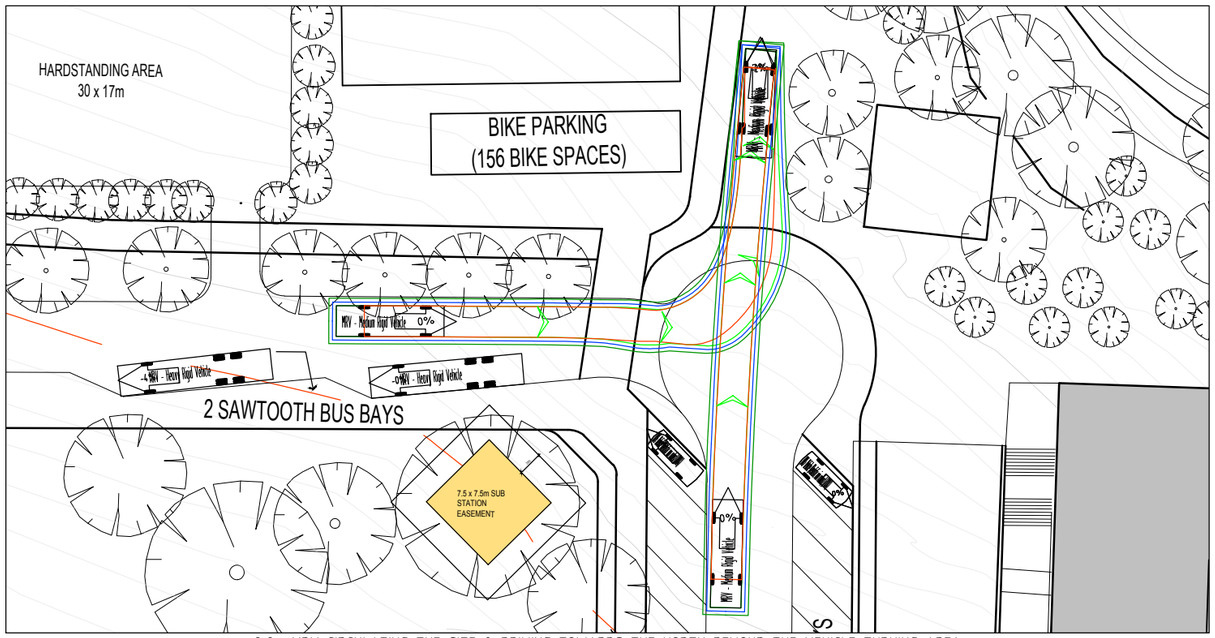
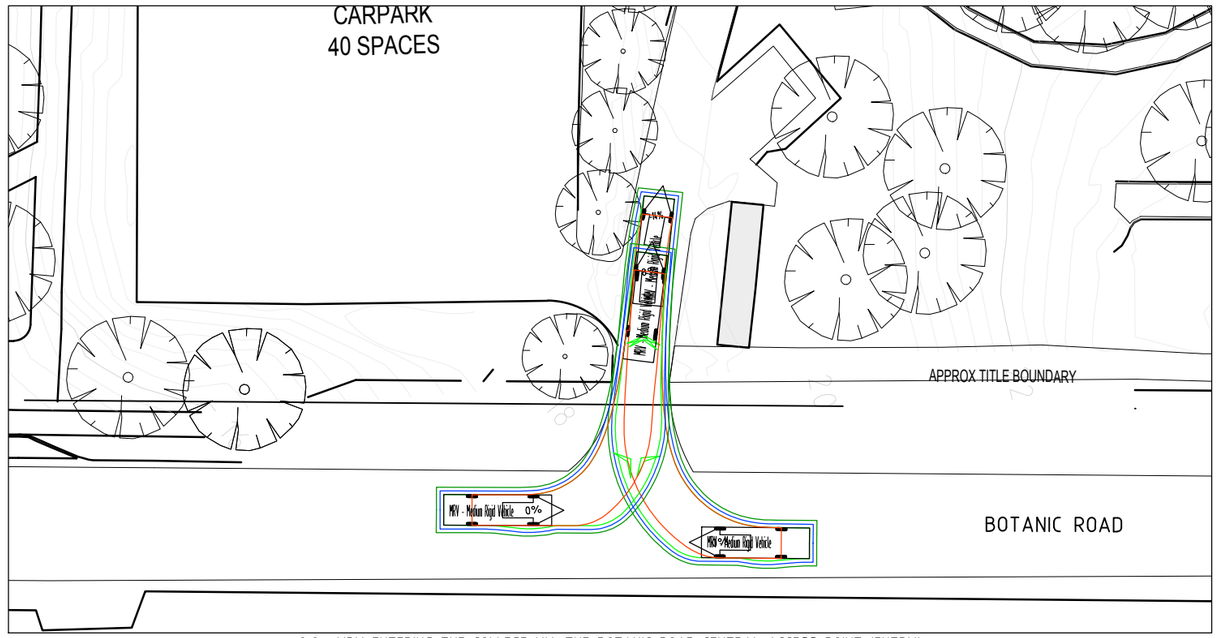


