

## Appendix F

# Traffic Impact Assessment

# ANNANDALE CHRISTIAN COLLEGE (PROPOSED NEW ADMINISTRATION BUILDING AND CAR PARK EXTENSION)



## TRAFFIC IMPACT ASSESSMENT

ANNANDALE CHRISTIAN COLLEGE

### LANGTREE CONSULTING

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|     |             |                                  |             |              |                |

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## APPENDICES

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APPENDIX B - SIDRA RESULTS SUMMARY

APPENDIX C – PROPOSED SIGNAGES AND PAVEMENT MARKING PLAN

## 1.0 INTRODUCTION

Langtree Consulting has been engaged by RPS Consulting on behalf of Annandale Christian College to undertake this Traffic Impact Assessment (TIA). This report has been prepared in support of a Development Application for Annandale Christian College situated at 104-156 Yolanda Drive, Annandale. The application pertains to land identified as Lot 2 on RP850718 and Lot 3 on SP256046, and the recently acquired property at 9 Jonquil Crescent, Annandale described as Lot 6 on RP747166.

The proposed development application seeks to increase enrolment and staffing numbers, demolition and reconstruct H Block (Heart & Hub), and extend the existing car park along the eastern boundary of the site.

This TIA report outlines the following:

- Background information for the project and proposed development;
- Existing traffic conditions, proposed development traffic generation and with development traffic conditions;
- Intersection analysis;
- Assessment of the development impacts including safety at the site accesses; and
- Any recommendations and mitigation measures, if required.

## 2.0 SITE

The proposed development is located approximately 7km from the Townsville CBD at:

- 104-156 Yolanda Drive, Annandale (Lot 2 on RP850718 and Lot 3 on SP256046); and
- 9 Jonquil Crescent, Annandale (Lot 6 on RP747166).

Lot 2 on RP850718, Lot 3 on SP256046 and Lot 6 on RP747166 is hereon in referred to as the subject site.

The subject site is 6.215ha in area and is bounded by Yolanda Drive to the south, Jonquil Crescent to the north, Cypress Drive to the northwest and neighbouring residential land on all other sides. Refer to **Figure 1** in red for site locality.



*Figure 1. Site Locality (Source: Queensland Globe)*

### 3.0 EXISTING ENVIRONMENTS

#### 3.1 LAND USE AND SURROUND AREA

The subject site is located within the Townsville City Council (TCC) area and is predominately zoned as community facilities with a portion zoned over the open drainage area zoned as environmental management to the south and east. Lot 6 on RP747166 (9 Jonquil Crescent, Annandale) is currently zoned low-density residential. Neighbouring lots are also zoned low density residential. Refer to **Figure 2** for TCC zoning map. As aforementioned, the subject site is currently utilised as an educational facility.



**Figure 2.** Zoning Map (Source: Townsville City Council City Plan Maps)

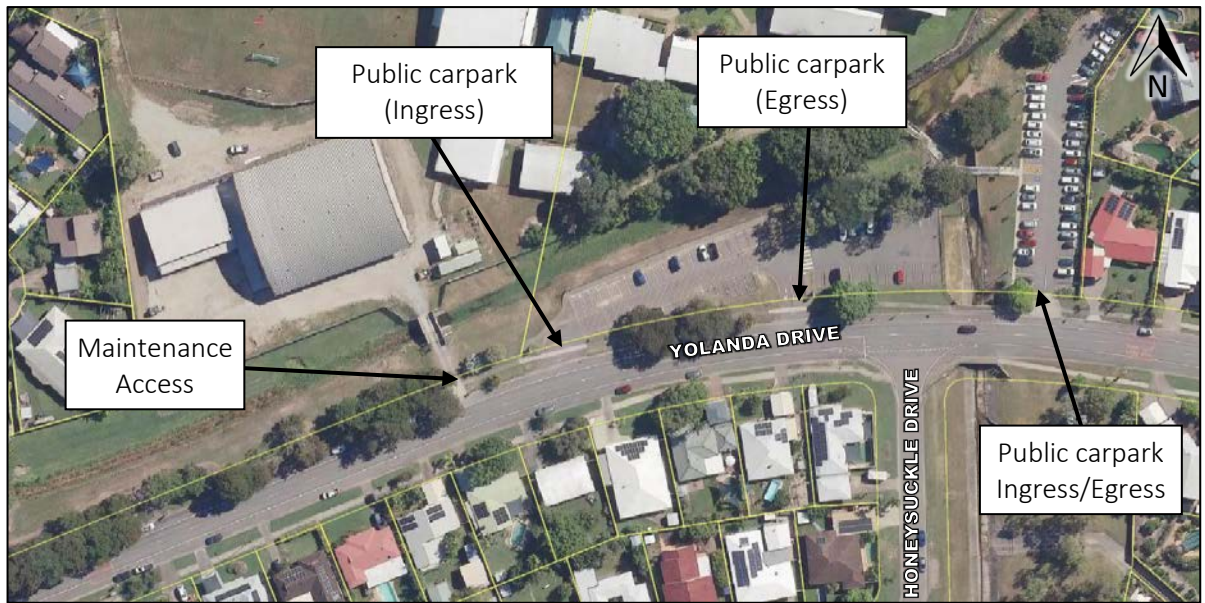
#### 3.2 SITE ACCESS

Currently the subject site has seven (7) accesses:

- Four (4) along Yolanda Drive:
  - Three (3) public carparking access points (ingress and egress);
  - One (1) site maintenance/bus access point; and
- Three (3) along Jonquil Crescent:
  - Four (4) staff carparking including one accessible parking space(ingress and egress); and
  - One (1) site maintenance access.

Refer to **Figures 3** and **4** for access localities.





**Figure 3.** Existing site accesses along Yolanda Drive (Source: Queensland Globe)



**Figure 4.** Existing site accesses along Jonquil Crescent (Source: Queensland Globe)



### 3.3 SURROUNDING ROAD NETWORK

The key surrounding roads in proximity of the subject site have been identified and summarised in **Table 1** below and are highlighted in yellow in **Figure 5**.

**Table 1.** Key Roads

| Road Name         | Jurisdiction | Hierarchy       | Speed limit                                 |
|-------------------|--------------|-----------------|---------------------------------------------|
| Yolanda Drive     | TCC          | Major Collector | 60km/h                                      |
| Oleander Street   | TCC          | Local Street    | Not posted<br>(50km/h built up residential) |
| Honeysuckle Drive | TCC          | Minor Collector | Not posted<br>(50km/h built up residential) |
| Cypress Drive     | TCC          | Minor Collector | Not posted<br>(50km/h built up residential) |
| Jonquil Crescent  | TCC          | Local Street    | Not posted<br>(50km/h built up residential) |



**Figure 5.** Key Roads (Source: Queensland Globe)

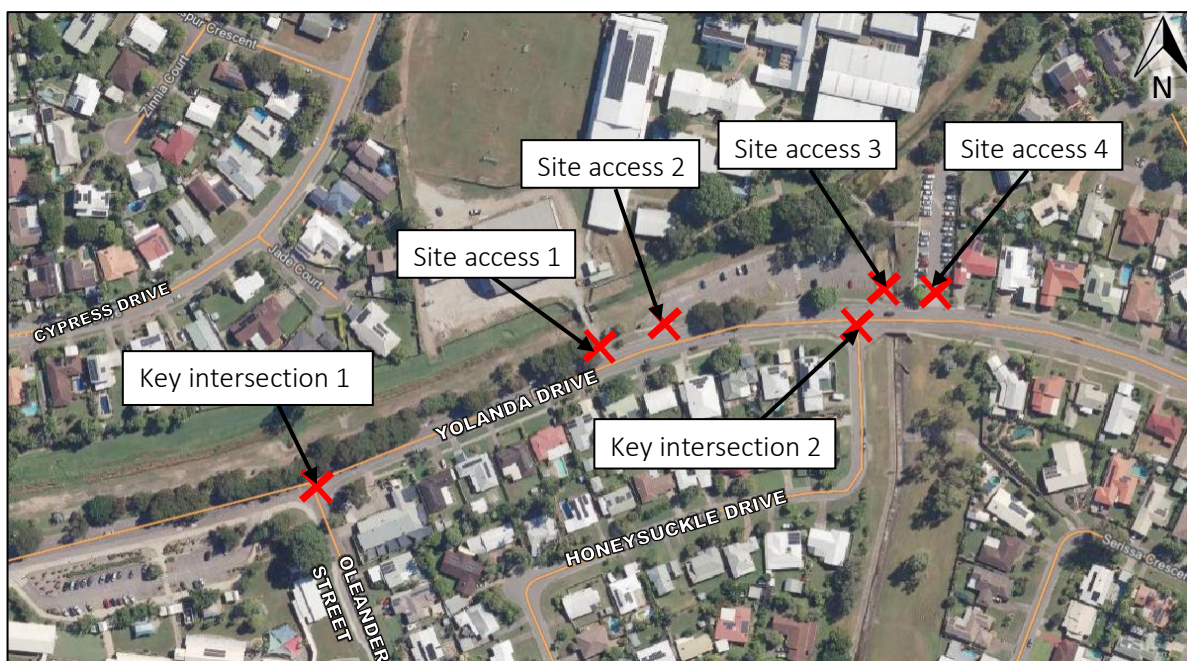


### 3.4 KEY INTERSECTIONS / ACCESSES

The key intersections and accesses are summarised below in **Table 2** and localities are shown in **Figures 6 and 7**.

**Table 2.** Key Intersections / Accesses

| ID                 | Roads                                                 | Control      |
|--------------------|-------------------------------------------------------|--------------|
| Site access 1      | Yolanda Drive / Maintenance access                    | Unsignalised |
| Site access 2      | Yolanda Drive / Public carpark 1 ingress              | Unsignalised |
| Site access 3      | Yolanda Drive / Public carpark 1 egress               | Unsignalised |
| Site access 4      | Yolanda Drive / Public carpark 2 access               | Unsignalised |
| Site access 5      | Jonquil Crescent/ Maintenance access                  | Unsignalised |
| Site access 6      | Jonquil Crescent/ Public carpark 3 access             | Unsignalised |
| Site access 7      | Jonquil Crescent/ Public carpark 4 access             | Unsignalised |
| Key intersection 1 | Yolanda Drive / Oleander Street                       | Unsignalised |
| Key intersection 2 | Yolanda Drive / Honeysuckle Drive                     | Unsignalised |
| Key intersection 3 | Cypress Drive/ Jonquil Crescent                       | Unsignalised |
| Key intersection 4 | Cypress Drive/ Jonquil Crescent                       | Unsignalised |
| Key intersection 5 | Jonquil Crescent / Jonquil Crescent (No Through Road) | Unsignalised |



**Figure 6.** Key intersections and accesses on Yolanda Drive (Source: Queensland Globe)



**Figure 7.** Key intersections and accesses on Cypress Drive and Jonquil Crescent (Source: Queensland Globe)

Please note that Site Access 7 was not included in the trip distribution assessment or the SIDRA operational analysis, as it experiences minimal traffic during the peak hour. However, sight lines and pedestrian considerations for this access point were assessed as part of the overall assessment.



### 3.5 CRASH HISTORY

Queensland Globe has been utilised to assess crash history in the vicinity of the school. All crash reports within 150m of the key intersections and site accesses are shown in **Figure 8** and summarised in **Table 3**. The majority of crashes are more than 10 years old and are generally not considered relevant. Three (3) crashes have occurred in the past 10 years; however, crash reports appear to be isolated incidents and are not associated with any particular road deficiency.



*Figure 8. Crash report localities (Source: Queensland Globe)*

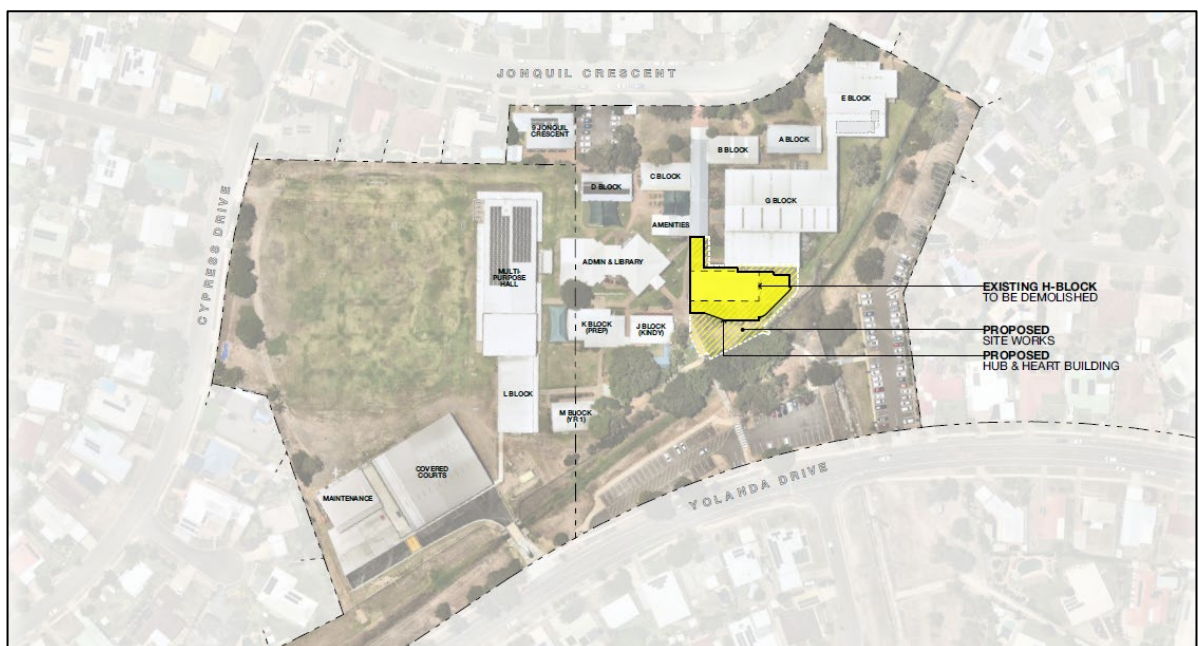


**Table 3.** Crash history report summary

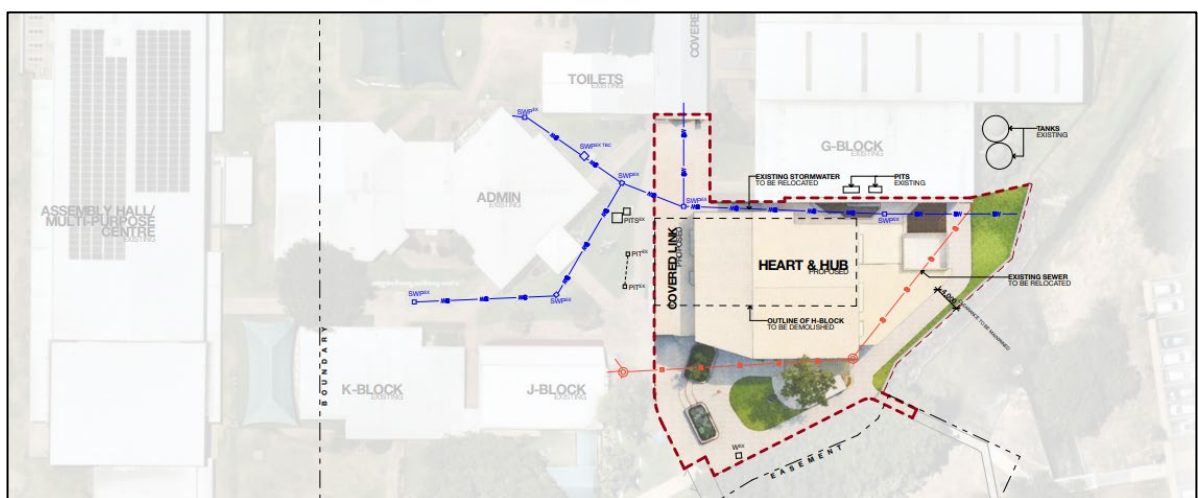
| Crash Location | Year | Severity          | Crash Type     | Crash Nature (DCA Code)  | Crash Description                                                                                              |
|----------------|------|-------------------|----------------|--------------------------|----------------------------------------------------------------------------------------------------------------|
| 1              | 2018 | Medical Treatment | Multi-Vehicle  | Rear end (303)           | Daylight, clear, sealed-dry, Straight, No Traffic control, Vehicle's Same Direction: Right Rear                |
| 2              | 2017 | Hospitalisation   | Multi-Vehicle  | Angle (104)              | Daylight, clear, sealed-dry, Straight, Intersection-T-Junction, Vehicle's Adjacent approach: Thru- Right       |
| 3              | 2006 | Property Damage   | Single Vehicle | Hit Parked Vehicle (200) | Darkness-Lighted, Raining, Sealed-Wet, Straight, No traffic Control, Vehicle's Opposite Approach: Other        |
| 4              | 2009 | Medical Treatment | Single Vehicle | Hit Parked Vehicle (703) | Darkness-Lighted, Clear, Sealed-Dry, Straight, no traffic Control, Off Path-Straight: Left off Cway Hit Object |
| 5              | 2005 | Hospitalisation   | Multi-Vehicle  | Angle (408)              | Daylight, clear, sealed-dry, Straight, No Traffic Control, Vehicle's Manoeuvring: Entering from Footway        |
| 6              | 2002 | Hospitalisation   | Multi-Vehicle  | Rear-end (303)           | Daylight, clear, sealed-dry, Curve-view open, No Traffic Control, Vehicle's Same Direction: Right Rear         |
| 7              | 2003 | Hospitalisation   | Single Vehicle | Hit Parked Vehicle (601) | Darkness-Lighted, Clear, Sealed-Dry, Straight, No traffic Control, Vehicle on Path: Parked                     |
| 8              | 2007 | Medical Treatment | Hit Pedestrian | Hit Pedestrian (3)       | Daylight, clear, sealed-dry, Straight, No Traffic Control: Pedestrian Far side vehicle Hit from left           |
| 9              | 2001 | Minor Injury      | Multi-Vehicle  | Angle (308)              | Daylight, clear, sealed-dry, Straight, No Traffic Control: Vehicle same direction: Right turn/ Swipe           |
| 10             | 2011 | Hospitalisation   | Multi-Vehicle  | Head-on (201)            | Daylight, clear, sealed-dry, Straight, No Traffic Control: Vehicle opposite approach: Head on                  |
| 11             | 2010 | Minor Injury      | Multi-Vehicle  | Angle (104)              | Daylight, clear, sealed-dry, Curved-view open, No Traffic Control: Vehicle Adjacent Approach: Thru Right       |
| 12             | 2018 | Minor Injury      | Single Vehicle | Hit parked vehicle (406) | Daylight, clear, sealed-dry, Straight, No Traffic Control: Vehicle Manoeuvring: Leaving Driveway               |

## 4.0 PROPOSED DEVELOPMENT

The proposed development includes the demolition H Block (OSHC and classrooms) and is to be replaced with a new two storey administration building (also referred to as Hub and Heart Building). In addition, a car park extension located on the eastern boundary of the subject site is proposed. The recently acquired land located at 9 Jonquil Crescent (Lot 6 on RP747166) is approved to be utilised as office space and will be utilised as a temporary administration office during the demolition of H Block and construction of the proposed Hub & Heart Building. Refer to **Figures 9** and **10** for the proposed new administration building locality plan, and **Figure 11** for the proposed car parking extension. The proposed development plans are attached to **Appendix A**.



*Figure 9. Existing and Proposed Development Locality (Source: Burling Brown)*



*Figure 10. Proposed Development Layout Plan (Source: Burling Brown)*





## 5.0 BACKGROUND TRAFFIC

A traffic count has been conducted at all key Intersection and site accesses as part of this assessment. The traffic count was conducted on 16 July 2024. The AM peak was found to occur from 7:45am to 8:45pm and 2:30pm to 3:30pm for the PM peak. The background traffic data along Yolanda drive has been summarised in **Table 4** with the corresponding movements number shown in **Figure 12**, while background traffic data along Jonquil crescent is summarised in **Table 5** with the corresponding movement number shown in **Figure 13**.



**Figure 12.** Background Traffic Data Movement Numbers along Yolanda Drive

**Table 4.** Background traffic data- Along Yolanda Drive

| Key Intersection/<br>Site Access | Direction  | Count<br>year | Movement<br>No. | Description                                  | AM<br>Peak | PM<br>Peak | ADT |
|----------------------------------|------------|---------------|-----------------|----------------------------------------------|------------|------------|-----|
| Key Intersection<br>1            | Westbound  | 2024          | 7               | Left Turn Out onto<br>Yolanda Drive          | 72         | 56         | 128 |
|                                  | Eastbound  | 2024          | 8               | Right Turn Out onto<br>Yolanda Drive         | 31         | 21         | 52  |
|                                  | Southbound | 2024          | 9               | Through Oleander Street                      | 135        | 80         | 215 |
| East of Key<br>Intersection 1    | Westbound  | 2024          | 11              | Between Yolanda Drive<br>and Oleander Street | 517        | 342        | 859 |
|                                  | Eastbound  | 2024          | 10              | Between Yolanda Drive<br>and Oleander Street | 362        | 259        | 621 |
| Site Access 2<br>(Ingress)       | Northbound | 2024          | 22              | Entering Site Access 2<br>Ingress            | 139        | 104        | 243 |

**Table 4.** Background traffic data- Along Yolanda Drive (continued)

| Key Intersection/<br>Site Access | Direction  | Count<br>year | Movement<br>No. | Description                                     | AM<br>Peak | PM<br>Peak | ADT |
|----------------------------------|------------|---------------|-----------------|-------------------------------------------------|------------|------------|-----|
| Site Access 3<br>(Egress)        | Westbound  | 2024          | 23              | Right Turn Out onto<br>Yolanda Drive            | 84         | 62         | 146 |
|                                  | Eastbound  | 2024          | 24              | Left Turn Out onto<br>Yolanda Drive             | 55         | 41         | 96  |
| Key Intersection<br>2            | Southbound | 2024          | 12              | Right Turn in onto Honey<br>Suckle Drive        | 7          | 0          | 7   |
|                                  | Southbound | 2024          | 18              | Left Turn In onto<br>Honeysuckle Drive          | 9          | 1          | 10  |
|                                  | Westbound  | 2024          | 17              | Left Turn Out onto<br>Yolanda Drive             | 12         | 1          | 13  |
|                                  | Eastbound  | 2024          | 13              | Right Turn Out onto<br>Yolanda Drive            | 10         | 0          | 10  |
| Site Access 4                    | Westbound  | 2024          | 20              | Right Turn Out onto<br>Yolanda Drive            | 4          | 12         | 16  |
|                                  | Eastbound  | 2024          | 21              | Left Turn Out onto<br>Yolanda Drive             | 14         | 30         | 44  |
|                                  | Northbound | 2024          | 14              | Left Turn In onto Site<br>Access 4              | 18         | 6          | 24  |
|                                  | Northbound | 2024          | 15              | Right Turn In onto Site<br>Access 4             | 34         | 15         | 49  |
| East of Site<br>Access 4         | Westbound  | 2024          | 19              | Between Yolanda Drive<br>and Honey Suckle Drive | 533        | 310        | 843 |
|                                  | Eastbound  | 2024          | 16              | Between Yolanda Drive<br>and Honey Suckle Drive | 335        | 259        | 594 |



**Figure 13.** Background Traffic Data Movement Numbers along Cypress Drive and Jonquil Crescent.

**Table 5.** Background traffic data- Along Cypress Drive and Jonquil Crescent

| Key Intersection/<br>Site Access | Direction  | Count<br>year | Movement<br>No. | Description                          | AM<br>Peak | PM<br>Peak | ADT |
|----------------------------------|------------|---------------|-----------------|--------------------------------------|------------|------------|-----|
| Key Intersection<br>3            | Northbound | 2024          | 1               | Through Cypress Road                 | 78         | 102        | 180 |
|                                  | Eastbound  | 2024          | 2               | Right turn In onto Jonquil Crescent  | 10         | 12         | 22  |
|                                  | Southbound | 2024          | 3               | Left Turn Out onto Cypress Drive     | 58         | 45         | 103 |
|                                  | Northbound | 2024          | 4               | Right Turn Out onto Cypress Drive    | 46         | 26         | 72  |
|                                  | Southbound | 2024          | 5               | Through Cypress Road                 | 114        | 68         | 182 |
|                                  | Eastbound  | 2024          | 6               | Left Turn In onto Jonquil Crescent   | 25         | 10         | 35  |
| Key Intersection<br>5            | Southbound | 2024          | 25              | Right Turn In onto Jonquil Crescent  | 88         | 47         | 135 |
|                                  | Southbound | 2024          | 27              | Left Tun In onto Jonquil Crescent    | 1          | 1          | 2   |
|                                  | Westbound  | 2024          | 28              | Left Turn out onto Jonquil Crescent  | 6          | 9          | 15  |
|                                  | Eastbound  | 2024          | 26              | Right Turn out onto Jonquil Crescent | 1          | 1          | 2   |



It is noted that when the counts were assessed, there is a discrepancy between the through movement count between movements 10 and 11, and movements 16 and 19. These discrepancies were believed to be associated with the vehicle that park on street between the count locations. It is noted that an existing day care facility is located on the southeastern corner of Key intersection 1 (Oleander Street/ Yolanda Drive). The facility has a one-way arrangement and staff members likely associated appear to utilise the immediate area fronting the site for on street parking.

## 5.1 BACKGROUND TRIP DISTRIBUTION

At the time of the traffic count seven hundred (700) students were enrolled at the school with eighty-seven (87) full-time equivalent (FTE) staff members employed. It is understood that the school currently has seven hundred and thirty (730) enrolled and 94 full-time equivalent staff members. By 2032 it is projected that seven hundred and seventy (770) students will be enrolled with ninety-eight (98) FTE staff members. Based on the growth seen, for the purpose of this TIA, this report evaluates the impact should the full seven hundred and seventy (770) students and ninety-eight (98) FTE staff utilising the site. The adopted base year for assessment is 2027. The 10-years horizon is 2037.

### 5.1.1 Growth

To identify the growth to be adopted, the TCC 2025 traffic calibration model and 2026 traffic forecast model along the relevant segments of Yolanda Drive have been reviewed. Refer to **Table 6** for a summary of the TCC 2025 traffic calibration and 2026 traffic forecast models.

Based on **Table 6**, the projected AADT traffic growth between the TCC 2025 traffic calibration and 2026 traffic forecast models and was found to be from 0.76% to 2.7%. However, the peak hour growth is reported to experience negative growth. To be conservative **1%** growth during the peak hour has been adopted for this assessment.

**Table 6.** Traffic Data (Source. TCC 2025 Calibration and 2026 Forecast Model)

| Description                                              | Direction | 2025        |              |              | 2026        |              |              | %Growth |        |        |
|----------------------------------------------------------|-----------|-------------|--------------|--------------|-------------|--------------|--------------|---------|--------|--------|
|                                                          |           | AADT, veh/d | AM PH, veh/h | PM PH, veh/h | AADT, veh/d | AM PH, veh/h | PM PH, veh/h | AADT    | AM     | PM     |
| Between Camella Court and Cypress Drive                  | Eastbound | 1515        | 186          | 231          | 1543        | 174          | 107          | 1.85%   | -6.5%  | -53.7% |
|                                                          | Westbound | 2374        | 401          | 251          | 2392        | 346          | 215          | 0.76%   | -13.7% | -14.3% |
| Between Cypress Drive and Annandale State School ingress | Eastbound | 969         | 155          | 12           | 992         | 148          | 37           | 2.37%   | -4.5%  | 208.3% |
|                                                          | Westbound | 1645        | 249          | 213          | 1672        | 201          | 186          | 1.64%   | -19.3% | -12.7% |
| West of Key Intersection 1                               | Eastbound | 558         | 61           | 102          | 573         | 53           | 18           | 2.69%   | -13.1% | -82.4% |
|                                                          | Westbound | 1607        | 224          | 157          | 1628        | 175          | 127          | 1.31%   | -21.9% | -19.1% |
| East of Key Intersection 1                               | Eastbound | 556         | 59           | 90           | 571         | 53           | 17           | 2.70%   | -10.2% | -81.1% |
|                                                          | Westbound | 1498        | 199          | 152          | 1518        | 151          | 122          | 1.34%   | -24.1% | -19.7% |

### 5.1.2 Heavy vehicle percentage

The traffic count that was conducted does not include the count for the heavy vehicles. The heavy vehicle percentage from the TCC 2025 traffic calibration model has been adopted for this assessment.

### 5.1.3 Other assumptions

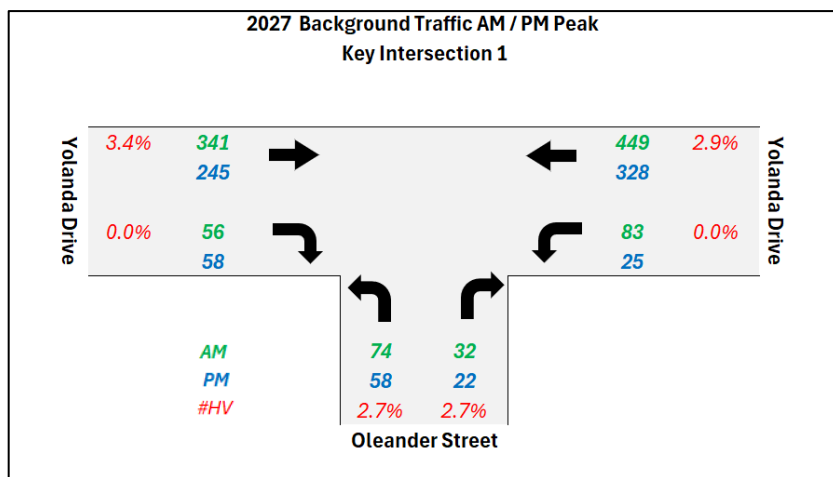
As aforementioned, a discrepancy was observed in the through movement counts between movements 10 and 11, and movements 16 and 19. This variation is believed to be influenced by vehicles parking along Yolanda Drive between the Key intersection 1 (Oleander Street/Yolanda Drive) and Site Access 4, as well as activity associated with the existing daycare facility located in the southeastern corner of the Key intersection 1. To address this discrepancy and ensure that traffic volumes at the intersections reflect the most representative conditions:

- Key Intersection 1 volumes were determined using the traffic counts from movements 10 and 11; and
- For the through movements between Site Access 4 and Site Access 1, traffic counts have been derived from counts from movements 16 and 19.

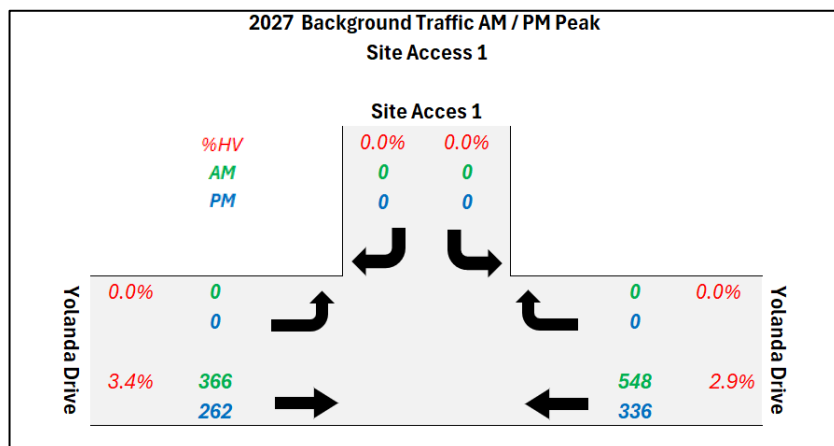
The differences between these two sets of traffic counts are assumed to result from the localised parking and daycare-related traffic activities.

## 5.2 BACKGROUND TRIP DISTRIBUTION

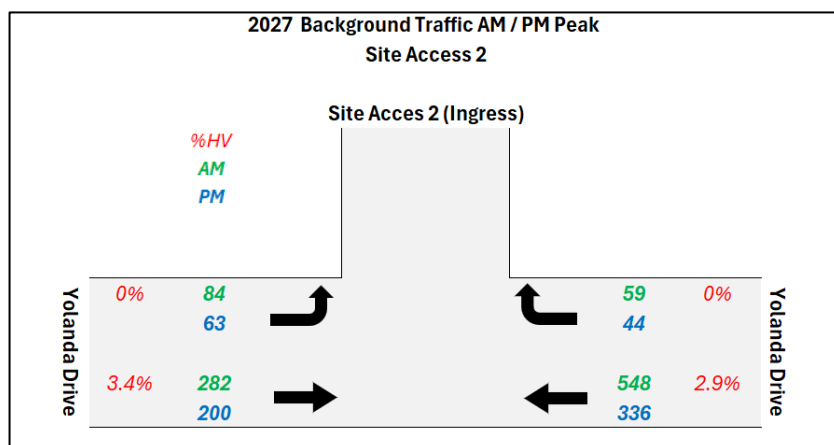
The 2027 background traffic and distributions are summarised in **Figures 14 to 24** and the 2037 background traffic and distributions are summarised in **Figures 25 to 35**.



**Figure 14.** 2027 Background traffic AM and PM peak hour traffic distribution - Key intersection 1

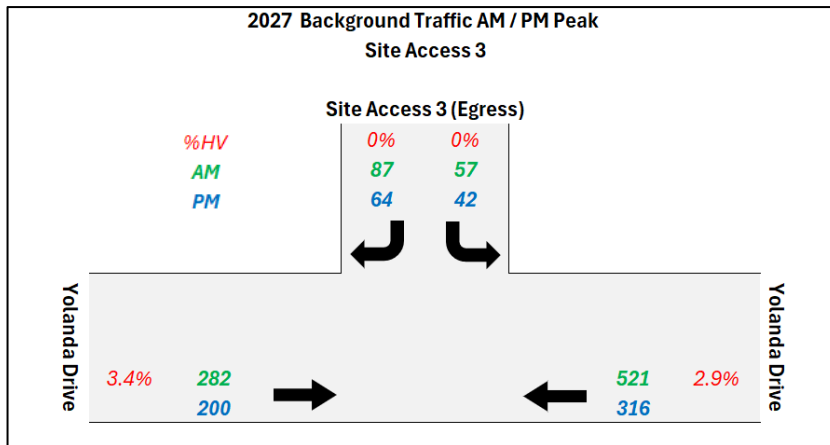


**Figure 15.** 2027 Background traffic AM and PM peak hour traffic distribution – Site access 1

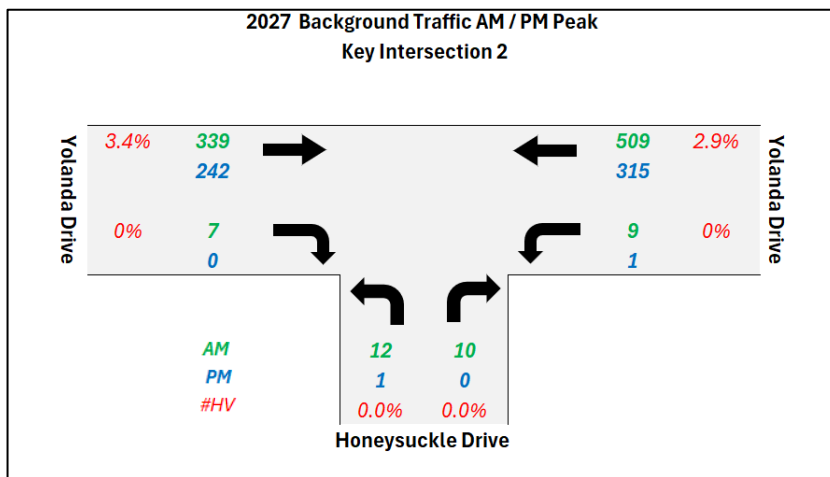


**Figure 16.** 2027 Background traffic AM and PM peak hour traffic distribution – Site Access 2

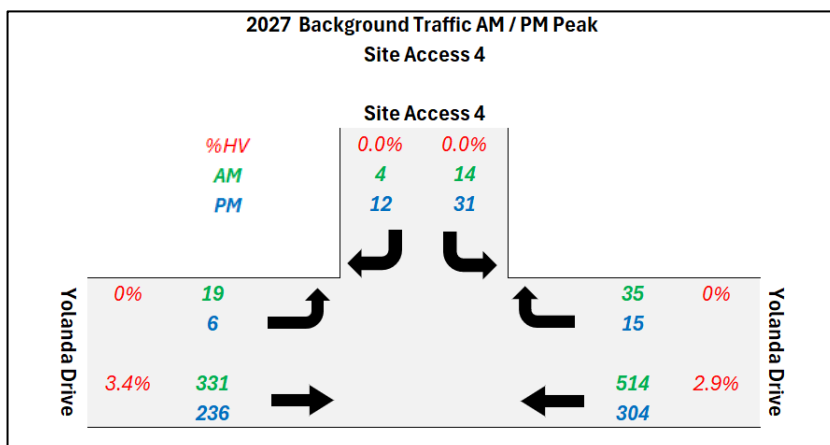




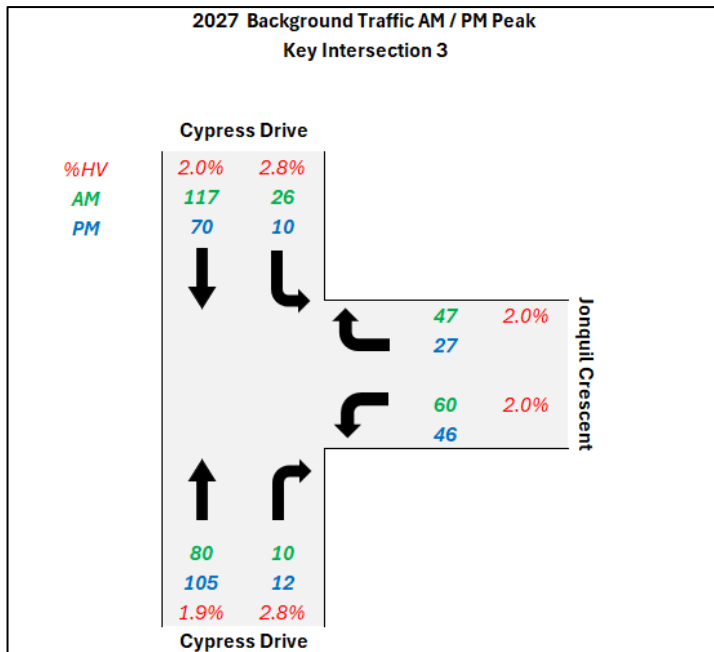
**Figure 17.** 2027 Background traffic AM and PM peak hour traffic distribution – Site access 3



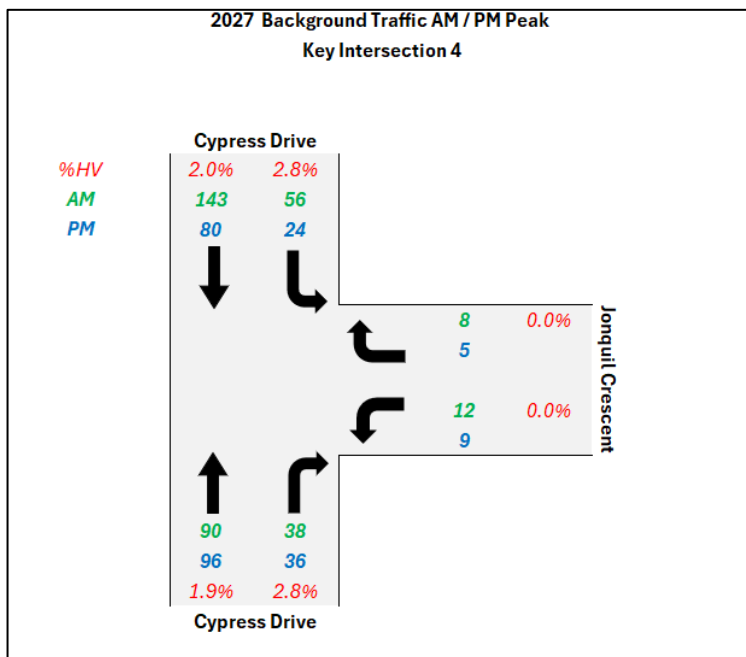
**Figure 18.** 2027 Background traffic AM and PM peak hour traffic distribution – Key intersection 2



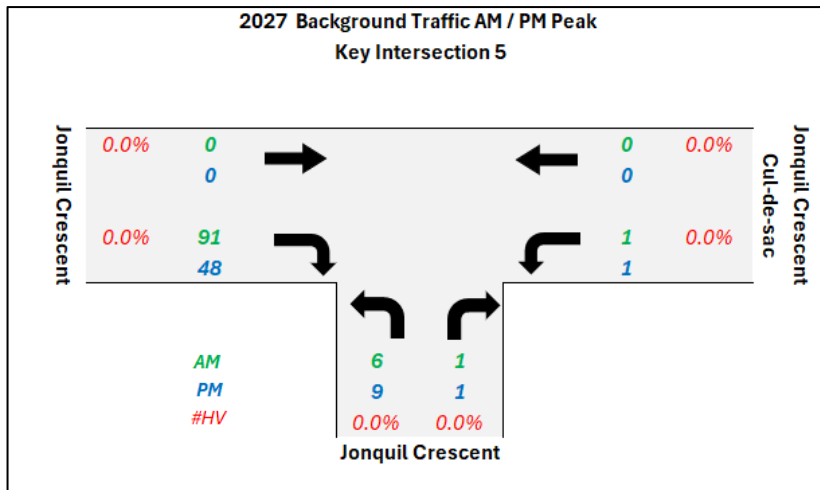
**Figure 19.** 2027 Background traffic AM and PM peak hour traffic distribution – Site access 4



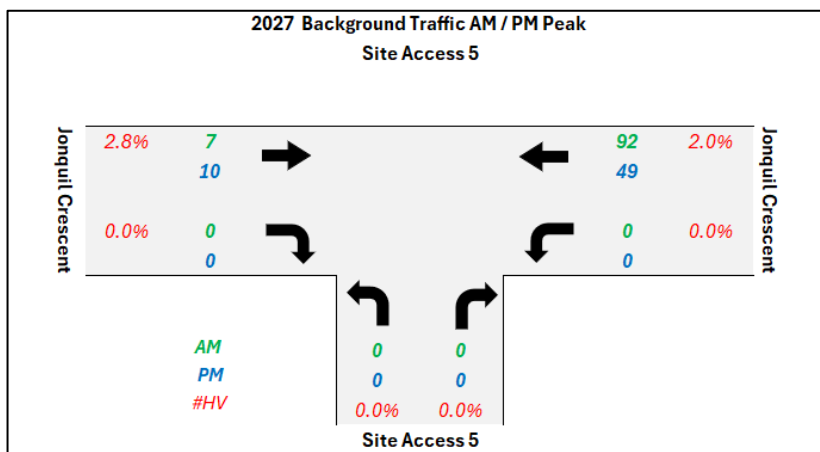
**Figure 20.** 2027 Background traffic AM and PM peak hour traffic distribution – Key intersection 3



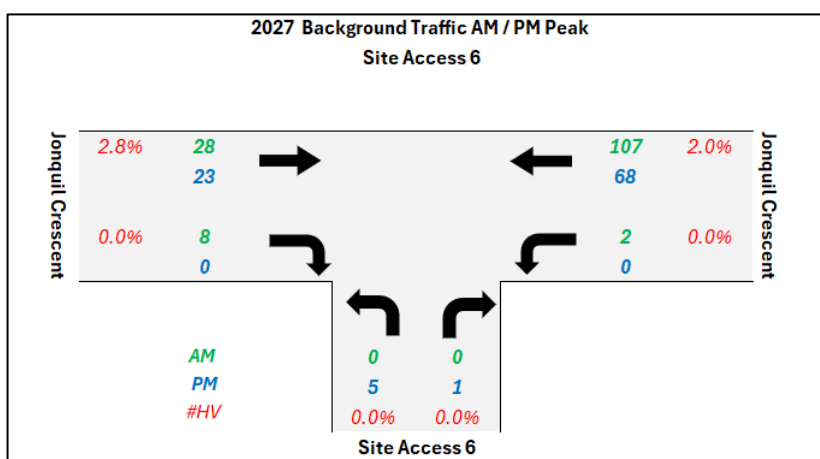
**Figure 21.** 2027 Background traffic AM and PM peak hour traffic distribution – Key intersection 4



**Figure 22.** 2027 Background traffic AM and PM peak hour traffic distribution – Key intersection 5



**Figure 23.** 2027 Background traffic AM and PM peak hour traffic distribution – Site access 5



**Figure 24.** 2027 Background traffic AM and PM peak hour traffic distribution – Site access 6



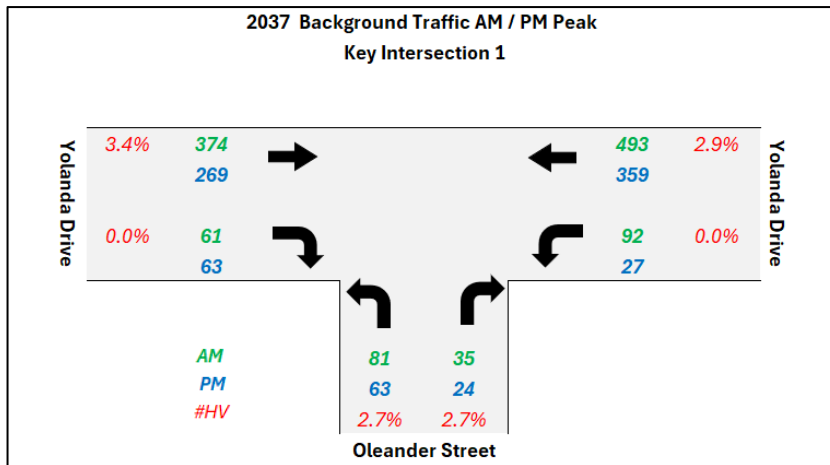


Figure 25. 2037 Background traffic AM and PM peak hour traffic distribution – Key intersection 1

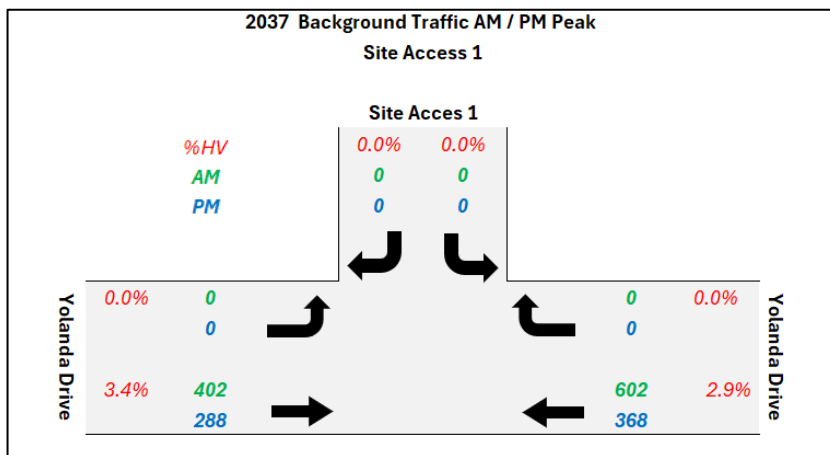


Figure 26. 2037 Background traffic AM and PM peak hour traffic distribution – Site access 1

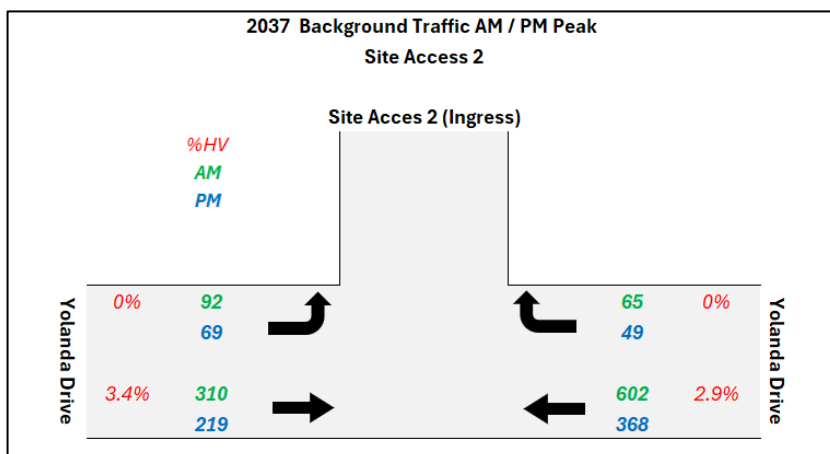


Figure 27. 2037 Background traffic AM and PM peak hour traffic distribution – Site access 2

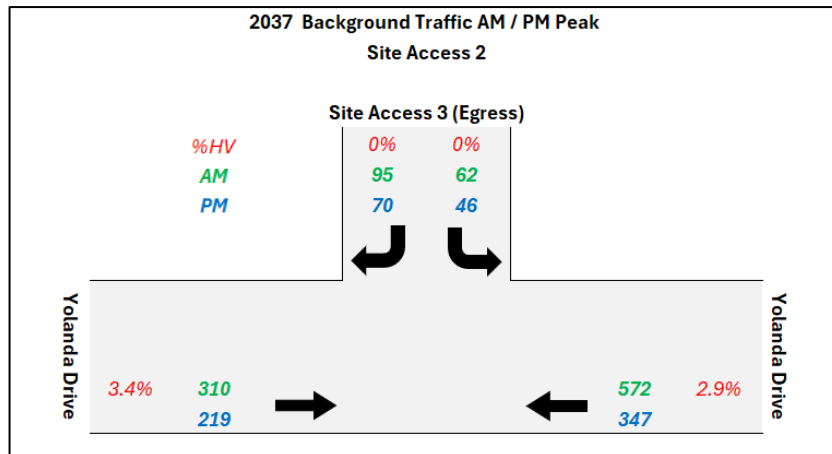


Figure 28. 2037 Background traffic AM and PM peak hour traffic distribution – Site access 3

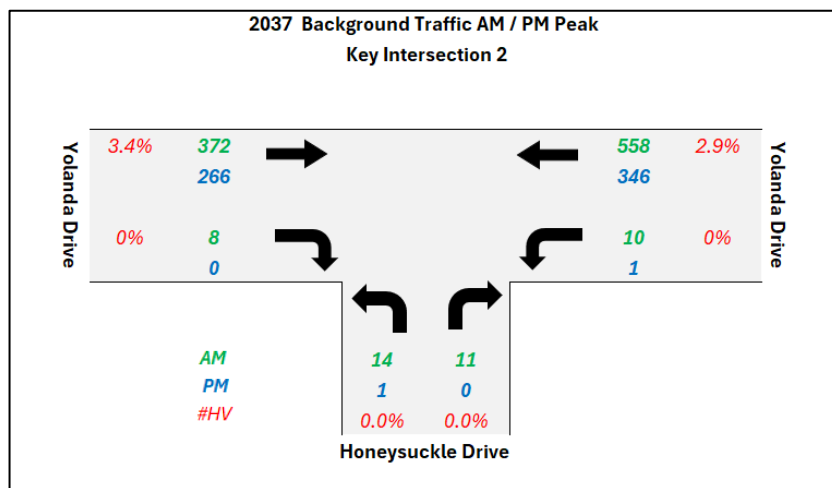


Figure 29. 2037 Background traffic AM and PM peak hour traffic distribution – Key intersection 2

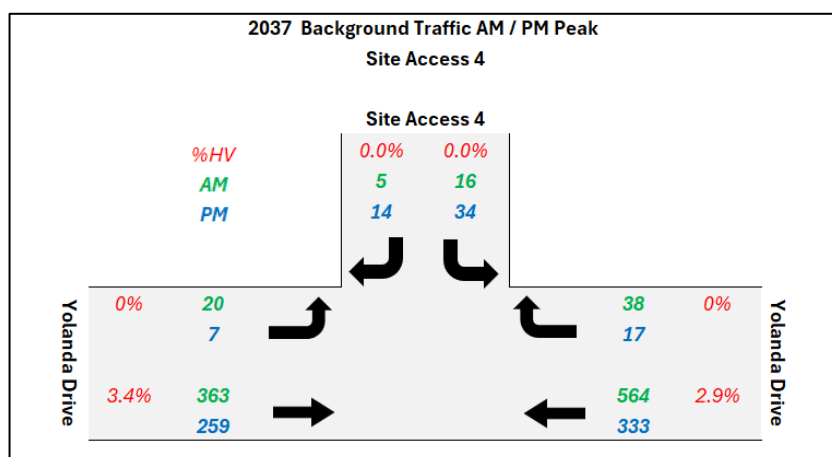
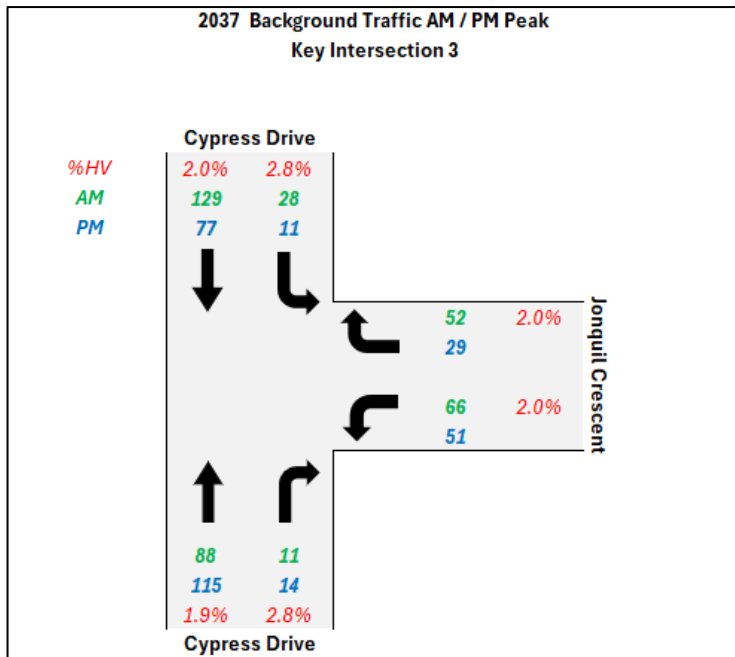
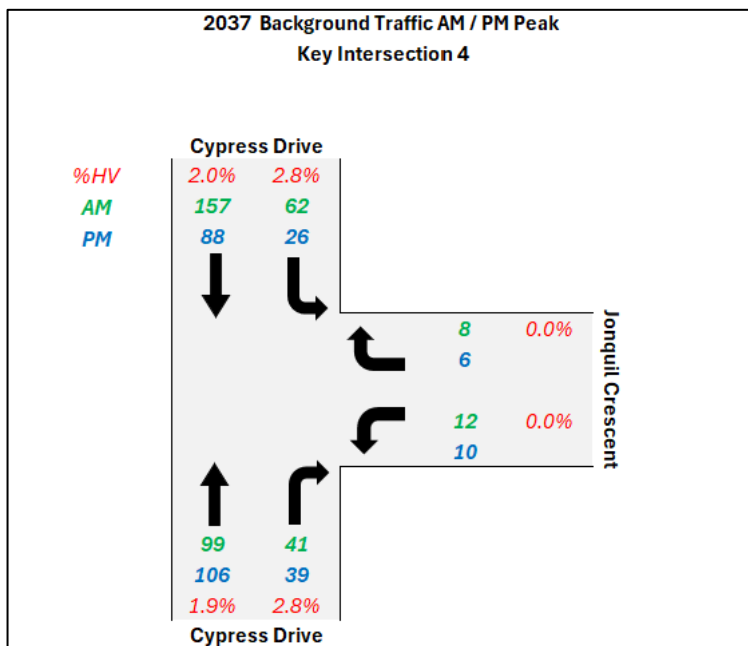


Figure 30. 2037 Background traffic AM and PM peak hour traffic distribution – Site access 4



**Figure 31.** 2037 Background traffic AM and PM peak hour traffic distribution – Key intersection 3



**Figure 32.** 2037 Background traffic AM and PM peak hour traffic distribution – Key intersection 4

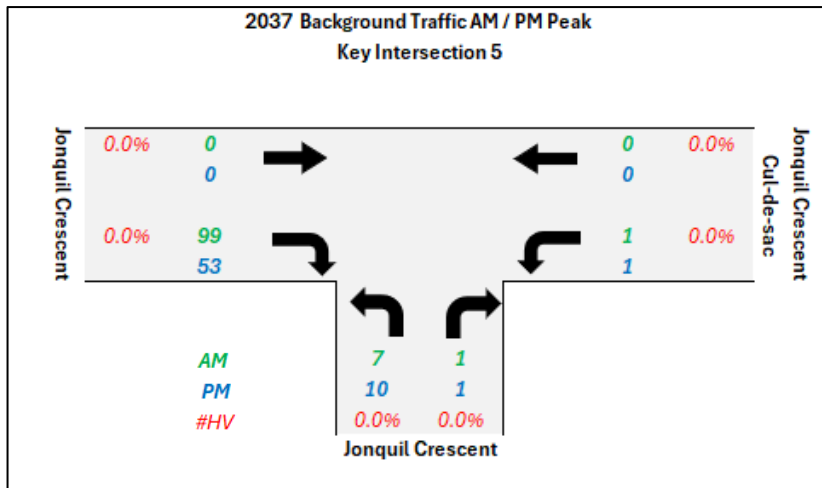


Figure 33. 2037 Background traffic AM and PM peak hour traffic distribution – Key intersection 5

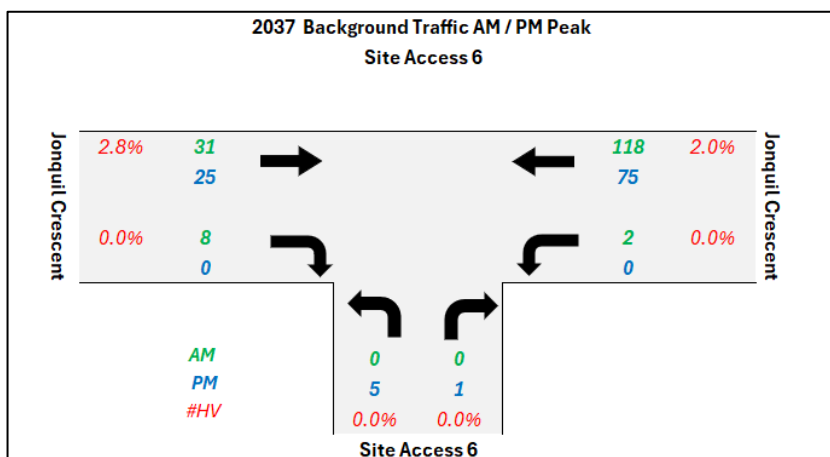


Figure 34. 2037 Background traffic AM and PM peak hour traffic distribution – Site access 6

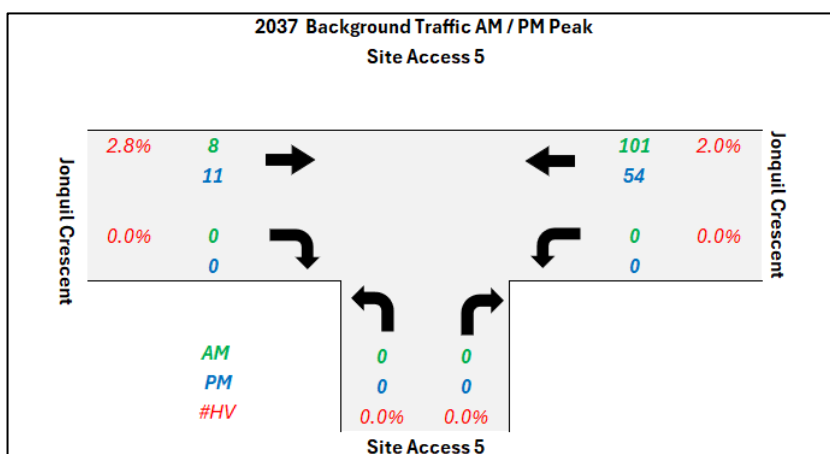


Figure 35. 2037 Background traffic AM and PM peak hour traffic distribution – Site access 5



## 6.0 DEVELOPMENT TRAFFIC

### 6.1 DEVELOPMENT TRAFFIC GENERATION

#### 6.1.1 Traffic Generation

In 2024, the subject site had seven hundred (700) students and eighty-seven (87) full-time equivalent (FTE) staff. It is projected that this will grow to seven hundred and seventy (770) students and ninety-eight (98) FTE staff by 2032. This will be an increase of **seventy (70) students** and **eleven (11) FTE** staff. For the purpose of this assessment, the projected increase has been assumed to occur in 2027 and the increase in students and staff numbers has been determined to estimate the anticipated increase in development traffic generation. Refer to **Table 7** for the current and projected student and staff numbers.