MRV - Medium Rigid Vehicle

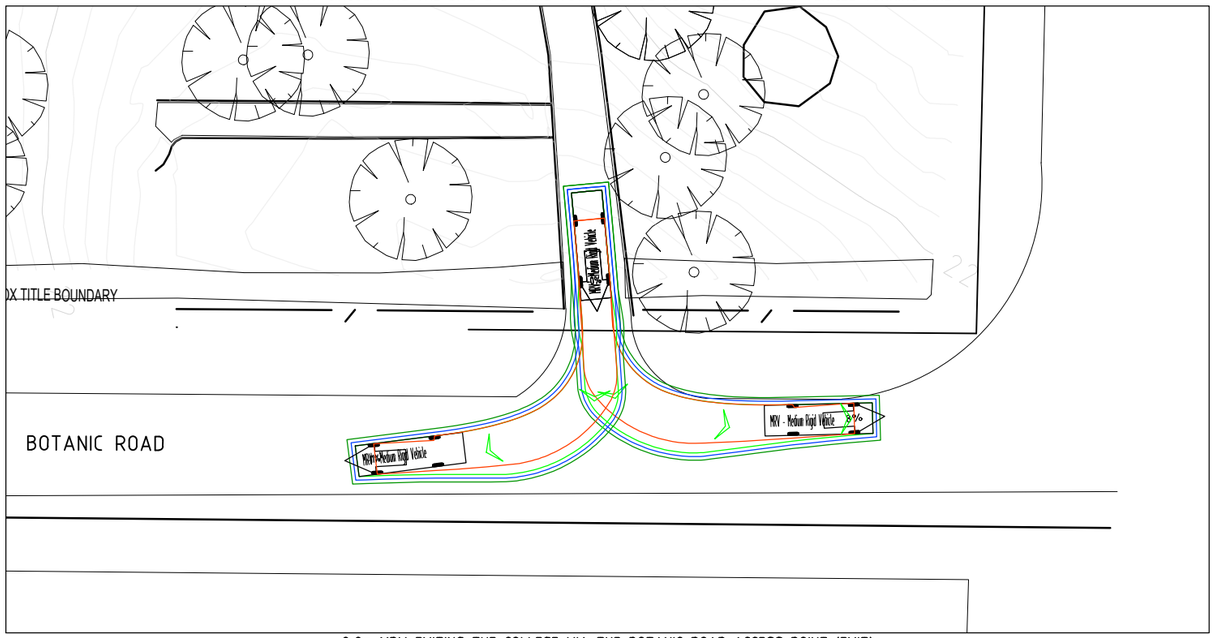
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



8.8m MRV CIRCULATING THE SITE & DRIVING TOWARDS THE NORTH BEYOND THE VEHICLE TURNING AREA



8.8m MRV ENTERING THE COLLEGE VIA THE BOTANIC ROAD CENTRAL ACCESS POINT (ENTRY)



8.8m MRV EXITING THE COLLEGE VIA THE BOTANIC ROAD ACCESS POINT (EXIT)

No.	REVISION	DATE	DES/DFT	APPR'D
B	LAYOUT PLAN UPDATED.	22.05.24	T.D.	M.M.
A	LAYOUT PLAN UPDATED.	15.12.23	T.D.	M.M.