*Table 7. 2024 and projected student and staff numbers*

| Description        | 2024         | Current (2026) | Projected  |
|--------------------|--------------|----------------|------------|
| Kindy              | 38           | 22             | 25         |
| Prep               | 49           | 49             | 50         |
| Primary            | 316          | 307            | 318        |
| Secondary          | 297          | 343            | 377        |
| <b>Total</b>       | <b>700</b>   | <b>721</b>     | <b>770</b> |
| <b>Staff (FTE)</b> | <b>86.73</b> | <b>94</b>      | <b>98</b>  |

During the traffic count activity, it was observed that a significant number of vehicles were dropping off multiple children at once. To account for this, a ratio of two (2) students per vehicle has been adopted in the analysis. Based on this assumption, the resulting development-related traffic increase attributed to student drop-offs during the peak hour is estimated at thirty-five (35) vehicle trips.

For the proposed increase in staff numbers, it is acknowledged that not all staff are likely to arrive during the peak hour. However, to ensure a conservative assessment, a worst-case scenario has been assumed in which all additional staff members arrive during the peak hour. Based on this assumption, the development-related traffic increase from staff is estimated at eleven (11) vehicle trips during the peak hour. The total proposed development traffic increase during the peak hour amounts to **forty-six (46) vehicle trips**.

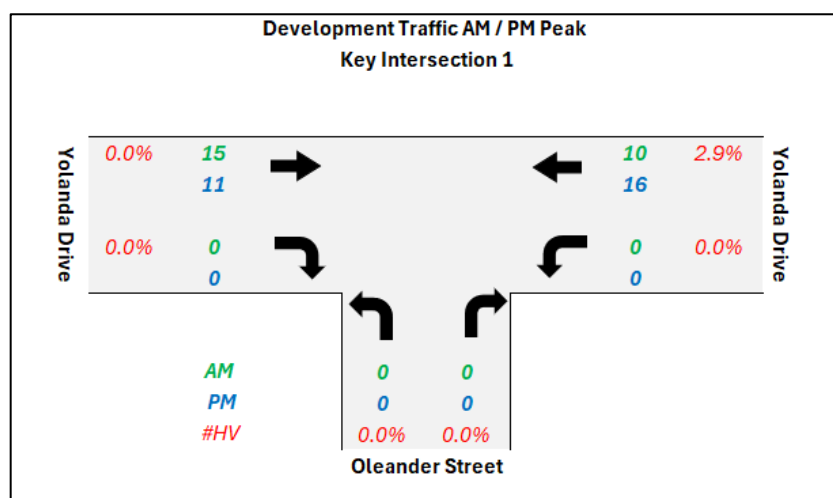
In addition to the above the following development traffic distribution assumptions have been made as part of the assessment regarding the development traffic:

- Traffic generated along the extended parking area (Site access 4)
  - Currently, there are fifty (50) parking spaces along Site access 4. With the proposed addition of twenty-five (25) spaces, the total capacity will increase to seventy-five (75) spaces, representing 1.5 times the original capacity.
  - The projected 2027 traffic count (through and turn movements) at Site access 4 has been multiplied by 1.5 to obtain the anticipated traffic movement volumes at the access.
  - The increase in the peak hour traffic (development traffic) in Site access 4 in the AM PH is eighteen (18) trips/hr and in the PM PH is 11 trips/hr.
  - In the AM peak hour, it is assumed that all vehicles are entering Site access 4, with no vehicles exiting. Of the inbound traffic, a 65:35 distribution is applied to right-turn and left-turn movements, respectively.
  - In the PM peak hour, it is assumed that all vehicles are exiting Site access 4, with no inbound movements. For outbound traffic, turning movements are distributed assuming 30% turning right out and 70% turning left out.
- Traffic generated from student's drop-off and pick-up
  - The remaining vehicle trips from the proposed development traffic have been distributed between the designated drop-off and pick-up areas, with twenty-eight (28) trips occurring in the AM peak hour and thirty-five (35) trips in the PM peak hour.
  - **60%** of the vehicles are assumed to drop-off and pick-up to/from Yolanda Drive and **40%** of the vehicles assumed to be to/from Jonquil Crescent.
  - The following assumptions have been made regarding **Yolanda Drive** traffic:
    - All student drop-off and pick-up traffic is assumed to enter via Site access 2 and exit via Site access 3.
    - In the AM and PM peak hours, vehicles entering Site access 2 from Yolanda Drive are distributed with 53% turning left in and 47% turning right in (as per background traffic distribution).
    - In the AM and PM peak hour, vehicles exiting Site Access 3 from the drop-off/pick-up area are distributed with 60% turning right out and 40% turning left out (as per background traffic distribution).

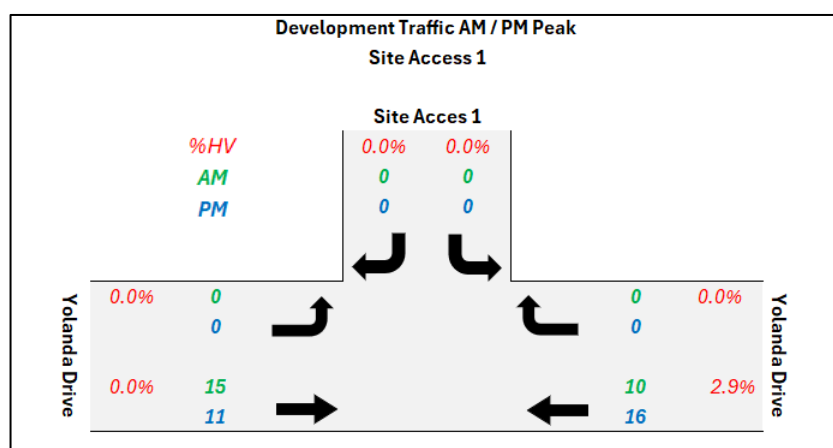
- o The following assumptions have been made regarding **Cypress Drive** and **Jonquil Crescent** traffic:
  - Vehicle distribution between Key intersections 3 and 4 is based on observed traffic counts, with 30% of vehicles entering/exiting at Key intersection 3 and 70% entering at Key intersection 4 before exiting via Key intersection 3.
  - At Key intersection 3, in the AM peak hour, 30% of the vehicles are turning right in, while 70% turn left in. While in the PM peak hour, 55% of the vehicles assumed to turn right in and 45% turn left in.
  - At Key intersection 4, in the AM peak hour, 40% of the vehicles turn right in, while 60% turn left in. While in the PM peak hour, 60% of the vehicles assumed to turn right in and 40% are turn left in.
  - For exiting vehicles, in the AM and PM peak hour, 10% of the vehicles are assumed to exit to Key intersection 4 and 90% exit to Key intersection 3.
  - Within the vehicles exiting Key intersection 3, in the AM and PM peak hour, 40% are turning right out and 60% are turning left out.
  - Within the vehicles exiting Key intersection 4, in the AM and PM peak hour, 100% turn right out and 0% are turn left out.
- Other Assumptions
  - o Traffic from Site access 1 and Site access 5 has been assumed to be negligible as these are maintenance accesses (i.e. for deliveries and refuse activities) which are not typically used during the peak hours. Although one (1) car parking space is provided at Site Access 1 for college maintenance vehicle, it is understood that this operates outside the peak hour periods.
  - o No development traffic is assumed to/from Site access 6 (staff car parking) along Jonquil Crescent, as this facility is considered to be already fully occupied and unable to accommodate additional traffic demand.
  - o Site Access 7 is the driveway of the recently acquired 9 Jonquil Crescent which serves as the temporary administration office. For the purpose of this assessment, it is also assumed that this facility is already fully occupied and is unable to accommodate additional traffic demand.

### 6.1.2 Development Traffic Distribution

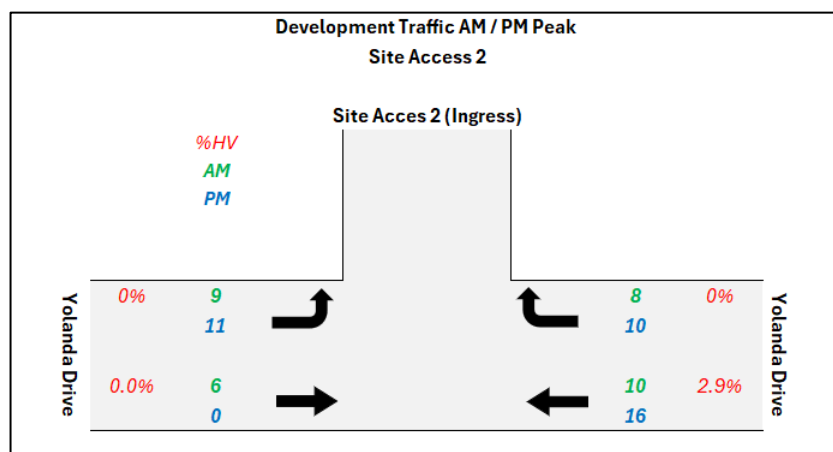
The development traffic distribution is summarised in **Figures 36 to 46**.



**Figure 36.** Development traffic AM and PM peak hour traffic distribution – Key Intersection 1

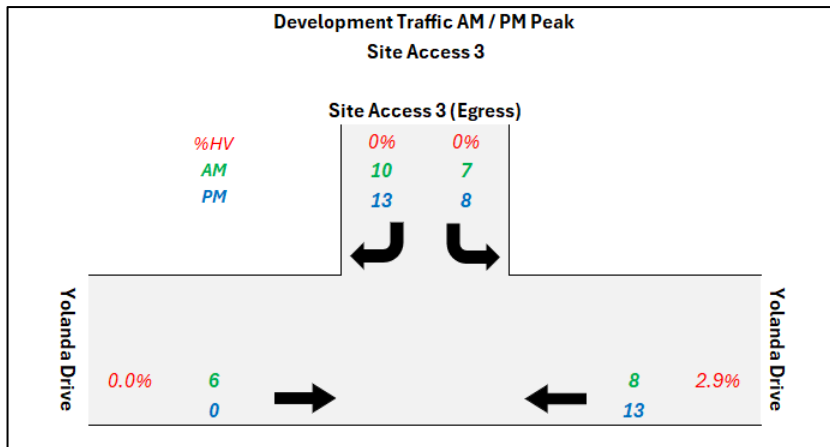


**Figure 37.** Development traffic AM and PM peak hour traffic distribution – Site Access 1

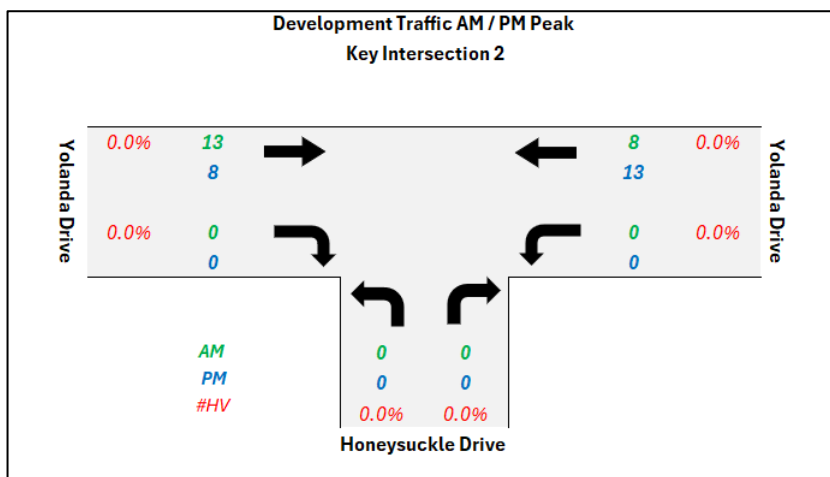


**Figure 38.** Development traffic AM and PM peak hour traffic distribution – Site Access 2

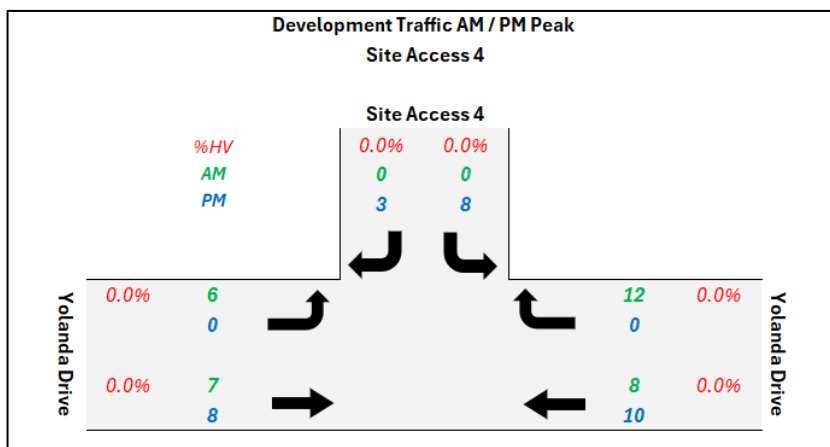




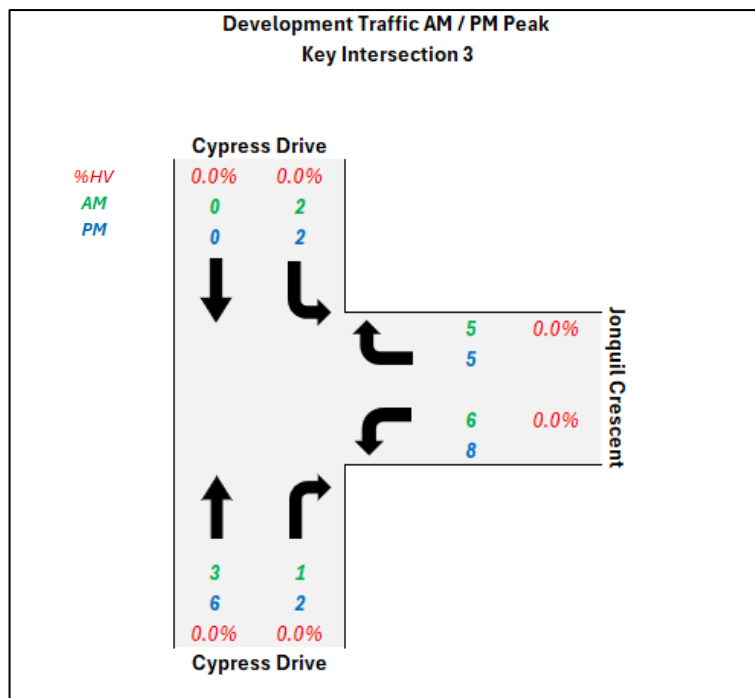
**Figure 39.** Development traffic AM and PM peak hour traffic distribution – Site Access 3



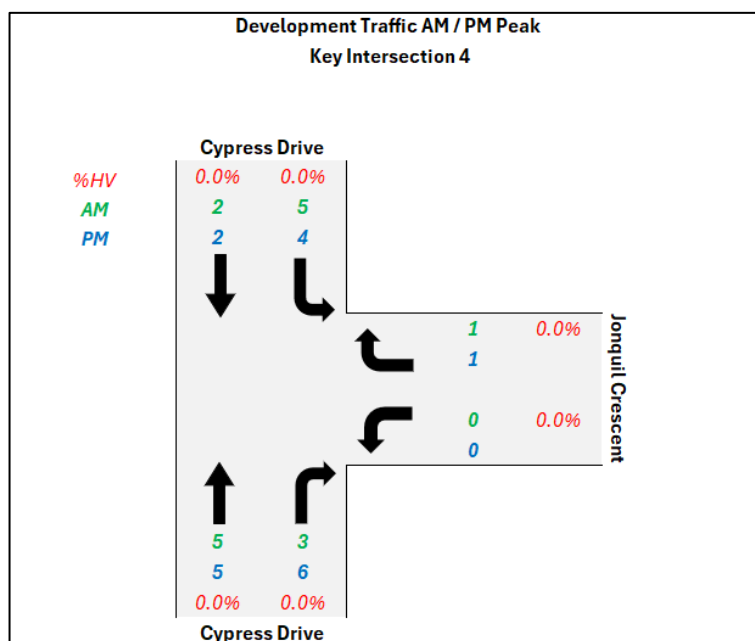
**Figure 40.** Development traffic AM and PM peak hour traffic distribution – Key Intersection 2



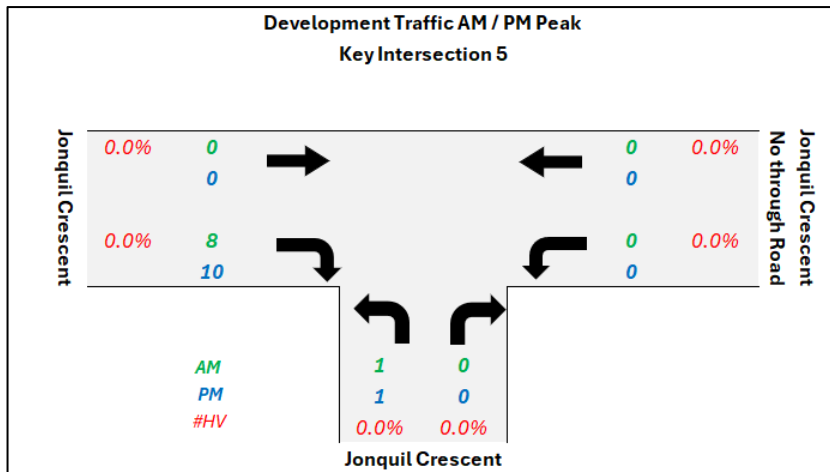
**Figure 41.** Development traffic AM and PM peak hour traffic distribution – Site Access 4



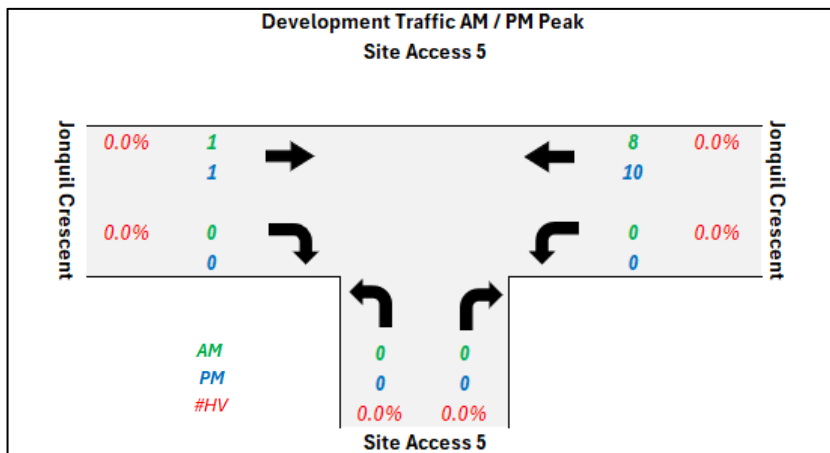
**Figure 42.** Development traffic AM and PM peak hour traffic distribution – Key Intersection 3



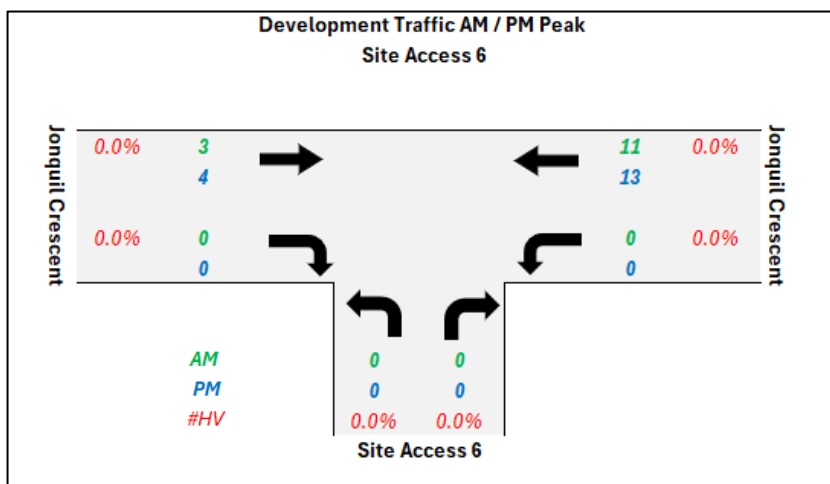
**Figure 43.** Development traffic AM and PM peak hour traffic distribution – Internal Intersection 4



**Figure 44.** Development traffic AM and PM peak hour traffic distribution – Key intersection 5



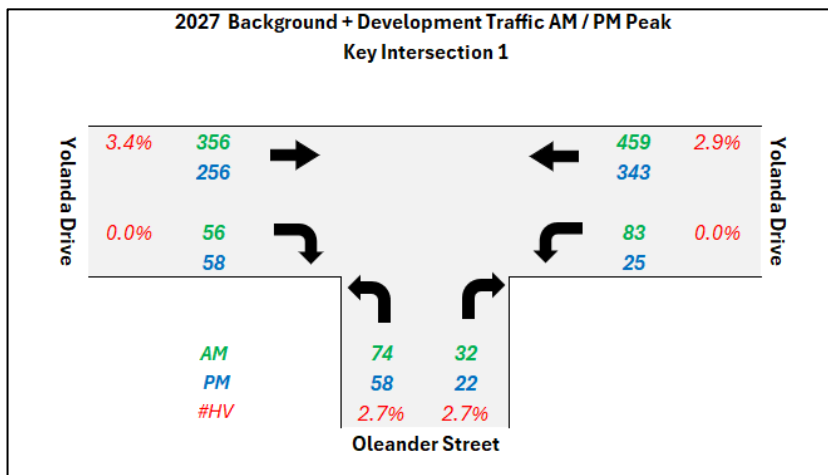
**Figure 45.** Development traffic AM and PM peak hour traffic distribution – Site Access 5



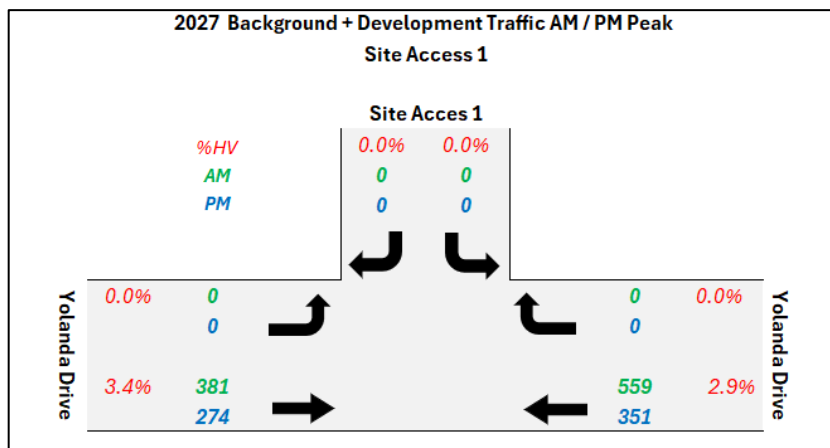
**Figure 46.** Development traffic AM and PM peak hour traffic distribution – Site Access 6

## 7.0 WITH DEVELOPMENT TRAFFIC (BACKGROUND + DEVELOPMENT)

The 2027 with development traffic distribution at site accesses and key intersections are summarised in **Figures 47 to 57**. The 10-year horizon (2037) with development traffic is summarised in **Figures 58 to 68**. Please note that some numbers have a discrepancy of plus/minus one (1) due to rounding to the nearest whole number following summation of background and development traffic.



**Figure 47.** 2027 With development AM and PM Peak hour traffic distribution – Key Intersection 1



**Figure 48.** 2027 With development AM and PM Peak hour traffic distribution – Site Access 1

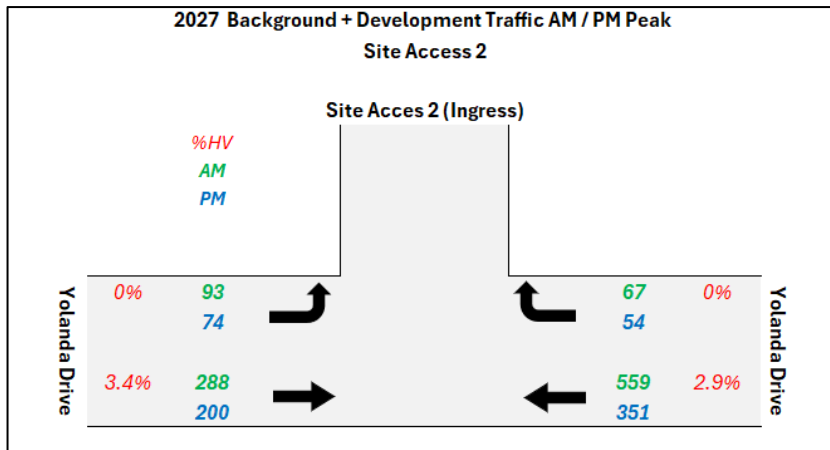


Figure 49. 2027 With development AM and PM Peak hour traffic distribution – Site Access 2

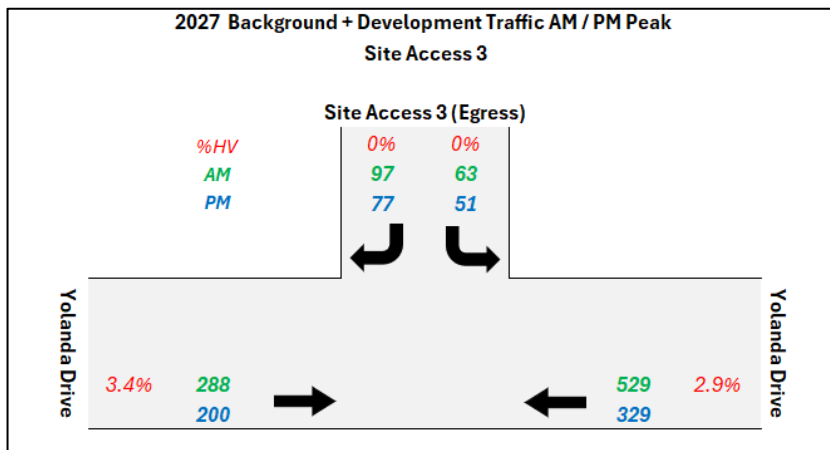


Figure 50. 2027 With development AM and PM Peak hour traffic distribution – Site Access 3

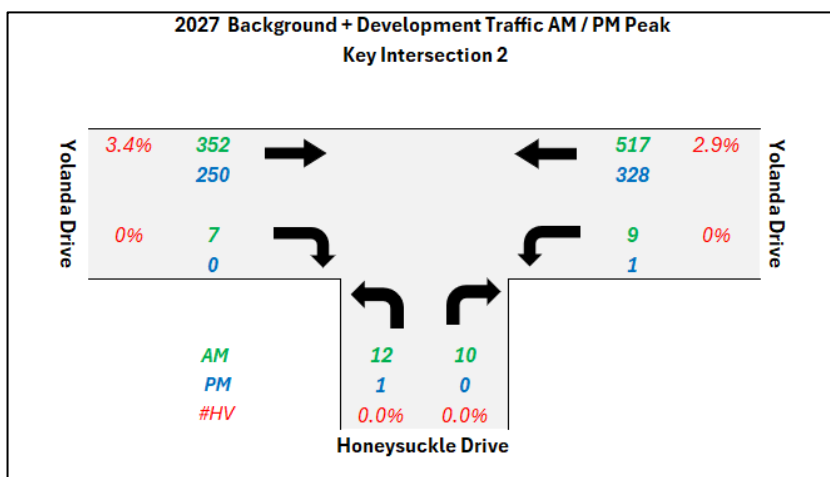


Figure 51. 2027 With development AM and PM Peak hour traffic distribution – Key Intersection 2



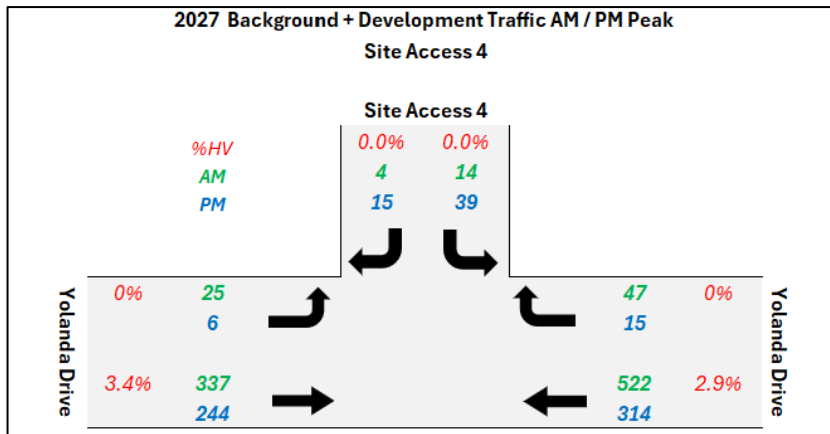


Figure 52. 2027 With development AM and PM Peak hour traffic distribution – Site Access 4

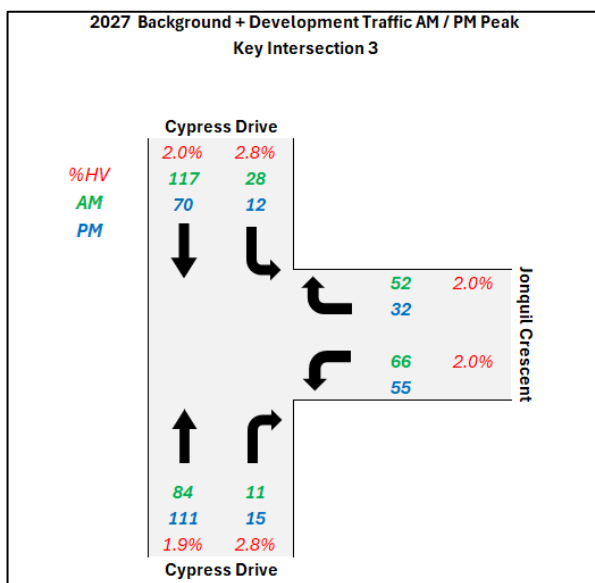


Figure 53. 2027 With development AM and PM Peak hour traffic distribution – Key Intersection 3

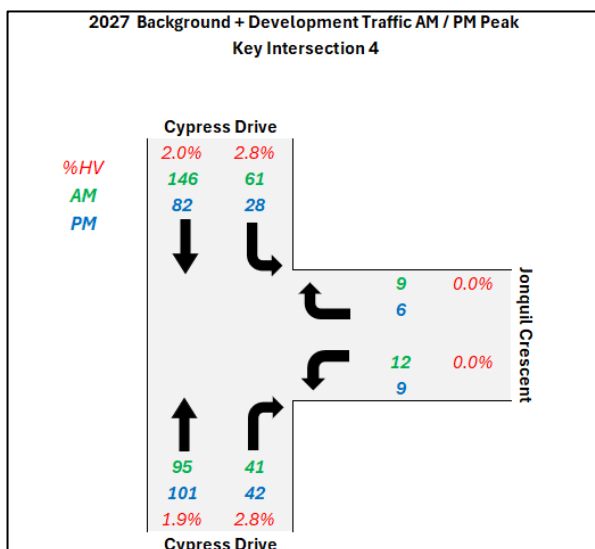


Figure 54. 2027 With development AM and PM Peak hour traffic distribution – Key Intersection 4

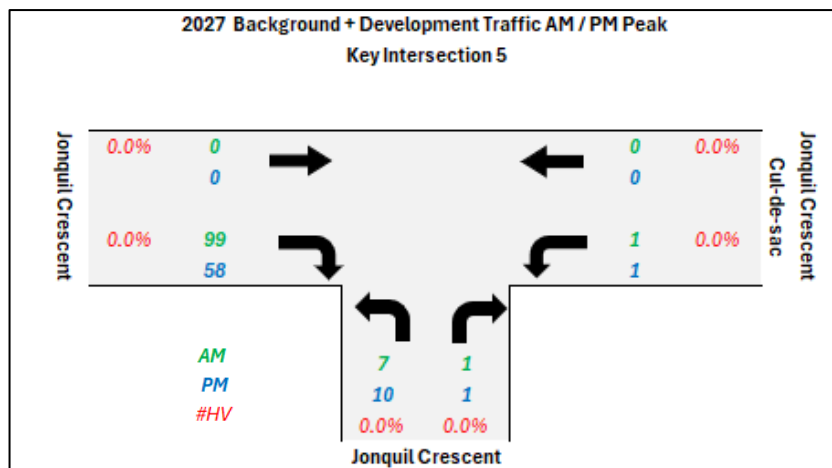


Figure 55. 2027 With development AM and PM Peak hour traffic distribution – Key intersection 5

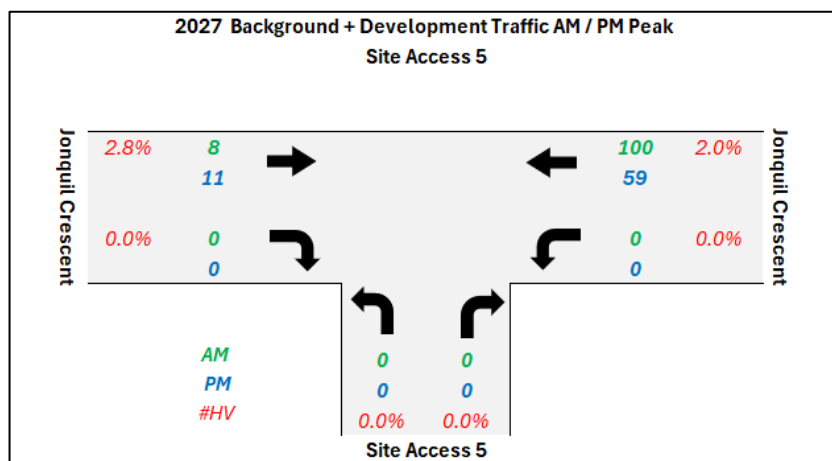


Figure 56. 2027 With development AM and PM Peak hour traffic distribution – Site Access 5

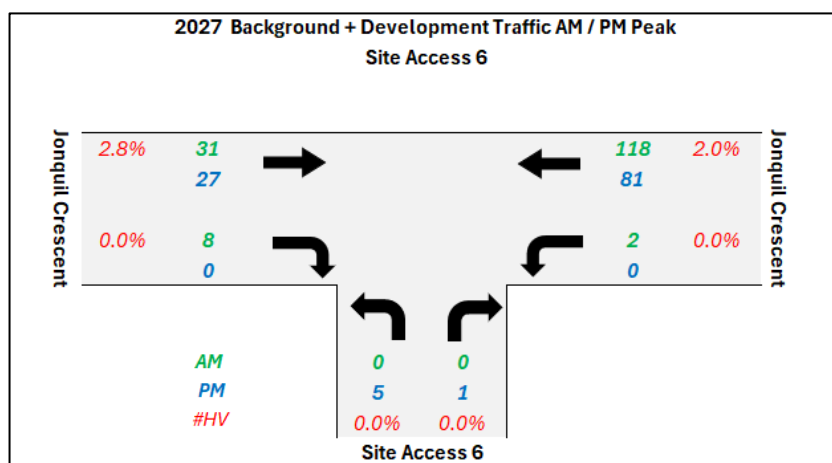


Figure 57. 2027 With development AM and PM Peak hour traffic distribution – Site Access 6

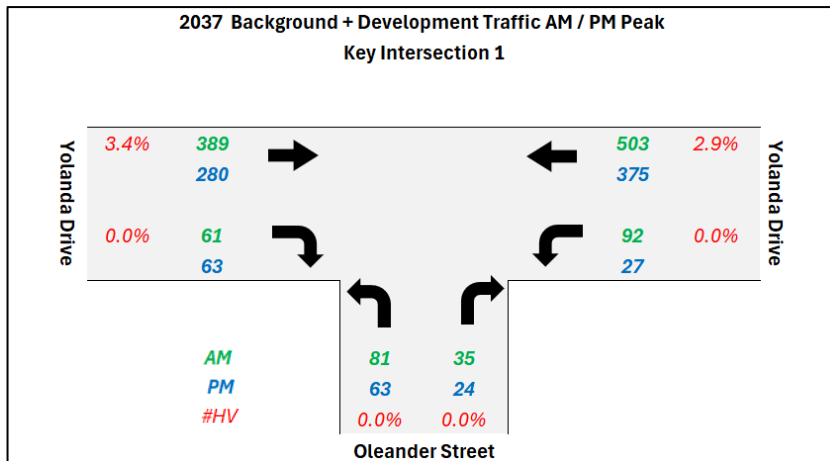


Figure 58. 2037 With development AM and PM Peak hour traffic distribution – Key Intersection 1

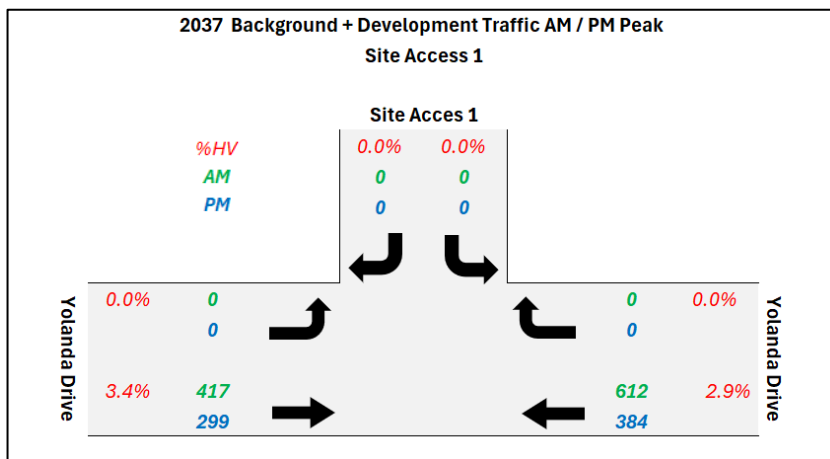


Figure 59. 2037 With development AM and PM Peak hour traffic distribution – Site Access 1

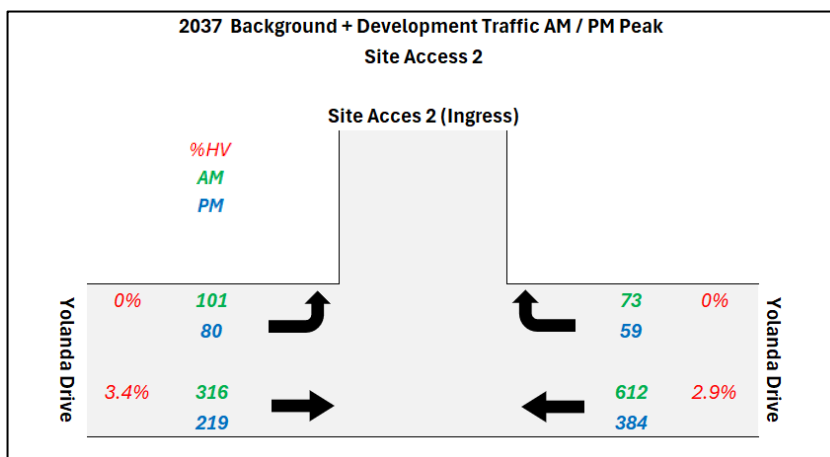
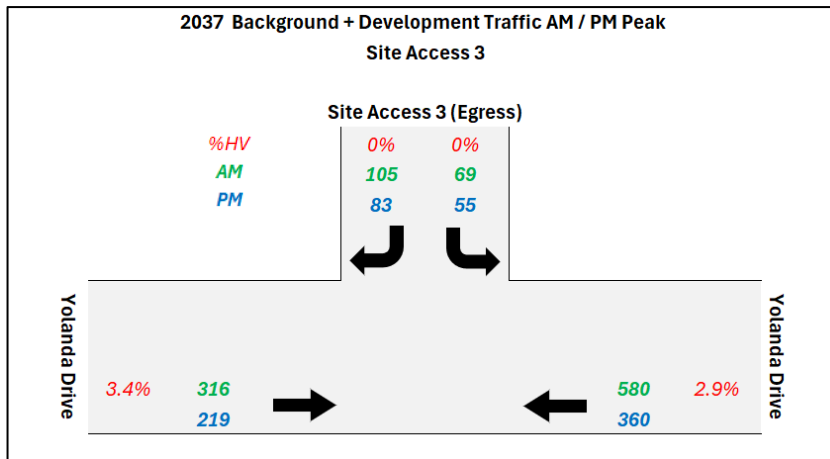
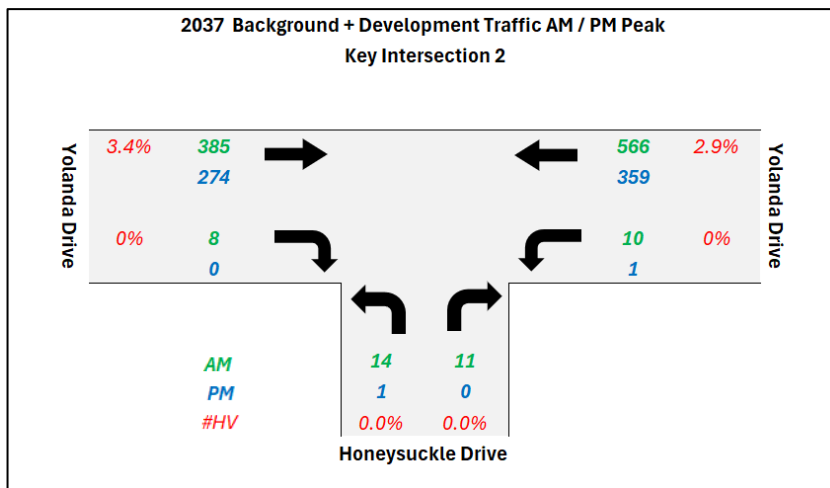


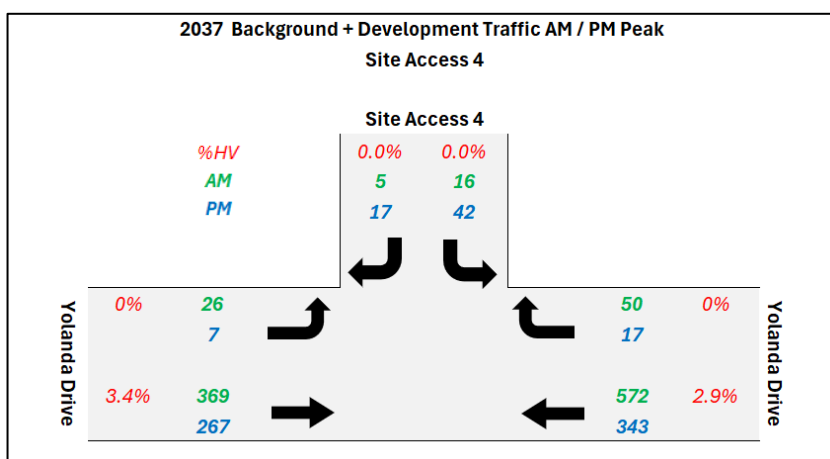
Figure 60. 2037 With development AM and PM Peak hour traffic distribution – Site Access 2



**Figure 61.** 2037 With development AM and PM Peak hour traffic distribution – Site Access 3



**Figure 62.** 2037 With development AM and PM Peak hour traffic distribution – Key Intersection 2



**Figure 63.** 2037 With development AM and PM Peak hour traffic distribution – Site Access 4

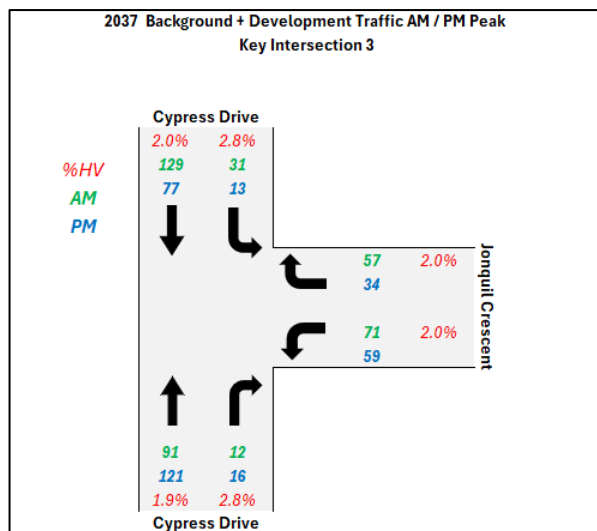


Figure 64. 2037 With development AM and PM Peak hour traffic distribution – Key Intersection 3

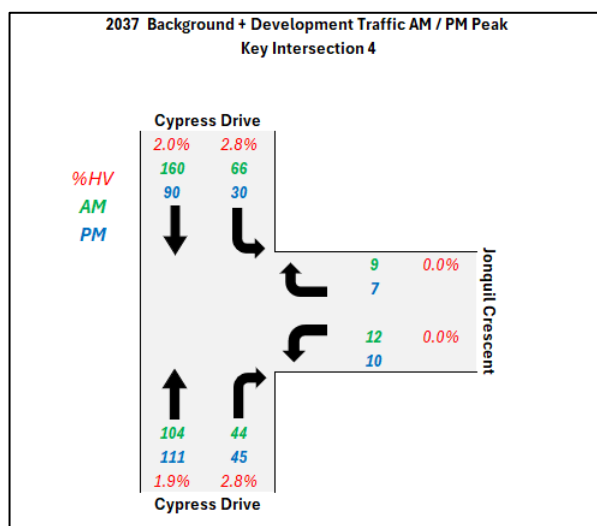


Figure 65. 2037 With development AM and PM Peak hour traffic distribution – Key Intersection 4

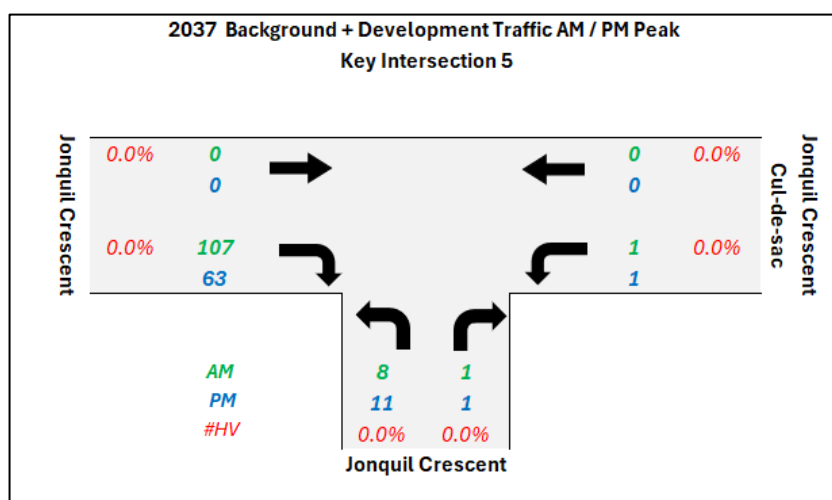


Figure 66. 2037 With development AM and PM Peak hour traffic distribution – Key intersection 5



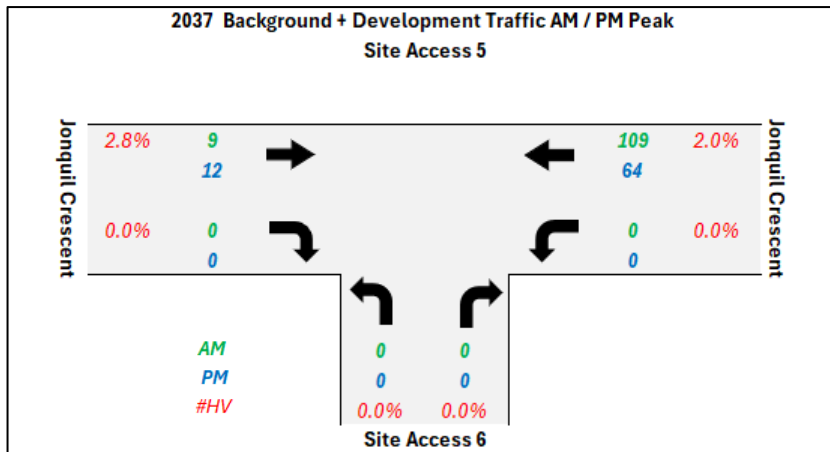


Figure 67. 2037 With development AM and PM Peak hour traffic distribution – Site Access 5

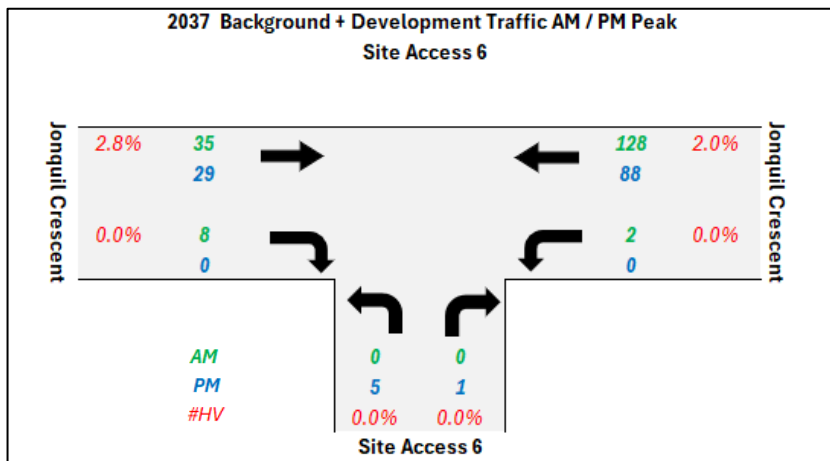


Figure 68. 2037 With development AM and PM Peak hour traffic distribution – Site Access 6

## 8.0 TRAFFIC IMPACT ASSESSMENT

### 8.1 SIDRA INTERSECTION ANALYSIS

Operational performance of the key intersections and accesses has been performed with the aid of SIDRA Intersections version 10.0. The following parameters are typically adopted to assess operational performance of an intersections:

- Degree of Saturation (DoS) – is the ratio of demand flow (or number of vehicles) to the physical capacity of the intersection or approach and is usually represented by a value that lies between zero and one. A DoS in excess of 1.0 indicates that the intersection will operate above capacity and that long delays and congestion will occur;
- Average Delay – is usually defined as the difference in time between interrupted and uninterrupted travel times through an intersection;
- Queue Length – is the 95th percentile back of queue length. This is the length to the back of the queue for a particular approach which 95% of all observed queue lengths fall below; and
- Level of Service (LOS) – an index of the operational performance of traffic-on-traffic lane, approach, intersection, route or network, based on measures such as delay, degree of saturation, density, speed, congestion coefficient, speed efficiency or travel time index during a given flow period. This provides a quantitative stratification of a performance measure or measures that represent the quality of service, measured on an A to F scale, with LOS A representing the best operating conditions from the traveller's perspective and LOS F the worst.

#### 8.1.1 Intersection Performance Assessment Criteria

The two key performance measurements adopted to assess the intersection operational conditions were Degree of Saturation (DoS) and Level of Service (LOS).

In general, the intersection capacity DoS, where it is considered that the operation of the intersection is constrained, are:

- 0.80 (80%) for un-signalised intersections;
- 0.85 (85%) for roundabouts; and
- 0.90 (90%) for signalised intersections.

The typical LOS, its characteristics and rating are defined in **Table 8**.