LEGEND
- WHEEL PATH (FORWARD)
- WHEEL PATH (REVERSE)
- BODY OUTLINE (FORWARD)
- BODY OUTLINE (REVERSE))
- 300mm BODY CLEARANCE (FORWARD)
- 300mm BODY CLEARANCE (REVERSE)
- 600mm BODY CLEARANCE (FORWARD)
- 600mm BODY CLEARANCE (REVERSE)

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Road Safety | Traffic Engineering | Civil Engineering

Drawn: T. Dinh
Designed: T. Dinh
Checked: M. Marsicovetere
Approved: M. Marsicovetere

Project: EMMANUEL COLLEGE, WARRNAMBOOL

Title: Swept Path Assessment - 3
8.8m Long MRV - Entering & Exiting
On-site Circulation

Client: Emmanuel College
140 Botanic Road
Warrnambool VIC 3280

Drawing No.: 22001EC-00-303
Revision: B
Drawing Status: Issued for Approval
Not to be used for construction
Sheet: 3 of 4
Date: 10.05.22
Scale: 1:500 (0 2.5 5 10)
Size: A3

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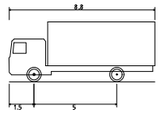
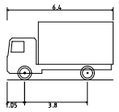


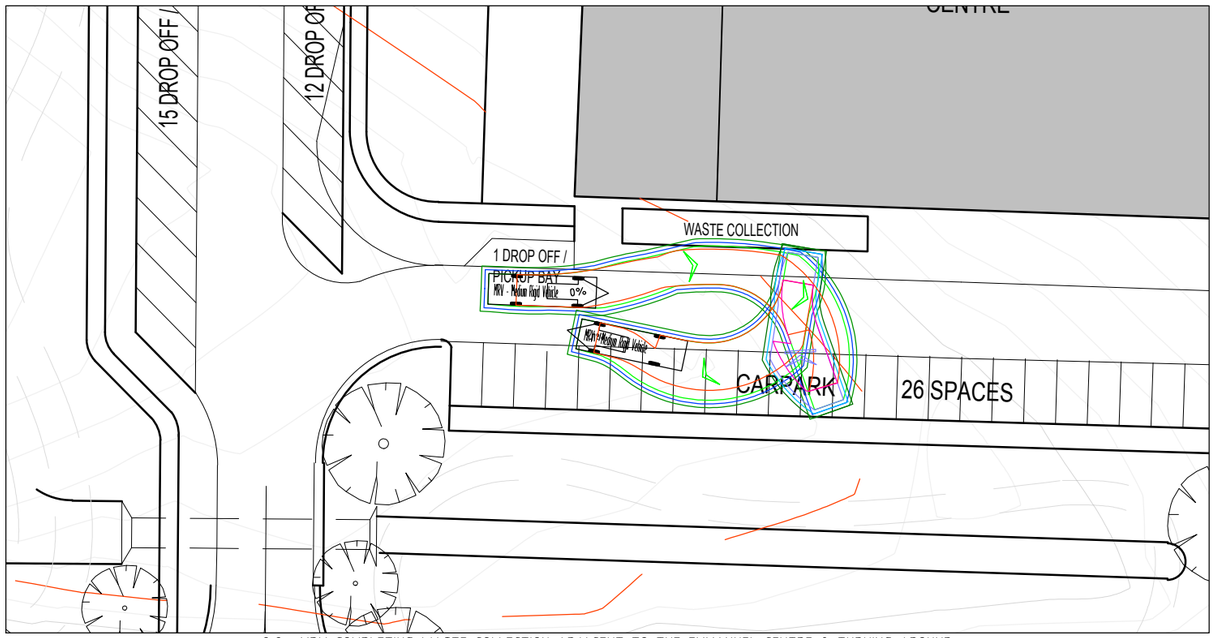
MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