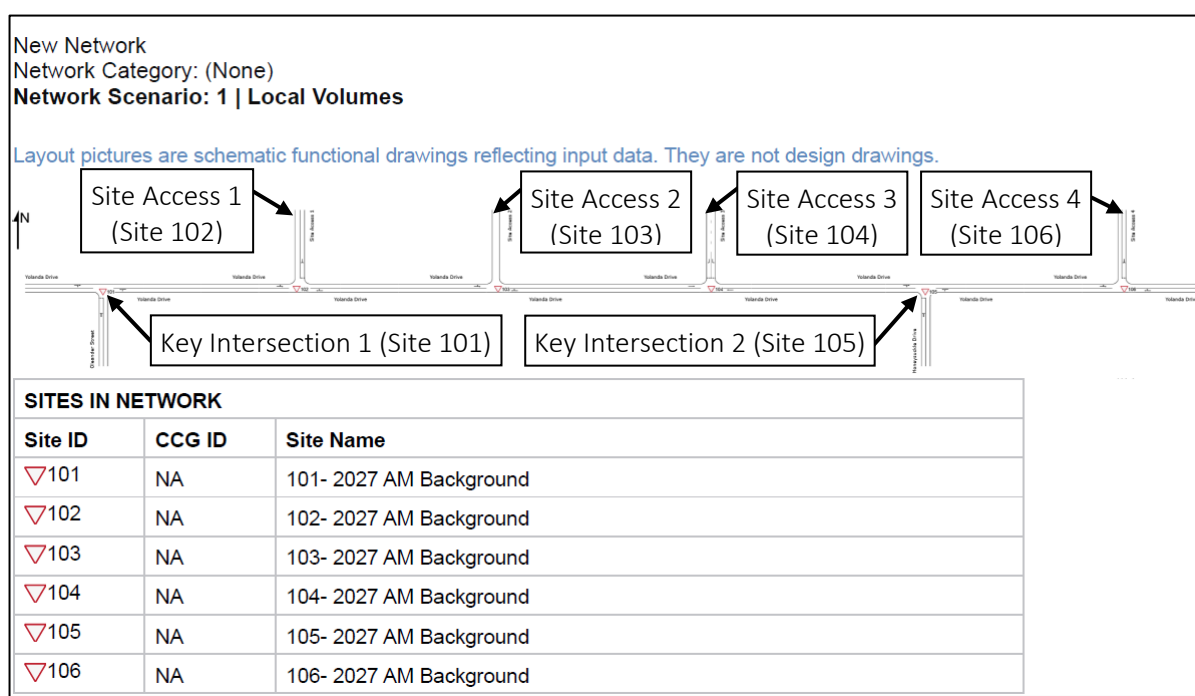
**Table 8.** Summary of traffic movements

| LOS | Description                       | Rating     |
|-----|-----------------------------------|------------|
| A   | Free, unrestrictive flow          | Very good  |
| B   | Mostly free flow, few disruptions | Very good  |
| C   | Stable flow                       | Good       |
| D   | Mostly stable flow, some delays   | Acceptable |
| E   | Congested                         | Bad        |
| F   | Forced flow                       | Bad        |

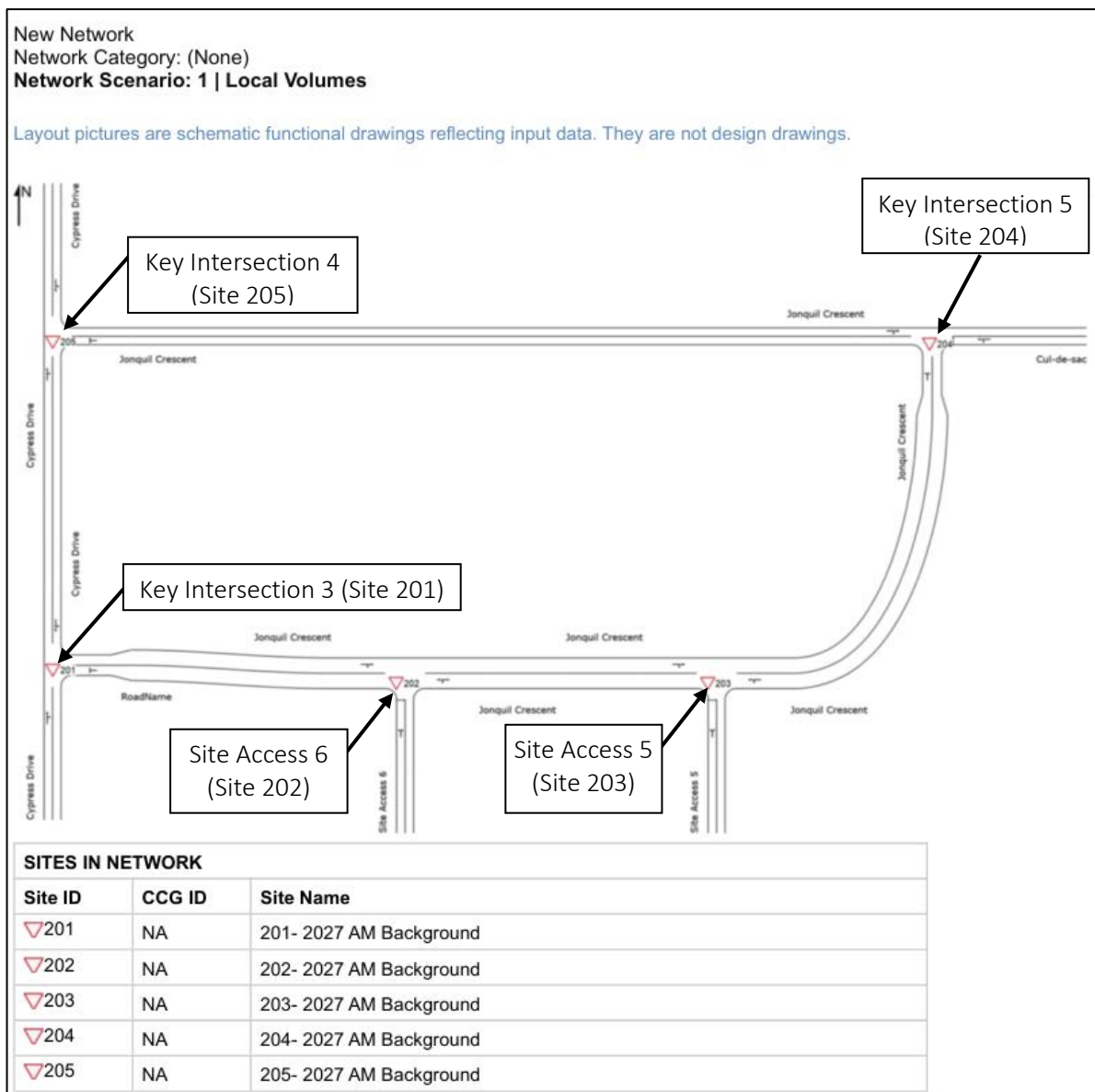
## 8.2 INTERSECTION LAYOUT

### 8.2.1 Background and with development Layout

The traffic fronting the subject site has been modelled as two (2) networks. Network 1 includes all the key intersections and site accesses along Yolanda Drive and Network 2 includes all key intersections and access on Jonquil Crescent and Cypress Drive. Refer to **Figure 69** for Network 1 and **Figure 70** for Network 2 background and with development network layouts.



**Figure 69.** Network 1 (Yolanda Drive) background and with development network layout



**Figure 70.** Network 2 (Cypress Drive and Jonquil Crescent) background and with development network layout

## 8.3 INTERSECTION PERFORMANCE

### 8.3.1 Base Year (2027) SIDRA results

SIDRA intersection assessment has been conducted for all the key intersections and site accesses. Refer to **Section 3.4** for the key intersections and accesses. The background and with development 2027 AM and PM movement summary results are summarised in **Tables 9** and **10** respectively. Refer to **Appendix B** for SIDRA movement reports.

**Table 9.** 2027 AM peak hour background and with development movement summary

| Site No. | Approach            | Movement   | 2027 AM Peak Hour |           |       |                  |           |       |
|----------|---------------------|------------|-------------------|-----------|-------|------------------|-----------|-------|
|          |                     |            | Background        |           |       | With development |           |       |
|          |                     |            | DoS               | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 101      | Oleander Street (S) | Left Turn  | 0.154             | 7.600     | LOS A | 0.158            | 7.700     | LOS A |
|          |                     | Right Turn | 0.154             | 12.200    | LOS B | 0.158            | 12.600    | LOS B |
|          |                     | Approach   | 0.154             | 9.000     | LOS A | 0.158            | 9.200     | LOS A |
|          | Yolanda Drive (E)   | Left Turn  | 0.296             | 5.200     | LOS A | 0.302            | 5.200     | LOS A |
|          |                     | Through    | 0.296             | 0.000     | LOS A | 0.302            | 0.000     | LOS A |
|          |                     | Approach   | 0.296             | 0.800     | NA    | 0.302            | 0.800     | NA    |
|          | Yolanda Drive (W)   | Through    | 0.250             | 0.600     | LOS A | 0.259            | 0.700     | LOS A |
|          |                     | Right Turn | 0.250             | 8.200     | LOS A | 0.259            | 8.300     | LOS A |
|          |                     | Approach   | 0.250             | 1.700     | NA    | 0.259            | 1.700     | NA    |
|          | Overall             |            | 0.296             | 2.000     | NA    | 0.302            | 2.000     | NA    |
| 102      | Yolanda Drive (E)   | Through    | 0.305             | 0.000     | LOS A | 0.311            | 0.000     | LOS A |
|          |                     | Right Turn | 0.305             | 2.400     | LOS A | 0.311            | 2.400     | LOS A |
|          |                     | Approach   | 0.305             | 0.000     | NA    | 0.311            | 0.000     | NA    |
|          | Site Access 1 (N)   | Left Turn  | 0.003             | 4.800     | LOS A | 0.003            | 4.900     | LOS A |
|          |                     | Through    | 0.003             | 9.300     | LOS A | 0.003            | 9.600     | LOS A |
|          |                     | Approach   | 0.003             | 7.000     | LOS A | 0.003            | 7.200     | LOS A |
|          | Yolanda Drive (W)   | Left Turn  | 0.204             | 5.200     | LOS A | 0.212            | 5.200     | LOS A |
|          |                     | Through    | 0.204             | 0.000     | LOS A | 0.212            | 0.000     | LOS A |
|          |                     | Approach   | 0.204             | 0.000     | NA    | 0.212            | 0.000     | NA    |
|          | Overall             |            | 0.305             | 0.000     | NA    | 0.311            | 0.000     | NA    |
| 103      | Yolanda Drive (E)   | Through    | 0.355             | 0.300     | LOS A | 0.369            | 0.300     | LOS A |
|          |                     | Right Turn | 0.355             | 5.100     | LOS A | 0.369            | 5.200     | LOS A |
|          |                     | Approach   | 0.355             | 0.700     | NA    | 0.369            | 0.800     | NA    |
|          | Yolanda Drive (W)   | Left Turn  | 0.205             | 2.500     | LOS A | 0.213            | 2.500     | LOS A |
|          |                     | Through    | 0.205             | 0.000     | LOS A | 0.213            | 0.000     | LOS A |
|          |                     | Approach   | 0.205             | 0.000     | NA    | 0.213            | 0.600     | NA    |
|          | Overall             |            | 0.355             | 0.700     | NA    | 0.369            | 0.800     | NA    |
| 104      | Yolanda Drive (E)   | Through    | 0.289             | 0.000     | LOS A | 0.293            | 0.000     | LOS A |
|          |                     | Approach   | 0.289             | 0.000     | NA    | 0.293            | 0.000     | NA    |
|          | Site Access 3 (N)   | Left Turn  | 0.048             | 5.100     | LOS A | 0.054            | 5.100     | LOS A |
|          |                     | Through    | 0.178             | 9.600     | LOS A | 0.203            | 9.900     | LOS A |
|          |                     | Approach   | 0.178             | 7.800     | LOS A | 0.203            | 8.000     | LOS A |
|          | Yolanda Drive (W)   | Through    | 0.157             | 0.000     | LOS A | 0.160            | 0.000     | LOS A |
|          |                     | Approach   | 0.157             | 0.000     | NA    | 0.160            | 0.000     | NA    |
|          | Overall             |            | 0.289             | 1.200     | NA    | 0.293            | 1.300     | NA    |

**Table 10.** 2027 AM peak hour background and with development movement summary (continued)

| 2027 AM Peak Hour |                       |            |            |           |       |                  |           |       |
|-------------------|-----------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach              | Movement   | Background |           |       | With development |           |       |
|                   |                       |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 105               | Honeysuckle Drive (S) | Left Turn  | 0.035      | 7.700     | LOS A | 0.036            | 7.700     | LOS A |
|                   |                       | Right Turn | 0.035      | 10.900    | LOS B | 0.036            | 11.200    | LOS B |
|                   |                       | Approach   | 0.035      | 9.100     | LOS A | 0.036            | 9.300     | LOS A |
|                   | Yolanda Drive (E)     | Left Turn  | 0.287      | 2.700     | LOS A | 0.292            | 2.700     | LOS A |
|                   |                       | Through    | 0.287      | 0.000     | LOS A | 0.292            | 0.000     | LOS A |
|                   |                       | Approach   | 0.287      | 0.100     | NA    | 0.292            | 0.100     | NA    |
|                   | Yolanda Drive (W)     | Through    | 0.196      | 0.100     | LOS A | 0.203            | 0.100     | LOS A |
|                   |                       | Right Turn | 0.196      | 4.900     | LOS A | 0.203            | 5.000     | LOS A |
|                   |                       | Approach   | 0.196      | 0.200     | NA    | 0.203            | 0.200     | NA    |
|                   | Overall               |            | 0.287      | 0.300     | NA    | 0.292            | 0.300     | NA    |
| 106               | Yolanda Drive (E)     | Through    | 0.315      | 0.200     | LOS A | 0.330            | 0.200     | LOS A |
|                   |                       | Right Turn | 0.315      | 6.800     | LOS A | 0.330            | 6.900     | LOS A |
|                   |                       | Approach   | 0.315      | 0.600     | NA    | 0.330            | 0.800     | NA    |
|                   | Site Access 4 (N)     | Left Turn  | 0.022      | 5.000     | LOS A | 0.022            | 5.100     | LOS A |
|                   |                       | Right Turn | 0.022      | 9.600     | LOS A | 0.022            | 10.000    | LOS A |
|                   |                       | Approach   | 0.022      | 6.000     | LOS A | 0.022            | 6.200     | LOS A |
|                   | Yolanda Drive (W)     | Left Turn  | 0.195      | 2.700     | LOS A | 0.202            | 2.700     | LOS A |
|                   |                       | Through    | 0.195      | 0.000     | LOS A | 0.202            | 0.000     | LOS A |
|                   |                       | Approach   | 0.195      | 0.100     | NA    | 0.202            | 0.200     | NA    |
|                   | Overall               |            | 0.315      | 0.500     | NA    | 0.330            | 0.700     | NA    |
| 201               | Cypress Drive (S)     | Through    | 0.051      | 0.100     | LOS A | 0.054            | 0.100     | LOS A |
|                   |                       | Right Turn | 0.051      | 3.700     | LOS A | 0.054            | 3.700     | LOS A |
|                   |                       | Approach   | 0.051      | 0.500     | NA    | 0.054            | 0.500     | NA    |
|                   | Jonquil Crescent (E)  | Left Turn  | 0.090      | 5.100     | LOS A | 0.100            | 5.100     | LOS A |
|                   |                       | Right      | 0.090      | 5.600     | LOS A | 0.100            | 5.600     | LOS A |
|                   |                       | Approach   | 0.090      | 5.300     | LOS A | 0.100            | 5.300     | LOS A |
|                   | Cypress Drive (N)     | Left Turn  | 0.079      | 3.700     | LOS A | 0.080            | 3.700     | LOS A |
|                   |                       | Through    | 0.079      | 0.000     | LOS A | 0.080            | 0.000     | LOS A |
|                   |                       | Approach   | 0.079      | 0.700     | NA    | 0.080            | 0.700     | NA    |
|                   | Overall               |            | 0.090      | 2.100     | NA    | 0.100            | 2.200     | NA    |
| 202               | Site Access 5 (S)     | Left Turn  | 0.002      | 3.000     | LOS A | 0.002            | 3.000     | LOS A |
|                   |                       | Right Turn | 0.002      | 3.100     | LOS A | 0.002            | 3.200     | LOS A |
|                   |                       | Approach   | 0.002      | 3.100     | LOS A | 0.002            | 3.100     | LOS A |
|                   | Jonquil Crescent (E)  | Left Turn  | 0.054      | 3.500     | LOS A | 0.060            | 3.500     | LOS A |
|                   |                       | Through    | 0.054      | 0.000     | LOS A | 0.060            | 0.000     | LOS A |
|                   |                       | Approach   | 0.054      | 0.100     | NA    | 0.060            | 0.100     | NA    |
|                   | Jonquil Crescent (W)  | Through    | 0.019      | 0.100     | LOS A | 0.021            | 0.100     | LOS A |
|                   |                       | Right Turn | 0.019      | 5.000     | LOS A | 0.021            | 5.100     | LOS A |
|                   |                       | Approach   | 0.019      | 1.200     | NA    | 0.021            | 1.100     | NA    |
|                   | Overall               |            | 0.054      | 0.400     | NA    | 0.060            | 0.400     | NA    |
| 203               | Site Access 6 (S)     | Left Turn  | 0.002      | 2.700     | LOS A | 0.002            | 2.800     | LOS A |
|                   |                       | Right Turn | 0.002      | 2.800     | LOS A | 0.002            | 2.800     | LOS A |
|                   |                       | Approach   | 0.002      | 2.800     | LOS A | 0.002            | 2.800     | LOS A |
|                   | Jonquil Crescent (E)  | Left Turn  | 0.047      | 3.400     | LOS A | 0.051            | 3.400     | LOS A |
|                   |                       | Through    | 0.047      | 0.000     | LOS A | 0.051            | 0.000     | LOS A |
|                   |                       | Approach   | 0.047      | 0.000     | NA    | 0.051            | 0.000     | NA    |
|                   | Jonquil Crescent (W)  | Through    | 0.004      | 0.000     | LOS A | 0.005            | 0.000     | LOS A |
|                   |                       | Right Turn | 0.004      | 3.700     | LOS A | 0.005            | 3.800     | LOS A |
|                   |                       | Approach   | 0.004      | 0.500     | NA    | 0.005            | 0.500     | NA    |
|                   | Overall               |            | 0.002      | 2.700     | LOS A | 0.002            | 2.800     | LOS A |



**Table 10.** 2027 AM peak hour background and with development movement summary (continued)

| 2027 AM Peak Hour |                                   |            |            |           |       |                  |           |       |
|-------------------|-----------------------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach                          | Movement   | Background |           |       | With development |           |       |
|                   |                                   |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 204               | Jonquil Crescent (S)              | Left Turn  | 0.004      | 3.400     | LOS A | 0.004            | 3.400     | LOS A |
|                   |                                   | Right Turn | 0.004      | 3.300     | LOS A | 0.004            | 3.300     | LOS A |
|                   |                                   | Approach   | 0.004      | 3.400     | NA    | 0.004            | 3.400     | NA    |
|                   | Jonquil Crescent (Cul-de-sac) (E) | Left Turn  | 0.002      | 2.700     | LOS A | 0.002            | 2.700     | LOS A |
|                   |                                   | Through    | 0.002      | 1.800     | LOS A | 0.002            | 1.800     | LOS A |
|                   |                                   | Approach   | 0.002      | 2.200     | LOS A | 0.002            | 2.300     | LOS A |
|                   | Jonquil Crescent (W)              | Through    | 0.054      | 0.000     | LOS A | 0.059            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.054      | 5.500     | LOS A | 0.059            | 5.500     | LOS A |
|                   |                                   | Approach   | 0.054      | 5.400     | NA    | 0.059            | 5.400     | NA    |
|                   | Overall                           |            | 0.054      | 5.200     | NA    | 0.059            | 5.200     | NA    |
| 205               | Cypress Drive (S)                 | Through    | 0.077      | 0.300     | LOS A | 0.086            | 0.300     | LOS A |
|                   |                                   | Right Turn | 0.077      | 4.300     | LOS A | 0.086            | 4.300     | LOS A |
|                   |                                   | Approach   | 0.077      | 1.500     | NA    | 0.086            | 1.400     | NA    |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.017      | 6.000     | LOS A | 0.019            | 6.000     | LOS A |
|                   |                                   | Right Turn | 0.017      | 6.600     | LOS A | 0.019            | 6.700     | LOS A |
|                   |                                   | Approach   | 0.017      | 6.200     | LOS A | 0.019            | 6.300     | LOS A |
|                   | Cypress Drive (N)                 | Left Turn  | 0.111      | 5.100     | LOS A | 0.115            | 5.100     | LOS A |
|                   |                                   | Through    | 0.111      | 0.000     | LOS A | 0.115            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.111      | 1.400     | NA    | 0.115            | 1.500     | NA    |
|                   | Overall                           |            | 0.111      | 1.700     | NA    | 0.115            | 1.800     | NA    |

**Table 10.** 2027 PM peak hour background and with development movement summary

| 2027 PM Peak Hour |                       |            |            |           |       |                  |           |       |
|-------------------|-----------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach              | Movement   | Background |           |       | With development |           |       |
|                   |                       |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 101               | Oleander Street (S)   | Left Turn  | 0.089      | 6.900     | LOS A | 0.091            | 6.900     | LOS A |
|                   |                       | Right Turn | 0.089      | 9.100     | LOS A | 0.091            | 9.400     | LOS A |
|                   |                       | Approach   | 0.089      | 7.500     | LOS A | 0.091            | 7.600     | LOS A |
|                   | Yolanda Drive (E)     | Left Turn  | 0.196      | 5.200     | LOS A | 0.204            | 5.200     | LOS A |
|                   |                       | Through    | 0.196      | 0.000     | LOS A | 0.204            | 0.000     | LOS A |
|                   |                       | Approach   | 0.196      | 0.400     | NA    | 0.204            | 0.400     | NA    |
|                   | Yolanda Drive (W)     | Through    | 0.186      | 0.400     | LOS A | 0.192            | 0.400     | LOS A |
|                   |                       | Right Turn | 0.186      | 7.000     | LOS A | 0.192            | 7.100     | LOS A |
|                   |                       | Approach   | 0.186      | 1.700     | NA    | 0.192            | 1.700     | NA    |
|                   | Overall               |            | 0.196      | 1.700     | NA    | 0.204            | 1.700     | NA    |
| 102               | Yolanda Drive (E)     | Through    | 0.187      | 0.000     | LOS A | 0.195            | 0.000     | LOS A |
|                   |                       | Right Turn | 0.187      | 2.300     | LOS A | 0.195            | 2.300     | LOS A |
|                   |                       | Approach   | 0.187      | 0.000     | NA    | 0.195            | 0.000     | NA    |
|                   | Site Access 1 (N)     | Left Turn  | 0.002      | 4.400     | LOS A | 0.002            | 4.400     | LOS A |
|                   |                       | Through    | 0.002      | 6.200     | LOS A | 0.002            | 6.400     | LOS A |
|                   |                       | Approach   | 0.002      | 5.300     | LOS A | 0.002            | 5.400     | LOS A |
|                   | Yolanda Drive (W)     | Left Turn  | 0.146      | 5.200     | LOS A | 0.153            | 5.200     | LOS A |
|                   |                       | Through    | 0.146      | 0.000     | LOS A | 0.153            | 0.000     | LOS A |
|                   |                       | Approach   | 0.146      | 0.000     | NA    | 0.153            | 0.000     | NA    |
|                   | Overall               |            | 0.187      | 0.000     | NA    | 0.195            | 0.000     | NA    |
| 103               | Yolanda Drive (E)     | Through    | 0.220      | 0.200     | LOS A | 0.238            | 0.200     | LOS A |
|                   |                       | Right Turn | 0.220      | 4.300     | LOS A | 0.238            | 4.400     | LOS A |
|                   |                       | Approach   | 0.220      | 0.700     | NA    | 0.238            | 0.800     | NA    |
|                   | Yolanda Drive (W)     | Left Turn  | 0.147      | 2.500     | LOS A | 0.153            | 2.500     | LOS A |
|                   |                       | Through    | 0.147      | 0.000     | LOS A | 0.153            | 0.000     | LOS A |
|                   |                       | Approach   | 0.147      | 0.600     | NA    | 0.153            | 0.700     | NA    |
|                   | Overall               |            | 0.220      | 0.600     | NA    | 0.238            | 0.700     | NA    |
| 104               | Yolanda Drive (E)     | Through    | 0.175      | 0.000     | LOS A | 0.182            | 0.000     | LOS A |
|                   |                       | Approach   | 0.175      | 0.000     | NA    | 0.182            | 0.000     | NA    |
|                   | Site Access 3 (N)     | Left Turn  | 0.033      | 4.700     | LOS A | 0.040            | 4.700     | LOS A |
|                   |                       | Through    | 0.075      | 6.700     | LOS A | 0.109            | 6.900     | LOS A |
|                   |                       | Approach   | 0.075      | 5.800     | LOS A | 0.109            | 6.000     | LOS A |
|                   | Yolanda Drive (W)     | Through    | 0.111      | 0.000     | LOS A | 0.111            | 0.000     | LOS A |
|                   |                       | Approach   | 0.111      | 0.000     | NA    | 0.111            | 0.000     | NA    |
|                   | Overall               |            | 0.175      | 0.900     | NA    | 0.182            | 1.200     | NA    |
| 105               | Honeysuckle Drive (S) | Left Turn  | 0.002      | 6.600     | LOS A | 0.002            | 6.600     | LOS A |
|                   |                       | Right Turn | 0.002      | 7.900     | LOS A | 0.002            | 8.100     | LOS A |
|                   |                       | Approach   | 0.002      | 7.300     | LOS A | 0.002            | 7.300     | LOS A |
|                   | Yolanda Drive (E)     | Left Turn  | 0.175      | 2.700     | LOS A | 0.182            | 2.700     | LOS A |
|                   |                       | Through    | 0.175      | 0.000     | LOS A | 0.182            | 0.000     | LOS A |
|                   |                       | Approach   | 0.175      | 0.000     | NA    | 0.182            | 0.000     | NA    |
|                   | Yolanda Drive (W)     | Through    | 0.135      | 0.000     | LOS A | 0.140            | 0.000     | LOS A |
|                   |                       | Right Turn | 0.135      | 2.500     | LOS A | 0.140            | 2.500     | LOS A |
|                   |                       | Approach   | 0.135      | 0.000     | NA    | 0.140            | 0.000     | NA    |
|                   | Overall               |            | 0.175      | 0.000     | NA    | 0.182            | 0.000     | NA    |

**Table 11.** 2027 PM peak hour background and with development movement summary (continued)

| 2027 PM Peak Hour |                                   |            |            |           |       |                  |           |       |
|-------------------|-----------------------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach                          | Movement   | Background |           |       | With development |           |       |
|                   |                                   |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 106               | Yolanda Drive (E)                 | Through    | 0.180      | 0.100     | LOS A | 0.186            | 0.100     | LOS A |
|                   |                                   | Right Turn | 0.180      | 6.100     | LOS A | 0.186            | 6.100     | LOS A |
|                   |                                   | Approach   | 0.180      | 0.300     | NA    | 0.186            | 0.300     | NA    |
|                   | Site Access 4 (N)                 | Left Turn  | 0.042      | 4.700     | LOS A | 0.054            | 4.700     | LOS A |
|                   |                                   | Right Turn | 0.042      | 6.500     | LOS A | 0.054            | 6.700     | LOS A |
|                   |                                   | Approach   | 0.042      | 5.200     | LOS A | 0.054            | 5.300     | LOS A |
|                   | Yolanda Drive (W)                 | Left Turn  | 0.135      | 2.700     | LOS A | 0.139            | 2.700     | LOS A |
|                   |                                   | Through    | 0.135      | 0.000     | LOS A | 0.139            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.135      | 0.100     | NA    | 0.139            | 0.100     | NA    |
|                   | Overall                           |            | 0.180      | 0.600     | NA    | 0.186            | 0.700     | NA    |
| 201               | Cypress Drive (S)                 | Through    | 0.065      | 0.000     | LOS A | 0.071            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.065      | 3.400     | LOS A | 0.071            | 3.500     | LOS A |
|                   |                                   | Approach   | 0.065      | 0.400     | NA    | 0.071            | 0.400     | NA    |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.058      | 5.000     | LOS A | 0.074            | 5.000     | LOS A |
|                   |                                   | Right      | 0.058      | 5.400     | LOS A | 0.074            | 5.500     | LOS A |
|                   |                                   | Approach   | 0.058      | 5.100     | LOS A | 0.074            | 5.200     | LOS A |
|                   | Cypress Drive (N)                 | Left Turn  | 0.044      | 3.700     | LOS A | 0.045            | 3.700     | LOS A |
|                   |                                   | Through    | 0.044      | 0.000     | LOS A | 0.045            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.044      | 0.500     | NA    | 0.045            | 0.500     | NA    |
|                   | Overall                           |            | 0.065      | 1.700     | NA    | 0.074            | 1.900     | NA    |
| 202               | Site Access 5 (S)                 | Left Turn  | 0.004      | 2.900     | LOS A | 0.004            | 2.900     | LOS A |
|                   |                                   | Right Turn | 0.004      | 3.000     | LOS A | 0.004            | 3.000     | LOS A |
|                   |                                   | Approach   | 0.004      | 2.900     | LOS A | 0.004            | 2.900     | LOS A |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.035      | 3.500     | LOS A | 0.041            | 3.500     | LOS A |
|                   |                                   | Through    | 0.035      | 0.000     | LOS A | 0.041            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.035      | 0.100     | NA    | 0.041            | 0.000     | NA    |
|                   | Jonquil Crescent (W)              | Through    | 0.012      | 0.000     | LOS A | 0.014            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.012      | 4.800     | LOS A | 0.014            | 4.800     | LOS A |
|                   |                                   | Approach   | 0.012      | 0.200     | NA    | 0.014            | 0.200     | NA    |
|                   | Overall                           |            | 0.035      | 0.300     | NA    | 0.041            | 0.200     | NA    |
| 203               | Site Access 6 (S)                 | Left Turn  | 0.002      | 2.600     | LOS A | 0.002            | 2.600     | LOS A |
|                   |                                   | Right Turn | 0.002      | 2.600     | LOS A | 0.002            | 2.700     | LOS A |
|                   |                                   | Approach   | 0.002      | 2.600     | LOS A | 0.002            | 2.700     | LOS A |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.025      | 3.400     | LOS A | 0.030            | 3.400     | LOS A |
|                   |                                   | Through    | 0.025      | 0.000     | LOS A | 0.030            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.025      | 0.100     | NA    | 0.030            | 0.100     | NA    |
|                   | Jonquil Crescent (W)              | Through    | 0.006      | 0.000     | LOS A | 0.006            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.006      | 3.600     | LOS A | 0.006            | 3.600     | LOS A |
|                   |                                   | Approach   | 0.006      | 0.300     | NA    | 0.006            | 0.300     | NA    |
|                   | Overall                           |            | 0.025      | 0.200     | NA    | 0.030            | 0.200     | NA    |
| 204               | Jonquil Crescent (S)              | Left Turn  | 0.006      | 3.400     | LOS A | 0.006            | 3.400     | LOS A |
|                   |                                   | Right Turn | 0.006      | 3.300     | LOS A | 0.006            | 3.300     | LOS A |
|                   |                                   | Approach   | 0.006      | 3.400     | NA    | 0.006            | 3.400     | NA    |
|                   | Jonquil Crescent (Cul-de-sac) (E) | Left Turn  | 0.002      | 2.600     | LOS A | 0.002            | 2.600     | LOS A |
|                   |                                   | Through    | 0.002      | 1.600     | LOS A | 0.002            | 1.700     | LOS A |
|                   |                                   | Approach   | 0.002      | 2.100     | LOS A | 0.002            | 2.100     | LOS A |
|                   | Jonquil Crescent (W)              | Through    | 0.029      | 0.000     | LOS A | 0.035            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.029      | 5.500     | LOS A | 0.035            | 5.500     | LOS A |
|                   |                                   | Approach   | 0.029      | 5.400     | NA    | 0.035            | 5.400     | NA    |
|                   | Overall                           |            | 0.029      | 4.900     | NA    | 0.035            | 5.000     | NA    |

**Table 11.** 2027 PM peak hour background and with development movement summary (continued)

| 2027 PM Peak Hour |                      |            |            |           |       |                  |           |       |
|-------------------|----------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach             | Movement   | Background |           |       | With development |           |       |
|                   |                      |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 205               | Cypress Drive (S)    | Through    | 0.077      | 0.100     | LOS A | 0.088            | 0.100     | LOS A |
|                   |                      | Right Turn | 0.077      | 3.900     | LOS A | 0.088            | 3.900     | LOS A |
|                   |                      | Approach   | 0.077      | 1.200     | NA    | 0.088            | 1.200     | NA    |
|                   | Jonquil Crescent (E) | Left Turn  | 0.011      | 5.800     | LOS A | 0.012            | 5.800     | LOS A |
|                   |                      | Right Turn | 0.011      | 6.200     | LOS A | 0.012            | 6.300     | LOS A |
|                   |                      | Approach   | 0.011      | 5.900     | LOS A | 0.012            | 6.000     | LOS A |
|                   | Cypress Drive (N)    | Left Turn  | 0.058      | 5.100     | LOS A | 0.061            | 5.100     | LOS A |
|                   |                      | Through    | 0.058      | 0.000     | LOS A | 0.061            | 0.000     | LOS A |
|                   |                      | Approach   | 0.058      | 1.200     | NA    | 0.061            | 1.300     | NA    |
|                   | Overall              |            | 0.077      | 1.400     | NA    | 0.088            | 1.500     | NA    |

As presented in **Table 9** and **10**, the 2027 AM and PM peak hour results confirm that the LOS remains within the LOS A and LOS B range during the background and with development scenarios. Additionally, the Degree of Saturation for all the intersections during both the 2027 AM and PM background and with development scenario remain below 0.8 (80%), indicating that the intersection will not be saturated. As such, the proposed development is not anticipated to have a significant impact on existing road network operation.