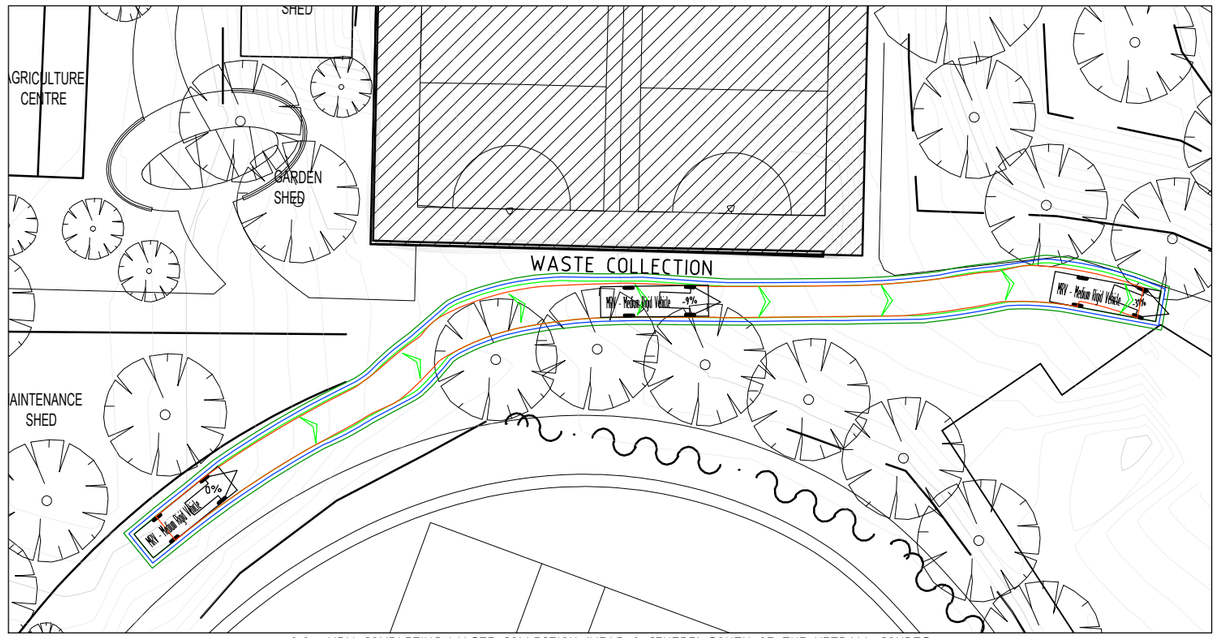


SRV - Small Rigid Vehicle

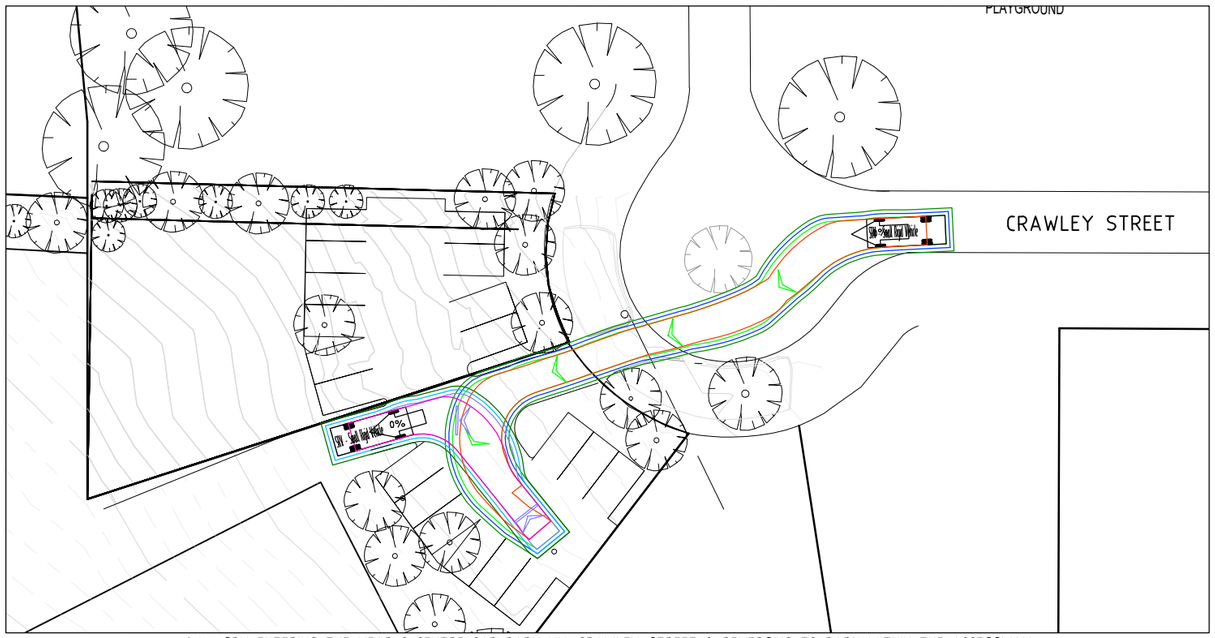
Overall Length	6.400m
Overall Width	2.330m
Overall Body Height	3.500m
Min Body Ground Clearance	0.398m
Track Width	2.330m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m



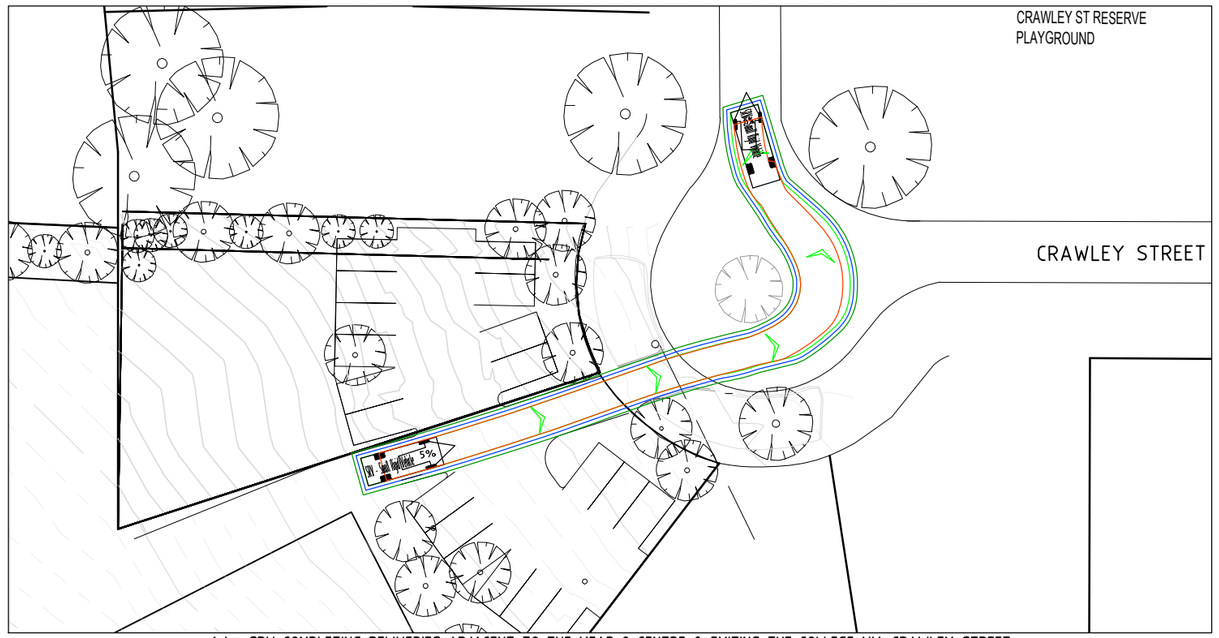
8.8m MRV COMPLETING WASTE COLLECTION ADJACENT TO THE EMMANUEL CENTRE & TURNING AROUND



8.8m MRV COMPLETING WASTE COLLECTION (YEAR 9 CENTRE) SOUTH OF THE NETBALL COURTS



6.4m SRV ENTERING THE YEAR 9 CENTRE CAR PARK VIA CRAWLEY STREET & REVERSING TO PARK WITHIN THE ACCESSWAY



6.4m SRV COMPLETING DELIVERIES ADJACENT TO THE YEAR 9 CENTRE & EXITING THE COLLEGE VIA CRAWLEY STREET

No.	REVISION	DATE	DES/DFT	APPR'D
B	LAYOUT PLAN UPDATED.	22.05.24	T.D.	M.M.
A	LAYOUT PLAN UPDATED.	15.12.23	T.D.	M.M.

LEGEND
- WHEEL PATH (FORWARD)
- WHEEL PATH (REVERSE)
- BODY OUTLINE (FORWARD)
- BODY OUTLINE (REVERSE))
- 300mm BODY CLEARANCE (FORWARD)
- 300mm BODY CLEARANCE (REVERSE)
- 600mm BODY CLEARANCE (FORWARD)
- 600mm BODY CLEARANCE (REVERSE)

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Road Safety | Traffic Engineering | Civil Engineering

Drawn: T. Dinh
Designed: T. Dinh
Checked: M. Marsicovetere
Approved: M. Marsicovetere

Project: EMMANUEL COLLEGE, WARRNAMBOOL

Title: Swept Path Assessment - 4
8.8m Long MRV Waste Collection
6.4m SRV Enter/Exit the Year 9 Centre & Deliveries

Client: Emmanuel College
140 Botanic Road
Warrnambool VIC 3280

Drawing No. 22001EC-00-304
Revision B
Drawing Status: Issued for Approval
Not to be used for construction
Sheet 4 of 4
Date 10.05.22
Scale 1:500 (0 2.5 5 10)
Size A3

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