### 8.3.2 10-years Horizon (2037) SIDRA results

The background and with development movement summary results for the 10-years horizon (2037) AM and PM has been summarised in **Tables 11** and **12** respectively. Refer to **Appendix B** for SIDRA movement reports.

**Table 11.** 2037 AM peak hour background and with development movement summary

| 2037 AM Peak Hour |                       |            |            |           |       |                  |           |       |
|-------------------|-----------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach              | Movement   | Background |           |       | With development |           |       |
|                   |                       |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 101               | Oleander Street (S)   | Left Turn  | 0.186      | 8.000     | LOS A | 0.191            | 8.000     | LOS A |
|                   |                       | Right Turn | 0.186      | 13.700    | LOS B | 0.191            | 14.200    | LOS B |
|                   |                       | Approach   | 0.186      | 9.700     | LOS A | 0.191            | 9.900     | LOS A |
|                   | Yolanda Drive (E)     | Left Turn  | 0.326      | 5.200     | LOS A | 0.331            | 5.200     | LOS A |
|                   |                       | Through    | 0.326      | 0.000     | LOS A | 0.331            | 0.000     | LOS A |
|                   |                       | Approach   | 0.326      | 0.800     | NA    | 0.331            | 0.800     | NA    |
|                   | Yolanda Drive (W)     | Through    | 0.279      | 0.800     | LOS A | 0.288            | 0.800     | LOS A |
|                   |                       | Right Turn | 0.279      | 8.700     | LOS A | 0.288            | 8.800     | LOS A |
|                   |                       | Approach   | 0.279      | 1.900     | NA    | 0.288            | 1.900     | NA    |
|                   | Overall               |            | 0.326      | 2.100     | NA    | 0.331            | 2.100     | NA    |
| 102               | Yolanda Drive (E)     | Through    | 0.335      | 0.000     | LOS A | 0.340            | 0.000     | LOS A |
|                   |                       | Right Turn | 0.335      | 2.400     | LOS A | 0.340            | 2.400     | LOS A |
|                   |                       | Approach   | 0.335      | 0.000     | NA    | 0.340            | 0.000     | NA    |
|                   | Site Access 1 (N)     | Left Turn  | 0.004      | 5.000     | LOS A | 0.004            | 5.000     | LOS A |
|                   |                       | Through    | 0.004      | 10.500    | LOS B | 0.004            | 10.900    | LOS B |
|                   |                       | Approach   | 0.004      | 7.800     | LOS A | 0.004            | 8.000     | LOS A |
|                   | Yolanda Drive (W)     | Left Turn  | 0.224      | 5.200     | LOS A | 0.232            | 5.200     | LOS A |
|                   |                       | Through    | 0.224      | 0.000     | LOS A | 0.232            | 0.000     | LOS A |
|                   |                       | Approach   | 0.224      | 0.000     | NA    | 0.232            | 0.000     | NA    |
|                   | Overall               |            | 0.335      | 0.000     | NA    | 0.340            | 0.000     | NA    |
| 103               | Yolanda Drive (E)     | Through    | 0.393      | 0.400     | LOS A | 0.407            | 0.500     | LOS A |
|                   |                       | Right Turn | 0.393      | 5.400     | LOS A | 0.407            | 5.600     | LOS A |
|                   |                       | Approach   | 0.393      | 0.800     | NA    | 0.407            | 1.000     | NA    |
|                   | Yolanda Drive (W)     | Left Turn  | 0.225      | 2.500     | LOS A | 0.233            | 2.500     | LOS A |
|                   |                       | Through    | 0.225      | 0.000     | LOS A | 0.233            | 0.000     | LOS A |
|                   |                       | Approach   | 0.225      | 0.600     | NA    | 0.233            | 0.600     | NA    |
|                   | Overall               |            | 0.393      | 0.700     | NA    | 0.407            | 0.800     | NA    |
| 104               | Yolanda Drive (E)     | Through    | 0.317      | 0.000     | LOS A | 0.321            | 0.000     | LOS A |
|                   |                       | Approach   | 0.317      | 0.000     | NA    | 0.321            | 0.000     | NA    |
|                   | Site Access 3 (N)     | Left Turn  | 0.054      | 5.200     | LOS A | 0.061            | 5.200     | LOS A |
|                   |                       | Through    | 0.220      | 11.000    | LOS B | 0.248            | 11.400    | LOS B |
|                   |                       | Approach   | 0.220      | 8.700     | LOS A | 0.248            | 9.000     | LOS A |
|                   | Yolanda Drive (W)     | Through    | 0.172      | 0.000     | LOS A | 0.176            | 0.000     | LOS A |
|                   |                       | Approach   | 0.172      | 0.000     | NA    | 0.176            | 0.000     | NA    |
|                   | Overall               |            | 0.317      | 1.300     | NA    | 0.321            | 1.500     | NA    |
| 105               | Honeysuckle Drive (S) | Left Turn  | 0.044      | 8.000     | LOS A | 0.045            | 8.100     | LOS A |
|                   |                       | Right Turn | 0.044      | 12.100    | LOS B | 0.045            | 12.400    | LOS B |
|                   |                       | Approach   | 0.044      | 9.800     | LOS A | 0.045            | 10.000    | LOS A |
|                   | Yolanda Drive (E)     | Left Turn  | 0.315      | 2.700     | LOS A | 0.319            | 2.700     | LOS A |
|                   |                       | Through    | 0.315      | 0.000     | LOS A | 0.319            | 0.000     | LOS A |
|                   |                       | Approach   | 0.315      | 0.100     | NA    | 0.319            | 0.100     | NA    |
|                   | Yolanda Drive (W)     | Through    | 0.216      | 0.100     | LOS A | 0.223            | 0.100     | LOS A |
|                   |                       | Right Turn | 0.216      | 5.300     | LOS A | 0.223            | 5.400     | LOS A |
|                   |                       | Approach   | 0.216      | 0.200     | NA    | 0.223            | 0.200     | NA    |
|                   | Overall               |            | 0.315      | 0.400     | NA    | 0.319            | 0.400     | NA    |

**Table 12.** 2037 AM peak hour background and with development movement summary (continued)

| 2037 AM Peak Hour |                                   |            |            |           |       |                  |           |       |
|-------------------|-----------------------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach                          | Movement   | Background |           |       | With development |           |       |
|                   |                                   |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 106               | Yolanda Drive (E)                 | Through    | 0.346      | 0.200     | LOS A | 0.362            | 0.300     | LOS A |
|                   |                                   | Right Turn | 0.346      | 7.100     | LOS A | 0.362            | 7.200     | LOS A |
|                   |                                   | Approach   | 0.346      | 0.600     | NA    | 0.362            | 0.800     | NA    |
|                   | Site Access 4 (N)                 | Left Turn  | 0.028      | 5.200     | LOS A | 0.029            | 5.200     | LOS A |
|                   |                                   | Right Turn | 0.028      | 10.900    | LOS B | 0.029            | 11.400    | LOS B |
|                   |                                   | Approach   | 0.028      | 6.500     | LOS A | 0.029            | 6.700     | LOS A |
|                   | Yolanda Drive (W)                 | Left Turn  | 0.213      | 2.700     | LOS A | 0.220            | 2.700     | LOS A |
|                   |                                   | Through    | 0.213      | 0.000     | LOS A | 0.220            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.213      | 0.100     | NA    | 0.220            | 0.200     | NA    |
|                   | Overall                           |            | 0.346      | 0.600     | NA    | 0.362            | 0.700     | NA    |
| 201               | Cypress Drive (S)                 | Through    | 0.056      | 0.100     | LOS A | 0.058            | 0.100     | LOS A |
|                   |                                   | Right Turn | 0.056      | 3.800     | LOS A | 0.058            | 3.800     | LOS A |
|                   |                                   | Approach   | 0.056      | 0.500     | NA    | 0.058            | 0.500     | NA    |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.102      | 5.200     | LOS A | 0.111            | 5.200     | LOS A |
|                   |                                   | Right      | 0.102      | 5.700     | LOS A | 0.111            | 5.700     | LOS A |
|                   |                                   | Approach   | 0.102      | 5.400     | LOS A | 0.111            | 5.400     | LOS A |
|                   | Cypress Drive (N)                 | Left Turn  | 0.087      | 3.700     | LOS A | 0.088            | 3.700     | LOS A |
|                   |                                   | Through    | 0.087      | 0.000     | LOS A | 0.088            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.087      | 0.700     | NA    | 0.088            | 0.700     | NA    |
|                   | Overall                           |            | 0.102      | 2.100     | NA    | 0.111            | 2.200     | NA    |
| 202               | Site Access 5 (S)                 | Left Turn  | 0.002      | 3.000     | LOS A | 0.002            | 3.000     | LOS A |
|                   |                                   | Right Turn | 0.002      | 3.200     | LOS A | 0.002            | 3.200     | LOS A |
|                   |                                   | Approach   | 0.002      | 3.100     | LOS A | 0.002            | 3.100     | LOS A |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.060      | 3.500     | LOS A | 0.065            | 3.500     | LOS A |
|                   |                                   | Through    | 0.060      | 0.000     | LOS A | 0.065            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.060      | 0.100     | NA    | 0.065            | 0.100     | NA    |
|                   | Jonquil Crescent (W)              | Through    | 0.021      | 0.100     | LOS A | 0.023            | 0.100     | LOS A |
|                   |                                   | Right Turn | 0.021      | 5.100     | LOS A | 0.023            | 5.100     | LOS A |
|                   |                                   | Approach   | 0.021      | 1.100     | NA    | 0.023            | 1.000     | NA    |
|                   | Overall                           |            | 0.060      | 0.400     | NA    | 0.065            | 0.300     | NA    |
| 203               | Site Access 6 (S)                 | Left Turn  | 0.002      | 2.800     | LOS A | 0.002            | 2.800     | LOS A |
|                   |                                   | Right Turn | 0.002      | 2.800     | LOS A | 0.002            | 2.800     | LOS A |
|                   |                                   | Approach   | 0.002      | 2.800     | LOS A | 0.002            | 2.800     | LOS A |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.051      | 3.400     | LOS A | 0.055            | 3.400     | LOS A |
|                   |                                   | Through    | 0.051      | 0.000     | LOS A | 0.055            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.051      | 0.000     | NA    | 0.055            | 0.000     | NA    |
|                   | Jonquil Crescent (W)              | Through    | 0.005      | 0.000     | LOS A | 0.005            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.005      | 3.800     | LOS A | 0.005            | 3.800     | LOS A |
|                   |                                   | Approach   | 0.005      | 0.500     | NA    | 0.005            | 0.400     | NA    |
|                   | Overall                           |            | 0.051      | 0.100     | NA    | 0.055            | 0.100     | NA    |
| 204               | Jonquil Crescent (S)              | Left Turn  | 0.004      | 3.400     | LOS A | 0.005            | 3.400     | LOS A |
|                   |                                   | Right Turn | 0.004      | 3.300     | LOS A | 0.005            | 3.300     | LOS A |
|                   |                                   | Approach   | 0.004      | 3.400     | NA    | 0.005            | 3.400     | NA    |
|                   | Jonquil Crescent (Cul-de-sac) (E) | Left Turn  | 0.002      | 2.700     | LOS A | 0.002            | 2.800     | LOS A |
|                   |                                   | Through    | 0.002      | 1.800     | LOS A | 0.002            | 1.800     | LOS A |
|                   |                                   | Approach   | 0.002      | 2.300     | LOS A | 0.002            | 2.300     | LOS A |
|                   | Jonquil Crescent (W)              | Through    | 0.055      | 0.000     | LOS A | 0.064            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.055      | 5.500     | LOS A | 0.064            | 5.500     | LOS A |
|                   |                                   | Approach   | 0.055      | 5.400     | NA    | 0.064            | 5.400     | NA    |
|                   | Overall                           |            | 0.055      | 5.200     | NA    | 0.064            | 5.200     | NA    |



**Table 12.** 2037 AM peak hour background and with development movement summary (continued)

| 2037 AM Peak Hour |                      |            |            |           |       |                  |           |       |
|-------------------|----------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach             | Movement   | Background |           |       | With development |           |       |
|                   |                      |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 205               | Cypress Drive (S)    | Through    | 0.085      | 0.300     | LOS A | 0.094            | 0.300     | LOS A |
|                   |                      | Right Turn | 0.085      | 4.400     | LOS A | 0.094            | 4.400     | LOS A |
|                   |                      | Approach   | 0.085      | 1.500     | NA    | 0.094            | 1.500     | NA    |
|                   | Jonquil Crescent (E) | Left Turn  | 0.018      | 6.000     | LOS A | 0.019            | 6.000     | LOS A |
|                   |                      | Right Turn | 0.018      | 6.700     | LOS A | 0.019            | 6.800     | LOS A |
|                   |                      | Approach   | 0.018      | 6.300     | LOS A | 0.019            | 6.400     | LOS A |
|                   | Cypress Drive (N)    | Left Turn  | 0.122      | 5.100     | LOS A | 0.126            | 5.100     | LOS A |
|                   |                      | Through    | 0.122      | 0.000     | LOS A | 0.126            | 0.000     | LOS A |
|                   |                      | Approach   | 0.122      | 1.400     | NA    | 0.126            | 1.500     | NA    |
|                   | Overall              |            | 0.122      | 1.700     | NA    | 0.126            | 1.700     | NA    |

**Table 12.** 2037 PM peak hour background and with development movement summary

| 2037 PM Peak Hour |                       |            |            |           |       |                  |           |       |
|-------------------|-----------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach              | Movement   | Background |           |       | With development |           |       |
|                   |                       |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 101               | Oleander Street (S)   | Left Turn  | 0.103      | 7.000     | LOS A | 0.105            | 7.100     | LOS A |
|                   |                       | Right Turn | 0.103      | 9.800     | LOS A | 0.105            | 10.100    | LOS B |
|                   |                       | Approach   | 0.103      | 7.800     | LOS A | 0.105            | 7.900     | LOS A |
|                   | Yolanda Drive (E)     | Left Turn  | 0.214      | 5.200     | LOS A | 0.223            | 5.200     | LOS A |
|                   |                       | Through    | 0.214      | 0.000     | LOS A | 0.223            | 0.000     | LOS A |
|                   |                       | Approach   | 0.214      | 0.400     | NA    | 0.223            | 0.400     | NA    |
|                   | Yolanda Drive (W)     | Through    | 0.206      | 0.500     | LOS A | 0.213            | 0.500     | LOS A |
|                   |                       | Right Turn | 0.206      | 7.200     | LOS A | 0.213            | 7.300     | LOS A |
|                   |                       | Approach   | 0.206      | 1.800     | NA    | 0.213            | 1.800     | NA    |
|                   | Overall               |            | 0.214      | 1.700     | NA    | 0.223            | 1.700     | NA    |
| 102               | Yolanda Drive (E)     | Through    | 0.205      | 0.000     | LOS A | 0.214            | 0.000     | LOS A |
|                   |                       | Right Turn | 0.205      | 2.300     | LOS A | 0.214            | 2.300     | LOS A |
|                   |                       | Approach   | 0.205      | 0.000     | NA    | 0.214            | 0.000     | NA    |
|                   | Site Access 1 (N)     | Left Turn  | 0.002      | 4.500     | LOS A | 0.003            | 4.500     | LOS A |
|                   |                       | Through    | 0.002      | 6.600     | LOS A | 0.003            | 6.800     | LOS A |
|                   |                       | Approach   | 0.002      | 5.500     | LOS A | 0.003            | 5.700     | LOS A |
|                   | Yolanda Drive (W)     | Left Turn  | 0.161      | 5.200     | LOS A | 0.167            | 5.200     | LOS A |
|                   |                       | Through    | 0.161      | 0.000     | LOS A | 0.167            | 0.000     | LOS A |
|                   |                       | Approach   | 0.161      | 0.000     | NA    | 0.167            | 0.000     | NA    |
|                   | Overall               |            | 0.205      | 0.000     | NA    | 0.214            | 0.000     | NA    |
| 103               | Yolanda Drive (E)     | Through    | 0.243      | 0.200     | LOS A | 0.260            | 0.300     | LOS A |
|                   |                       | Right Turn | 0.243      | 4.400     | LOS A | 0.260            | 4.500     | LOS A |
|                   |                       | Approach   | 0.243      | 0.700     | NA    | 0.260            | 0.800     | NA    |
|                   | Yolanda Drive (W)     | Left Turn  | 0.161      | 2.500     | LOS A | 0.167            | 2.500     | LOS A |
|                   |                       | Through    | 0.161      | 0.000     | LOS A | 0.167            | 0.000     | LOS A |
|                   |                       | Approach   | 0.161      | 0.600     | NA    | 0.167            | 0.700     | NA    |
|                   | Overall               |            | 0.243      | 0.700     | NA    | 0.260            | 0.800     | NA    |
| 104               | Yolanda Drive (E)     | Through    | 0.192      | 0.000     | LOS A | 0.200            | 0.000     | LOS A |
|                   |                       | Approach   | 0.192      | 0.000     | NA    | 0.200            | 0.000     | NA    |
|                   | Site Access 3 (N)     | Left Turn  | 0.036      | 4.800     | LOS A | 0.044            | 4.800     | LOS A |
|                   |                       | Through    | 0.103      | 7.100     | LOS A | 0.124            | 7.300     | LOS A |
|                   |                       | Approach   | 0.103      | 6.200     | LOS A | 0.124            | 6.300     | LOS A |
|                   | Yolanda Drive (W)     | Through    | 0.122      | 0.000     | LOS A | 0.122            | 0.000     | LOS A |
|                   |                       | Approach   | 0.122      | 0.000     | NA    | 0.122            | 0.000     | NA    |
|                   | Overall               |            | 0.192      | 1.100     | NA    | 0.200            | 1.200     | NA    |
| 105               | Honeysuckle Drive (S) | Left Turn  | 0.002      | 6.700     | LOS A | 0.003            | 6.800     | LOS A |
|                   |                       | Right Turn | 0.002      | 8.300     | LOS A | 0.003            | 8.500     | LOS A |
|                   |                       | Approach   | 0.002      | 7.500     | LOS A | 0.003            | 7.600     | LOS A |
|                   | Yolanda Drive (E)     | Left Turn  | 0.192      | 2.700     | LOS A | 0.200            | 2.700     | LOS A |
|                   |                       | Through    | 0.192      | 0.000     | LOS A | 0.200            | 0.000     | LOS A |
|                   |                       | Approach   | 0.192      | 0.000     | NA    | 0.200            | 0.000     | NA    |
|                   | Yolanda Drive (W)     | Through    | 0.149      | 0.000     | LOS A | 0.153            | 0.000     | LOS A |
|                   |                       | Right Turn | 0.149      | 2.500     | LOS A | 0.153            | 2.500     | LOS A |
|                   |                       | Approach   | 0.149      | 0.000     | NA    | 0.153            | 0.000     | NA    |
|                   | Overall               |            | 0.192      | 0.000     | NA    | 0.200            | 0.000     | NA    |

**Table 13.** 2037 PM peak hour background and with development movement summary (continued)

| 2037 PM Peak Hour |                                   |            |            |           |       |                  |           |       |
|-------------------|-----------------------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach                          | Movement   | Background |           |       | With development |           |       |
|                   |                                   |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 106               | Yolanda Drive (E)                 | Through    | 0.198      | 0.100     | LOS A | 0.203            | 0.100     | LOS A |
|                   |                                   | Right Turn | 0.198      | 6.200     | LOS A | 0.203            | 6.300     | LOS A |
|                   |                                   | Approach   | 0.198      | 0.400     | NA    | 0.203            | 0.400     | NA    |
|                   | Site Access 4 (N)                 | Left Turn  | 0.050      | 4.800     | LOS A | 0.062            | 4.800     | LOS A |
|                   |                                   | Right Turn | 0.050      | 6.900     | LOS A | 0.062            | 7.100     | LOS A |
|                   |                                   | Approach   | 0.050      | 5.400     | LOS A | 0.062            | 5.500     | LOS A |
|                   | Yolanda Drive (W)                 | Left Turn  | 0.148      | 2.700     | LOS A | 0.152            | 2.700     | LOS A |
|                   |                                   | Through    | 0.148      | 0.000     | LOS A | 0.152            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.148      | 0.100     | NA    | 0.152            | 0.100     | NA    |
|                   | Overall                           |            | 0.198      | 0.600     | NA    | 0.203            | 0.700     | NA    |
| 201               | Cypress Drive (S)                 | Through    | 0.072      | 0.000     | LOS A | 0.077            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.072      | 3.500     | LOS A | 0.077            | 3.500     | LOS A |
|                   |                                   | Approach   | 0.072      | 0.400     | NA    | 0.077            | 0.500     | NA    |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.065      | 5.000     | LOS A | 0.076            | 5.000     | LOS A |
|                   |                                   | Right      | 0.065      | 5.500     | LOS A | 0.076            | 5.600     | LOS A |
|                   |                                   | Approach   | 0.065      | 5.200     | LOS A | 0.076            | 5.200     | LOS A |
|                   | Cypress Drive (N)                 | Left Turn  | 0.048      | 3.700     | LOS A | 0.050            | 3.700     | LOS A |
|                   |                                   | Through    | 0.048      | 0.000     | LOS A | 0.050            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.048      | 0.500     | NA    | 0.050            | 0.500     | NA    |
|                   | Overall                           |            | 0.072      | 1.700     | NA    | 0.077            | 1.900     | NA    |
| 202               | Site Access 5 (S)                 | Left Turn  | 0.004      | 2.900     | LOS A | 0.004            | 2.900     | LOS A |
|                   |                                   | Right Turn | 0.004      | 3.000     | LOS A | 0.004            | 3.100     | LOS A |
|                   |                                   | Approach   | 0.004      | 2.900     | LOS A | 0.004            | 2.900     | LOS A |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.038      | 3.500     | LOS A | 0.045            | 3.500     | LOS A |
|                   |                                   | Through    | 0.038      | 0.000     | LOS A | 0.045            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.038      | 0.000     | NA    | 0.045            | 0.000     | NA    |
|                   | Jonquil Crescent (W)              | Through    | 0.013      | 0.000     | LOS A | 0.015            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.013      | 4.800     | LOS A | 0.015            | 4.800     | LOS A |
|                   |                                   | Approach   | 0.013      | 0.200     | NA    | 0.015            | 0.200     | NA    |
|                   | Overall                           |            | 0.038      | 0.200     | NA    | 0.045            | 0.200     | NA    |
| 203               | Site Access 6 (S)                 | Left Turn  | 0.002      | 2.600     | LOS A | 0.002            | 2.600     | LOS A |
|                   |                                   | Right Turn | 0.002      | 2.700     | LOS A | 0.002            | 2.700     | LOS A |
|                   |                                   | Approach   | 0.002      | 2.600     | LOS A | 0.002            | 2.700     | LOS A |
|                   | Jonquil Crescent (E)              | Left Turn  | 0.027      | 3.400     | LOS A | 0.033            | 3.400     | LOS A |
|                   |                                   | Through    | 0.027      | 0.000     | LOS A | 0.033            | 0.000     | LOS A |
|                   |                                   | Approach   | 0.027      | 0.100     | NA    | 0.033            | 0.100     | NA    |
|                   | Jonquil Crescent (W)              | Through    | 0.006      | 0.000     | LOS A | 0.007            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.006      | 3.600     | LOS A | 0.007            | 3.600     | LOS A |
|                   |                                   | Approach   | 0.006      | 0.300     | NA    | 0.007            | 0.300     | NA    |
|                   | Overall                           |            | 0.027      | 0.200     | NA    | 0.033            | 0.200     | NA    |
| 204               | Jonquil Crescent (S)              | Left Turn  | 0.006      | 3.400     | LOS A | 0.007            | 3.400     | LOS A |
|                   |                                   | Right Turn | 0.006      | 3.300     | LOS A | 0.007            | 3.300     | LOS A |
|                   |                                   | Approach   | 0.006      | 3.400     | NA    | 0.007            | 3.400     | NA    |
|                   | Jonquil Crescent (Cul-de-sac) (E) | Left Turn  | 0.002      | 2.600     | LOS A | 0.002            | 2.600     | LOS A |
|                   |                                   | Through    | 0.002      | 1.600     | LOS A | 0.002            | 1.700     | LOS A |
|                   |                                   | Approach   | 0.002      | 2.100     | LOS A | 0.002            | 2.200     | LOS A |
|                   | Jonquil Crescent (W)              | Through    | 0.029      | 0.000     | LOS A | 0.037            | 0.000     | LOS A |
|                   |                                   | Right Turn | 0.029      | 5.500     | LOS A | 0.037            | 5.500     | LOS A |
|                   |                                   | Approach   | 0.029      | 5.400     | NA    | 0.037            | 5.400     | NA    |
|                   | Overall                           |            | 0.029      | 4.900     | NA    | 0.037            | 5.000     | NA    |

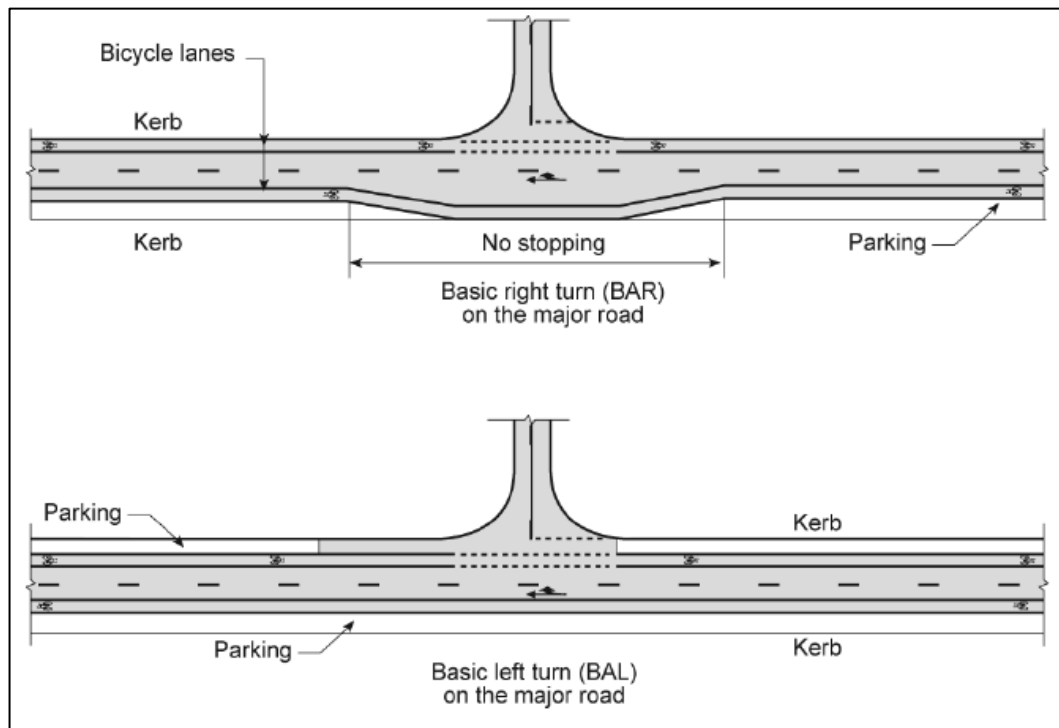
**Table 13.** 2037 PM peak hour background and with development movement summary (continued)

| 2037 PM Peak Hour |                      |            |            |           |       |                  |           |       |
|-------------------|----------------------|------------|------------|-----------|-------|------------------|-----------|-------|
| Site No.          | Approach             | Movement   | Background |           |       | With development |           |       |
|                   |                      |            | DoS        | Delay (s) | LOS   | DoS              | Delay (s) | LOS   |
| 205               | Cypress Drive (S)    | Through    | 0.085      | 0.100     | LOS A | 0.096            | 0.100     | LOS A |
|                   |                      | Right Turn | 0.085      | 3.900     | LOS A | 0.096            | 4.000     | LOS A |
|                   |                      | Approach   | 0.085      | 1.200     | NA    | 0.096            | 1.200     | NA    |
|                   | Jonquil Crescent (E) | Left Turn  | 0.013      | 5.800     | LOS A | 0.014            | 5.800     | LOS A |
|                   |                      | Right Turn | 0.013      | 6.300     | LOS A | 0.014            | 6.400     | LOS A |
|                   |                      | Approach   | 0.013      | 6.000     | LOS A | 0.014            | 6.100     | LOS A |
|                   | Cypress Drive (N)    | Left Turn  | 0.063      | 5.100     | LOS A | 0.067            | 5.100     | LOS A |
|                   |                      | Through    | 0.063      | 0.000     | LOS A | 0.067            | 0.000     | LOS A |
|                   |                      | Approach   | 0.063      | 1.200     | NA    | 0.067            | 1.300     | NA    |
|                   | Overall              |            | 0.085      | 1.400     | NA    | 0.096            | 1.500     | NA    |

As shown from the tables above, the 2037 AM and PM peak hour results indicate that the LOS remains within the LOS A and LOS B range under the background and with development scenarios. Additionally, the Degree of Saturation (DOS) for all the intersections during both the 2037 AM and PM during the background and with development scenarios remain below 0.8 (80%), indicating that the intersections will not be over saturated. As such, the proposed development is not anticipated to have a significant impact on existing road network operation.

## 9.0 TURN WARRANT ASSESSMENT

The minimum turn treatment for new intersections is a Basic Right (BAR) and Basic Left (BAL) arrangement, whilst this is noted the existing intersections are Simple Right (SR) and Simple Left (SL) arrangements. Example of an urban BAR and BAL are shown in **Figure 71**.



**Figure 71.** Urban BAR and BAL treatment (Source: AGTM Part 6, Figure 3.2)

### 9.1.1.1 Basic Right (BAR) turn treatment

An urban BAL on a two-lane, two-way road generally only consists of no obstructions on the upstream approach to the intersection. No set dimensions are provided in Austroads. Parking should be restricted to not limit the sight distance to or from the intersection.

Based on the sight distance it is advised that no parking signage and yellow line marking is provided upstream of the site accesses to restrict parking in these areas. Proposed areas and distances to be marked are provided in **Appendix C**.

#### 9.1.1.2 Right turn treatment provision

The following is noted with regards to the subject site with respects to provision of a right turn treatment:

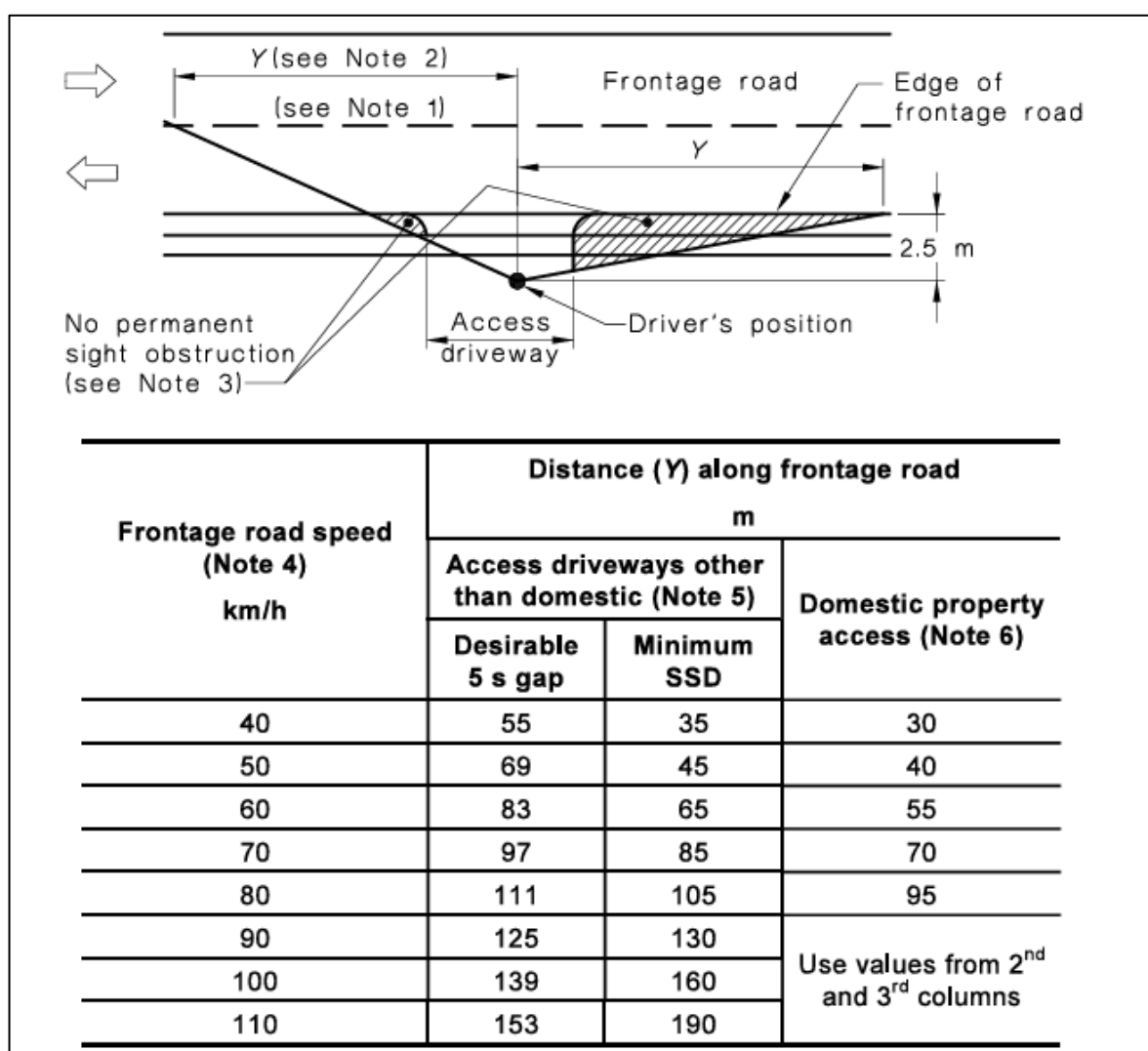
- Accesses are located in low speed urban environment;
- Turn treatments are intended provided increase road safety through the reduction of rear end or turning incidents. Crash report data does not indicate a record of high rear end or turning related crashes at the existing accesses;
- In a school context, best-practice design hierarchy generally prioritises users in the following order: pedestrians, cyclists, school buses, and general vehicular traffic.
- There is sufficient sight distance for through traffic to see a turning vehicle and stop before a collision occurs;
- SIDRA assessment indicates that all accesses operate at a LOS B or better and significant delays to through traffic are not anticipated;
- During the school's peak operational times (highest traffic volumes), the speed limit is reduced to a posted speed of 40km/h;
- Design of the right turn provision would be based on the road design speed, 70km/h. A BAR arrangement would require approximately 100m whilst a short channelised right (CHR(S)) arrangement would be in the order of 170m;
- Inclusion of a right turn treatment would result in significant loss in available street parking;
- A car turning right could obstruct a pedestrian crossing downstream of the vehicle and could potentially reduce pedestrian safety as the passing vehicle would be passing the turn vehicle at speed with limited sight distance due to the turning vehicle.
- Introduction of a BAR would increase the number of potential conflict points and geometric complexity to the area and would increase driver decisions; and
- Through traffic may potentially travel at a higher speed when pass and reduce yielding behaviour which reduces pedestrian safety; and
- In accordance with Queensland Road Safety Technical User Volumes (QRSTUV): Guide to Schools, "Design should reduce crash severity and exposure before seeking to optimise traffic flow." and "Treatments that favour capacity or speed at the expense of safety are inappropriate in school environments."

Given the above and the school environment, it is not considered practical or safe to provide right turn treatment at the site accesses. It is proposed that there is no change to the right turn treatments of existing site accesses.



## 10.0 SAFE SIGHT DISTANCE AT ACCESS DRIVEWAY EXITS (AS2890.1)

Required access sight distances at site accesses have assessed against AS2890.1 (2004), Figure 3.2 (shown below as **Figure 72**). The posted speed limit along Yolanda Drive is 60 km/h, while the assumed speed limit along Jonquil Crescent is 50km/hr (built up areas). Please note that the sight distances in the assessment have conservatively been taken 3.35m from the edge of the road carriageway on both Yolanda Drive and Jonquil Crescent to match Austroads Guide to Road Design (AGRD), Part 4A, SISD setback (5m from point of conflict).

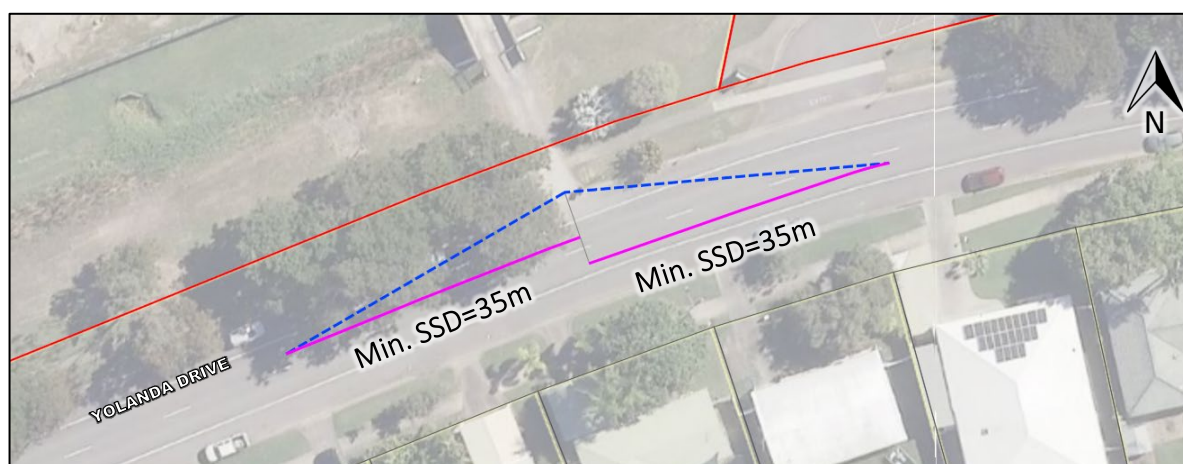


**Figure 72.** Sight distance requirements at access driveways (Source: AS2890.1 (2004), Figure 3.2)

## 10.1 SITE ACCESS 1

As shown in **Figure 73**, both Yolanda Drive westbound and eastbound traffic have adequate sight distance to Site Access 1 during school zone hours (40km/h posted speed limit). However, outside the outside of school zone hours, the first two parking spaces will, obstruct sight lines (refer **Figure 74**). It is proposed that the first two parking spaces are designated as part-time on-street parking spaces. To ensure safety and clarity, parking in these two spaces will be restricted to a loading zone during school zone hours (i.e. Monday to Friday, 8am to 9am and 2.30pm to 3.30pm), with no parking permitted outside these timeframes. The spaces shall be clearly marked with a loading zone and no stopping signs shown in **Figure 75** . The two part-time parking areas will also be appropriately linemarked in accordance with AS1742, Part 11, Section 7 to clearly define them.

In additionally to the above, no stopping is proposed for approximately **15m** west of from Site access 1 to the west and no stopping between Site access 1 and Site access 2 (approximately **14m**) to ensure sight distances are maintained. Refer to **Figure 75** or **Appendix C** for the proposed signage and linemarking.



**Figure 73.** SSD eastbound and westbound approaches to Site access 1 during school zone hours

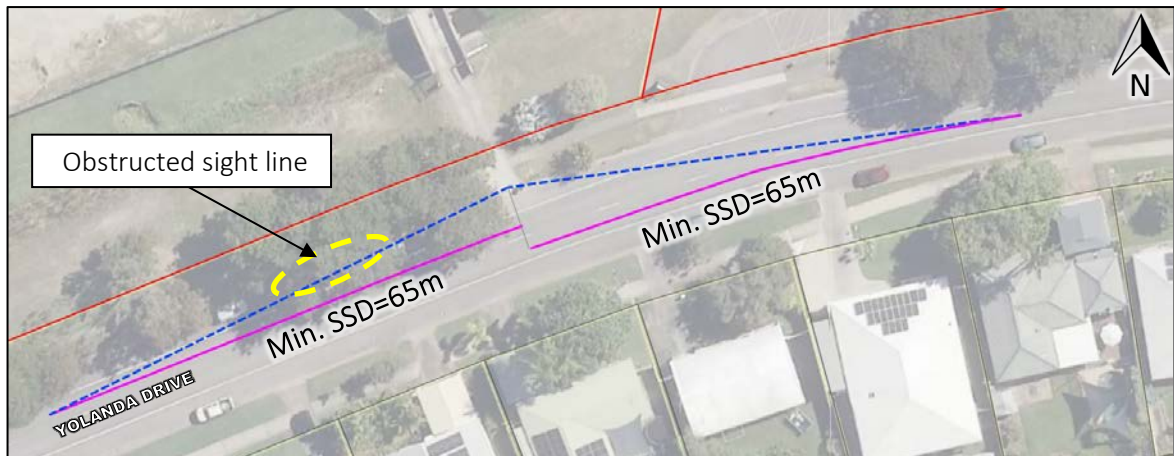


Figure 74. Minimum SSD eastbound and westbound approaches to Site access 1 outside the school zone hours

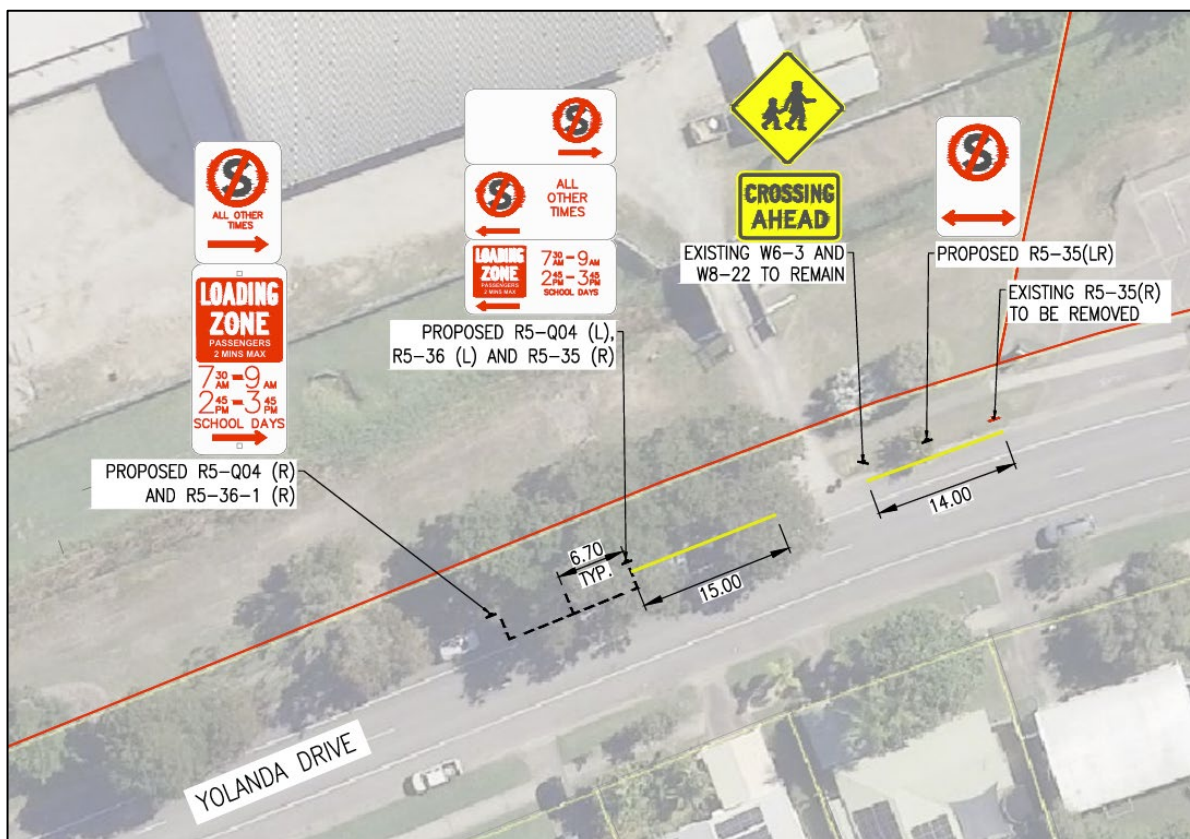


Figure 75. Proposed School Zone parking bays

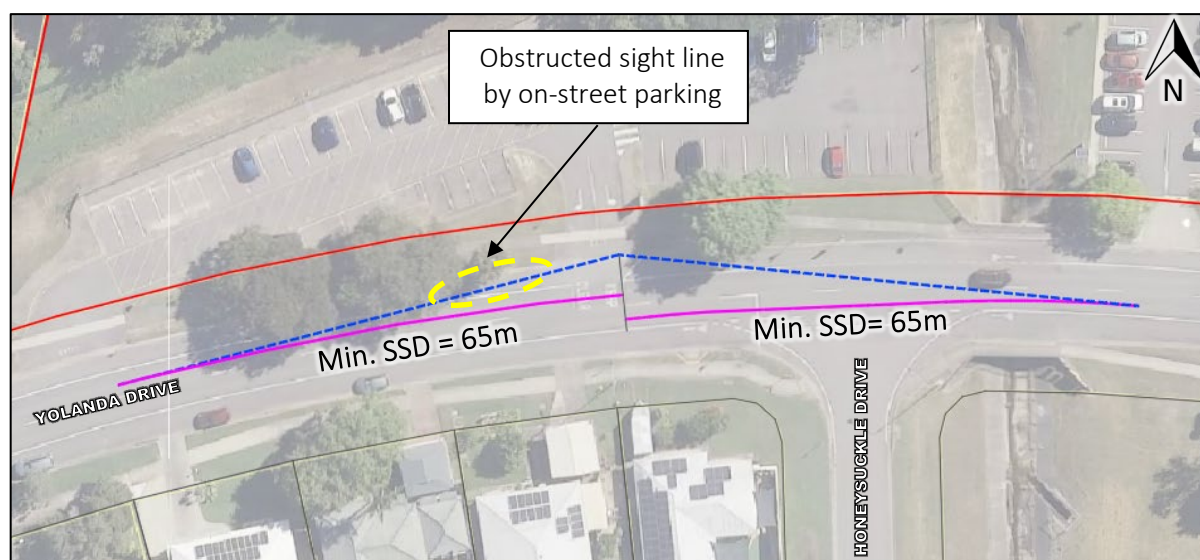
## 10.2 SITE ACCESS 2

Site access 2 is an ingress access. Refer to **Sections 11.1.2** of this report for pedestrian sight distance considerations and **Section 11.2.2** risk assessment against TMR guideline for treatment options to improve pedestrian safety at driveways.

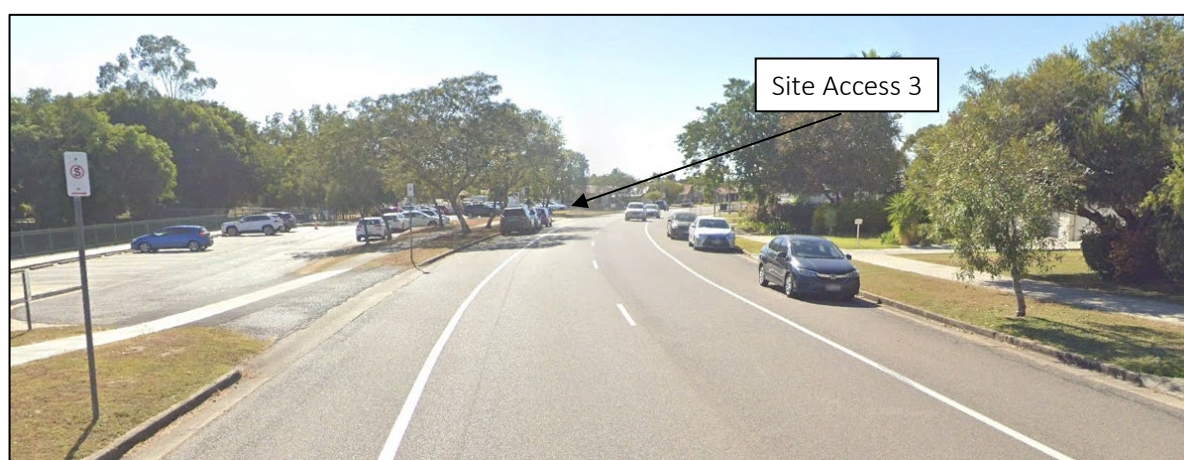


### 10.3 SITE ACCESS 3

The posted speed limit along Yolanda Drive is 60 km/h. In accordance with AS2890.1 (2004), Figure 3.2 (shown as **Figure 72** above), the minimum stopping sight distance is **65m**. As illustrated in **Figure 76** Site access 3 has sufficient minimum stopping sight distance from both the eastbound and westbound approaches is achievable, however, the driver's line of sight for eastbound traffic vehicles is obstructed by on street parking (shown in **Figure 77**). It is recommended that a no stopping sign be installed approximately 16meters from the western edge of site access 3 with unbroken yellow no stopping line. Moreover, an unbroken yellow no stopping line is also proposed approximately 17 meters from the eastern edge of site access 3. The existing R5-35(L) and R7-1-4 is to remain, with the proposed R5-20 (R). Refer to **Appendix C** for the proposed signs and unbroken yellow no stopping line distances.



**Figure 76.** Minimum stopping sight distance from eastbound and westbound approaches to Site Access 3



**Figure 77.** Site access 3 line of sight from eastbound approach (Source: Google Maps)



Figure 78. Site access 3 line of sight from westbound approach (Source: Google Maps)

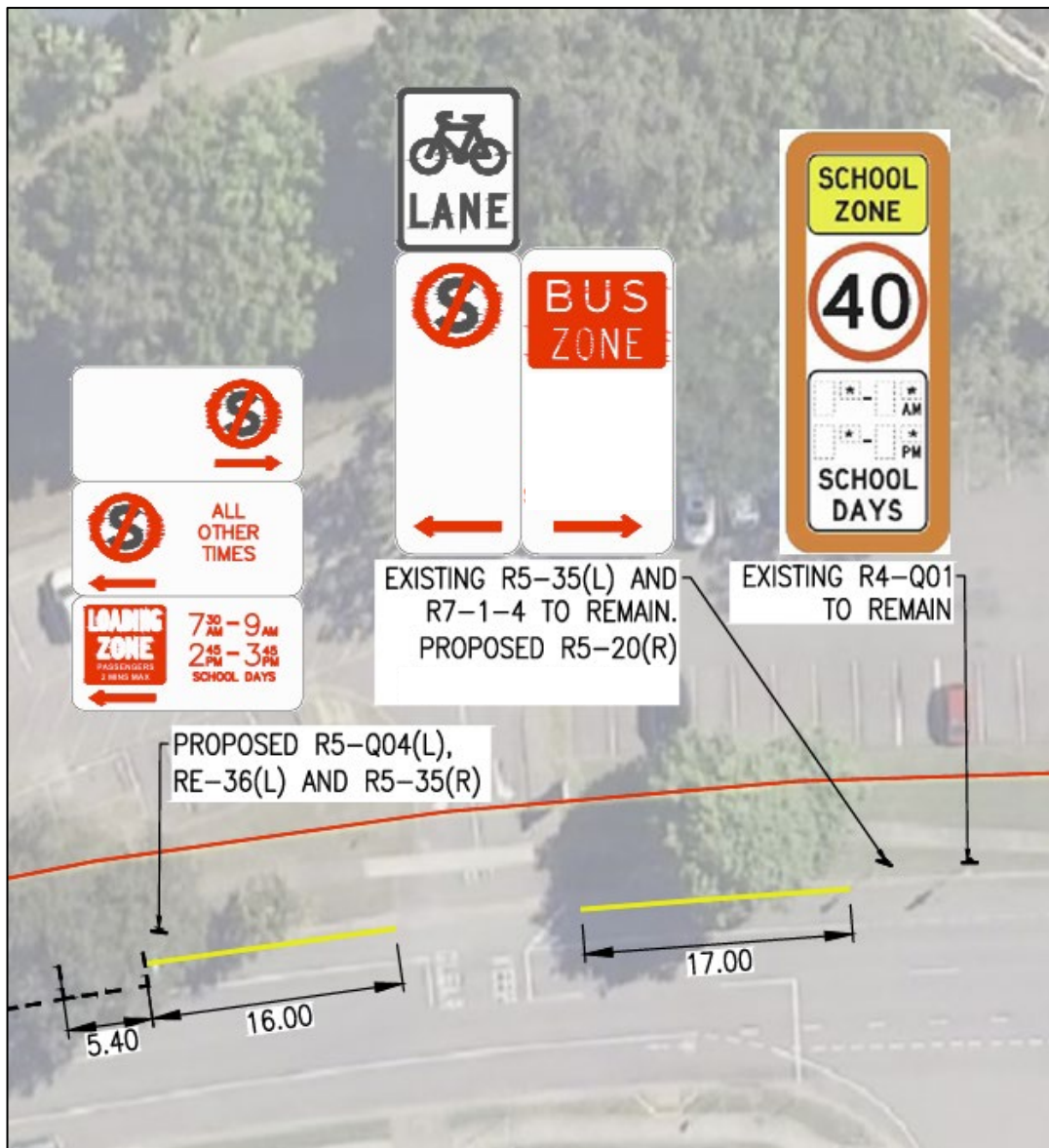


Figure 79. Proposed signs and unbroken yellow no stopping line along Site access 3



## 10.4 SITE ACCESS 4

Site access 4, located off Yolanda Drive, requires a minimum stopping sight distance of **65m**. As shown in **Figure 82**, this requirement is satisfied provided sightlines are not obstructed by on-street parking. driveway. As shown in **Figures 82** and **80**, construction vehicles parked on the road currently obstruct the available sight distance. To maintain adequate sight distance for safe vehicle manoeuvring, it is recommended that on-street parking be prohibited adjacent to the access. A yellow solid line next to the kerb is recommend being installed for approximately **10m** on the western side of the driveway and approximately **5.5m** on the eastern side to accommodate the required sight distance.

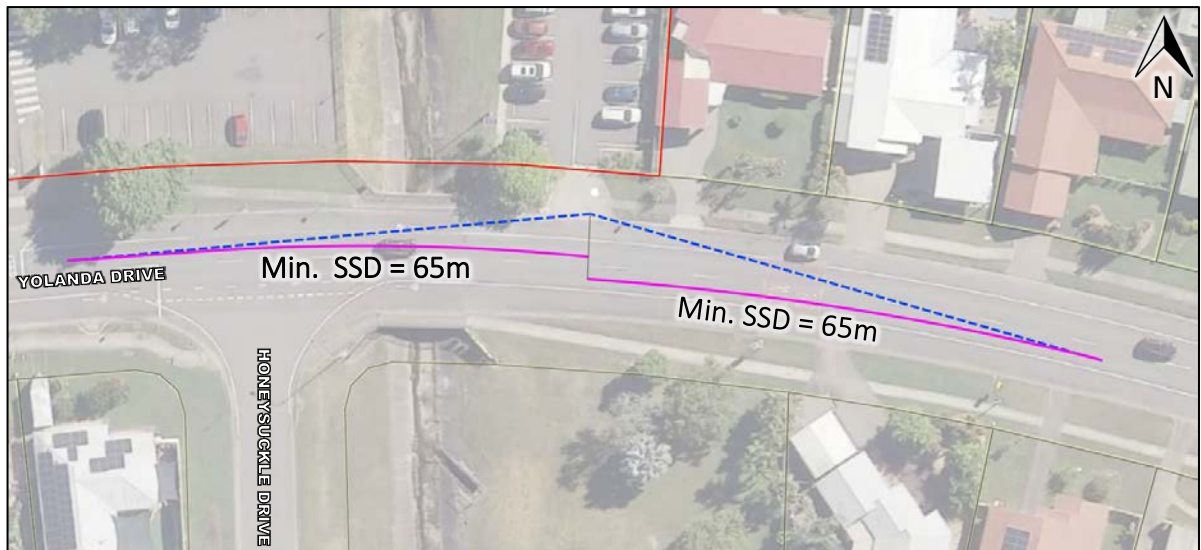


**Figure 80.** Site access 4 line of sight from eastbound approach (Source: Google Maps)



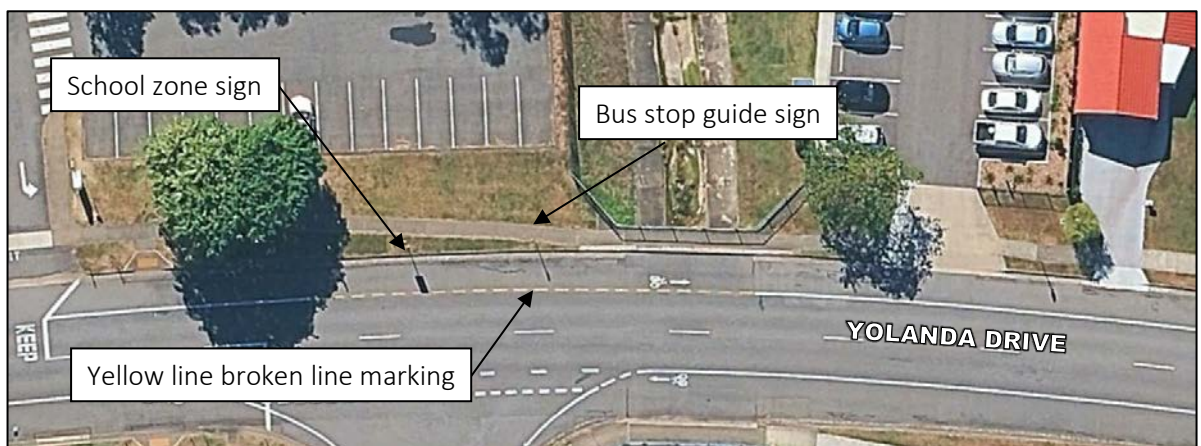
**Figure 81.** Site access 4 line of sight from westbound approach (Source: Google Maps)





**Figure 82.** Minimum stopping sight distance from eastbound and westbound approaches to Site access 4 outside the school hour zone

It is noted that a school bus guide sign and school zone sign are located approximately 25m and 38m west of the access, respectively. Broken yellow edge line marking also commences approximately 10m west of Site access 4. Refer **Figure 83** and **Figure 84** for location of existing signs and yellow line marking area.

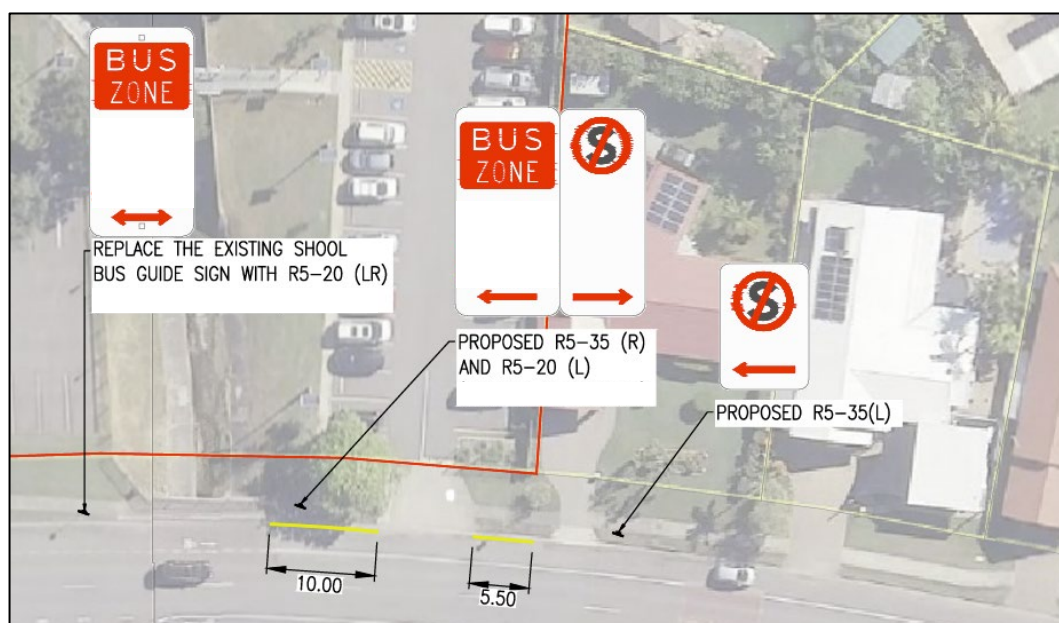


**Figure 83.** Existing bus stop signage location and linemarking (Source: Google Maps)



**Figure 84.** Site access 4 existing signs and example of parked vehicle west of access (Source: Google Maps)

It is recommended that the existing blue school bus guide signage be replaced with parking restriction, bus zone signage (R5-20 (RL)). In addition, it is proposed that new bus zone (R5-20 (L) and R5-35 (R)) are installed as shown in **Figures 79** and **85** to clearly define the area. Refer to **Appendix C** for the proposed signs and unbroken yellow no stopping line areas.

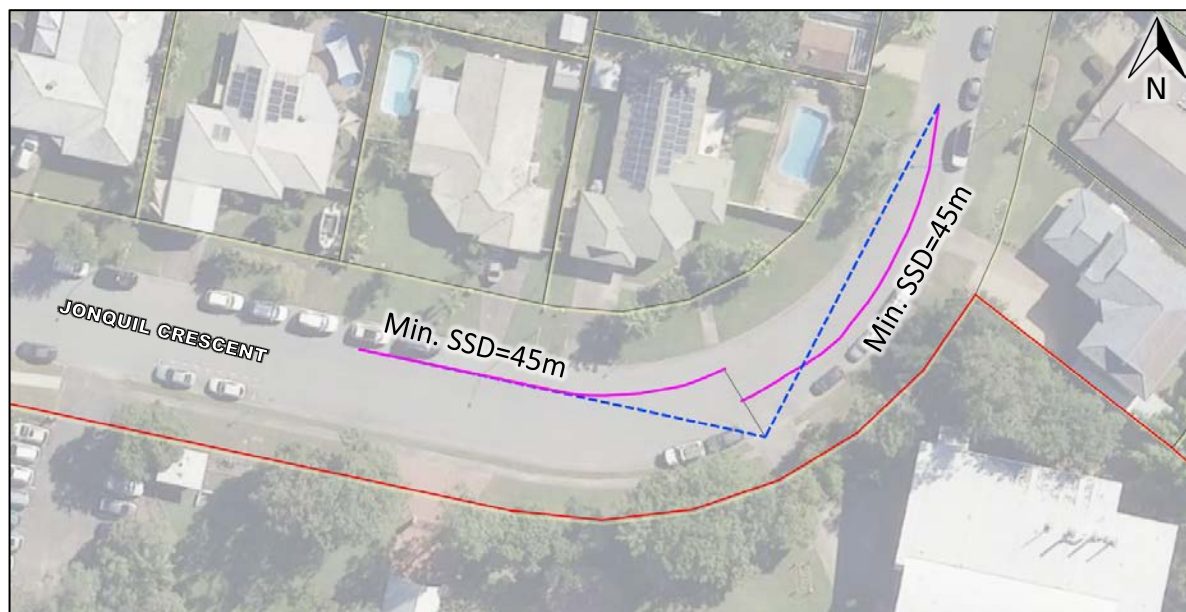


**Figure 85.** Proposed signs and pavement marking along Site access 4

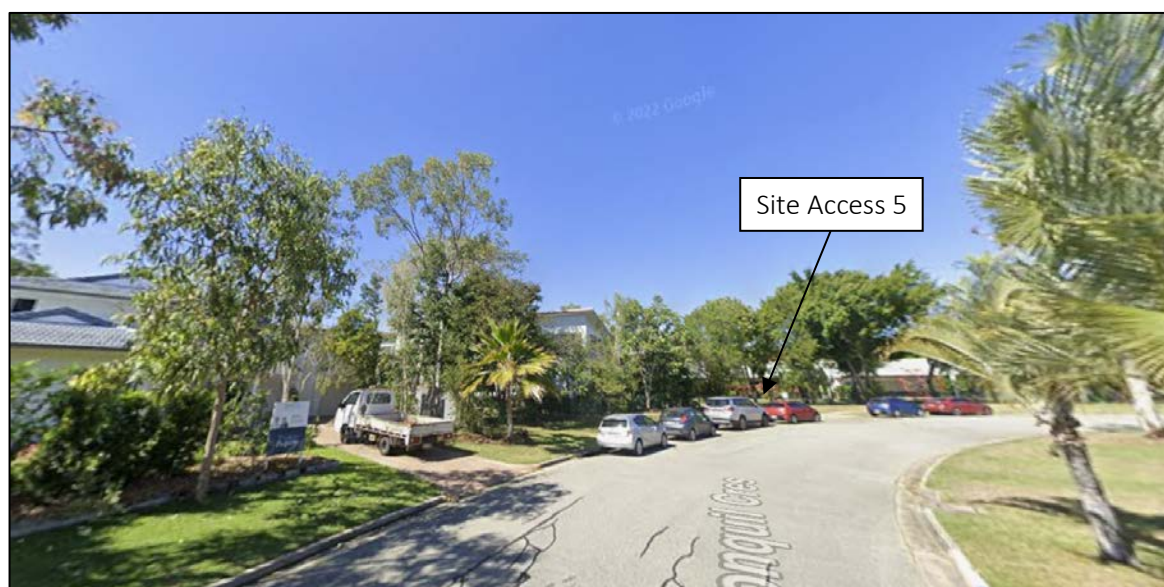


## 10.5 SITE ACCESS 5

Site access 5 is accessed via Jonquil Crescent. The speed limit along Jonquil Crescent is not posted, however, as this is a residential built area. The default speed limit is thus 50km/h. According with AS2890.1, Figure 3.2 (shown as **Figure 72** above), the required minimum SSD is **45m**. **Figure 86** demonstrate that Site access 5 has adequate sight distance to meet the minimum stopping sight distance.



**Figure 86.** Minimum SSD of eastbound and westbound approaches to Site access 5.



**Figure 87.** Site access 5 line of sight from eastbound approach (Source: Google Maps)



**Figure 88.** Site access 5 line of sight from westbound approach (Source: Google Maps)

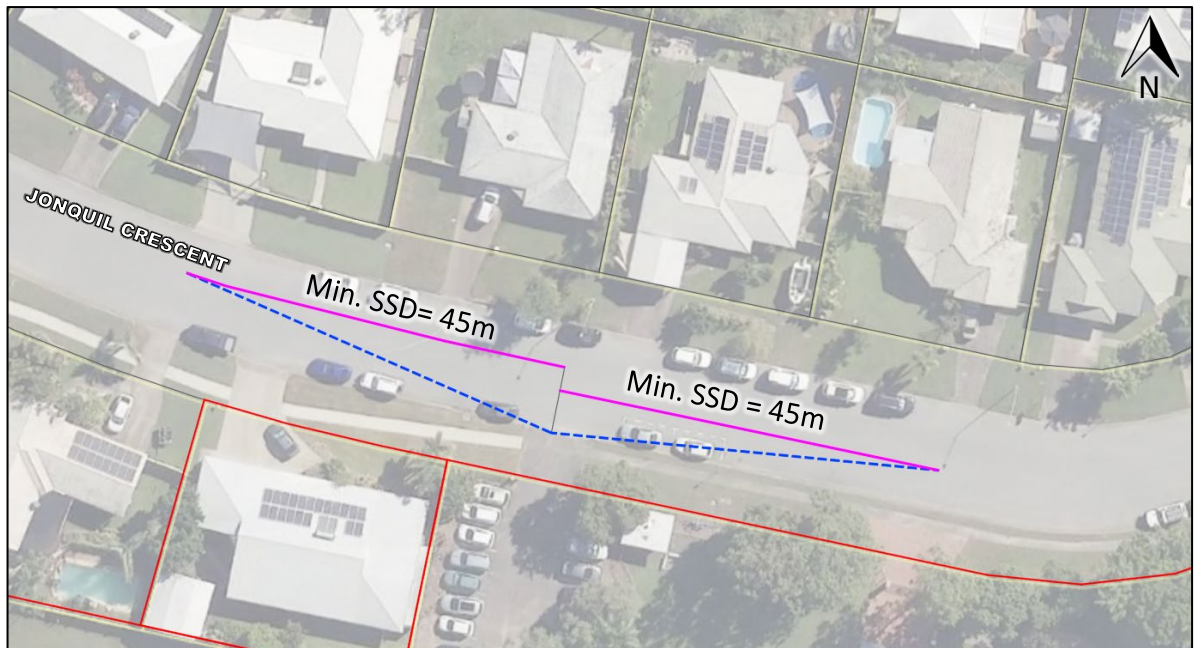
## 10.6 SITE ACCESS 6

Site access 6 is off Jonquil Crescent. The speed limit along Jonquil Crescent is not posted, however, as this is a residential built area. The default speed limit is thus 50km/h. According to AS2890.1, Figure 3.2 (shown as **Figure 72**), the minimum required stopping sight distance is **45m**. **Figure 86** demonstrate that Site access 6 provides adequate minimum required stopping sight distance, provided that driver's line of sights is not obstructed by on street parking

Currently, there are two on-street parking bays located along the eastern side of Site access 3. To ensure the required sight distance is consistently maintained, it is proposed that these bays be signed with no stopping (R5-36-1) restrictions and unbroken yellow. No stopping is proposed for approximately **8m** west of Site access 6 and **3m** east as shown in **Figure 92** and **Appendix C**. This signage will prevent vehicles from parking in locations that would otherwise impede visibility for drivers exiting Site access 6.

It is understood that Site access 6 serves as a staff-only car park, with vehicle arrivals and departures typically occurring within 30 minutes before and after the AM and PM peak periods. Outside these times, traffic volumes are expected to be minimal. It is proposed that parking in these existing bays is restricted during staff arrival and departure times.





**Figure 89.** Minimum stopping sight distance of eastbound and westbound traffic approaches to Site access 6



**Figure 90.** Site access 6 line of sight from eastbound approach (Source: Google Maps)



**Figure 91.** Site access 6 line of sight from westbound approach (Source: Google Maps)



**Figure 92.** Proposed Signs along Site access 6

## 10.7 SITE ACCESS 7

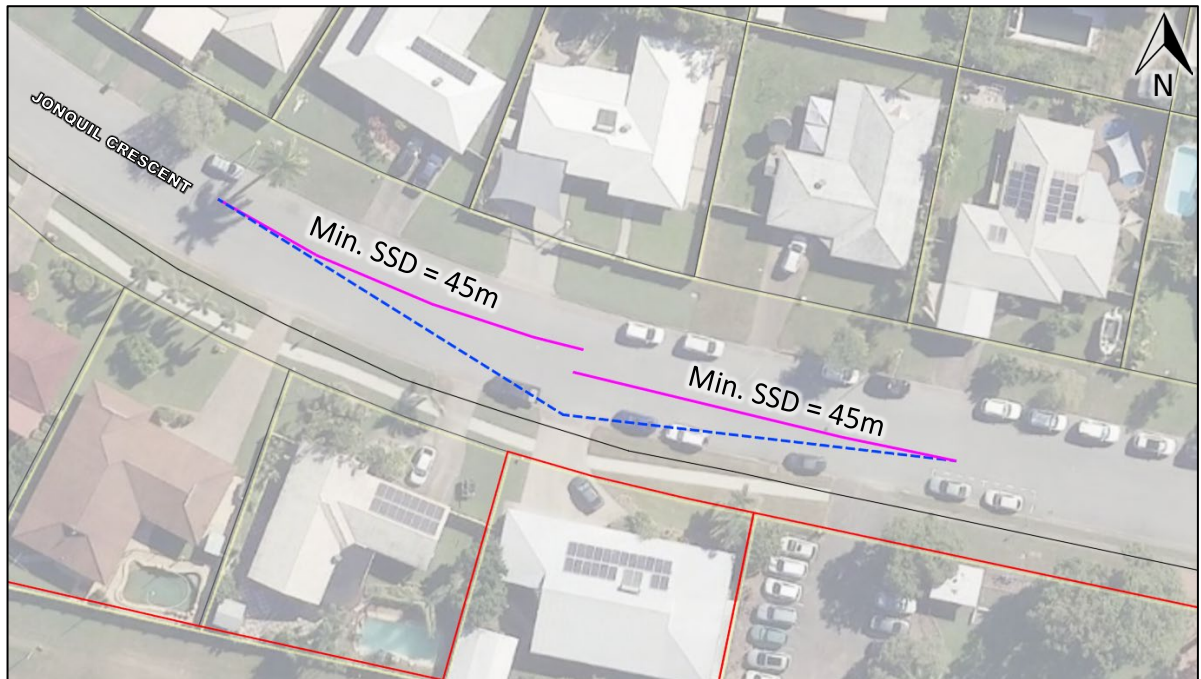
Site access 7 is the existing driveway located on the newly acquired lot at 9 Jonquil Crescent. A Material Change of Use (MCU24/0120) application has been lodged for this property to allow its use as an office space. Accordingly, the driveway has been assessed as a non-domestic property, however, will operate closer to a domestic driveway given the limited number of parking spaces available.

As shown **Figure 93**, minimum required stopping sight distance can be achieved to Site access 7, provided that the driver's line of sight is not obstructed by on-street parking. Site access 7 will serve four (4) off-street parking spaces (including one accessible parking space) designated for staff use only.



As such, traffic volumes are expected to be very low, and the driveway will operate similarly to a domestic access given the minimal vehicle movement.

Due to the low-volume and low-speed nature of this access, no mitigation measures are proposed to be implemented with respects to linemarking or parking restrictions. Refer to **Figures 94** and **95** for minimum sight distance and street view of Site access 7.



**Figure 93.** Minimum SSD of eastbound and westbound approaches to Site access 7



**Figure 94.** Site Access 7 line of sight from eastbound approach (Source: Google Maps)

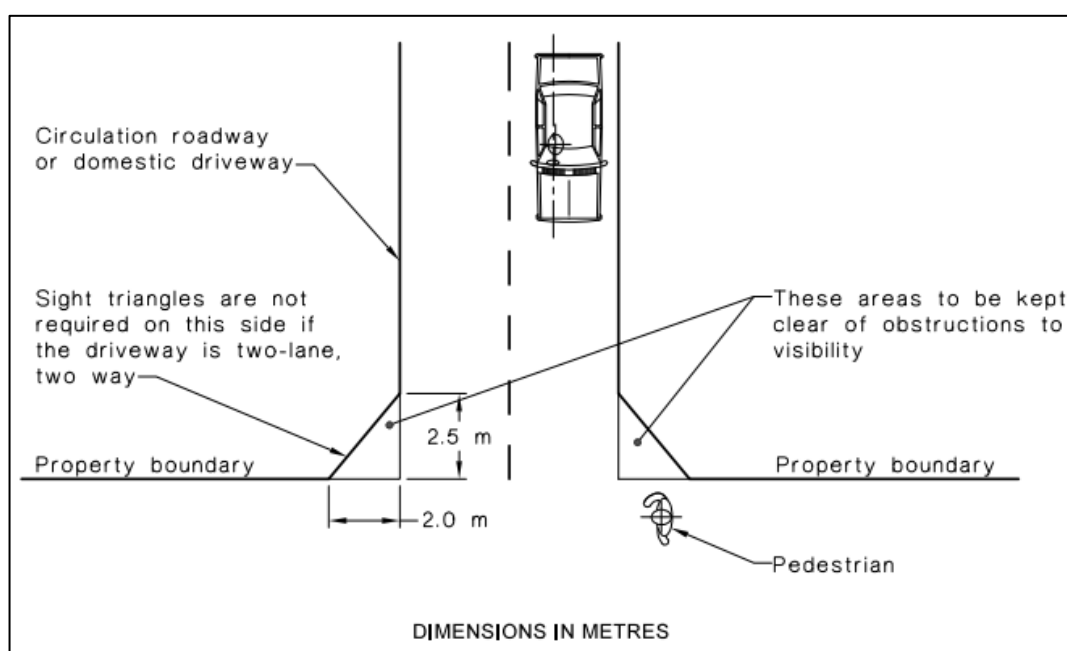


*Figure 95. Site Access 7 line of sight from eastbound approach (Source: Google Map)*

## 11.0 PEDESTRIAN, BICYCLE AND PATH USER SAFETY

### 11.1 PEDESTRIAN SAFETY DISTANCE IN ACCORDANCE WITH AS2890.1

Site accesses shall comply with AS2890.1 (2004), Figure 3.3, depicted in **Figure 96**. The minimum sight lines for pedestrian safety require a vertical clearance of 2.5 meters and a horizontal clearance of 2.0 meters, measured from the property boundary. It is essential that the sight triangle areas at driveway accesses remain unobstructed to ensure clear visibility. This is crucial for allowing pedestrians to be seen by exiting vehicles, thereby facilitating safe crossing of the pathway.

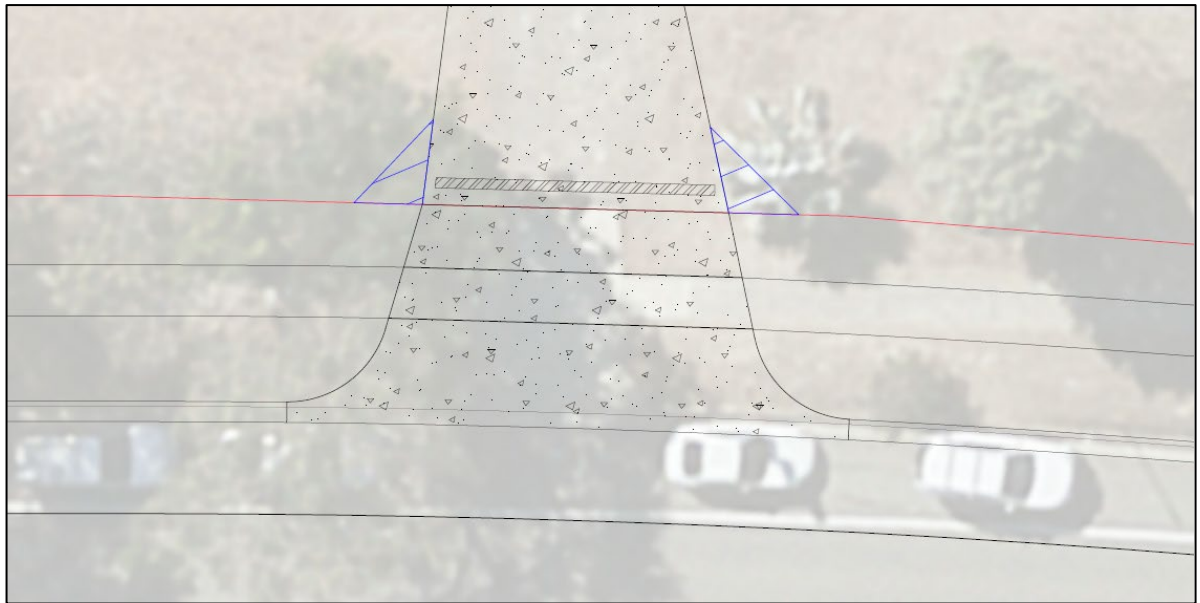


**Figure 96.** Minimum sight line for pedestrian safety (Source: AS2890.1 (2004), Figure 3.3)

#### 11.1.1 Site access 1

Site Access 1 has been previously evaluated by Langtree Consulting in report R-NP0307 dated 23/11/2023 as part of development application (MCU23/0041) for HPE Court area works. The report recommended widening of Site access 1, as depicted in the **Figure 97**, to improve functionality. Site access 1 was proposed to be widened to cater for an 8.8m medium rigid vehicle (MRV). It is noted that a 12.5m heavy rigid vehicle (HRV) was also utilised as the check vehicle. As shown on **Figures 97** and **98**, the existing trees adjacent to the proposed reconstructed site access are within the sight lines. It is noted that subsequent to the report, the trees noted in the figures have been removed as part of the access reconstruction works. Refer to **Figures 99** and **100** for the current access arrangement following the reconstruction.





**Figure 97.** Pedestrian sight distance at Site access 1



**Figure 98.** Existing Site access 1 and trees to be removed (Source: R-NP0307, Figure 18)





*Figure 99. Reconstructed Site access 1 (Looking from the west)*



*Figure 100. Reconstructed Site Access 1 (looking from across the access)*

From site visit photos, it is noted that the kerbside tree situated between Site Access 1 and Site Access 2 has a shrubby growth habit with low-hanging branches. Trees of this form are not well suited to street environments, as they can obstruct sightlines and create safety hazards for pedestrians and cyclists. Street trees with a strong single stem and a naturally clear trunk are preferred to ensure safe movement and unobstructed visibility. **Figure 98** shows the tree in October 2022 and **Figure 99** shows the tree in April 2026. It is recommended that the tree is replaced with a more appropriate species.



### 11.1.2 Site access 2

Site access 2 is an egress access and as such, AS2890.1 (2004), Figure 3.3 does not apply. It is however noted that parking is currently permissible to the edge of Site access 2 on the eastern side and 3m on the western side. Refer to **Figure 101** for existing No stopping site locations either side of Site access 2.



**Figure 101.** No stopping signs either side of Site access 2 (taken 18 October 2023)

When vehicles are parked on the street close to the access sightlines to/from a car to a pedestrian may be lost. A pedestrian crash was recorded near this access in 2007, and while historic (older than 10 years old), review of the access in 2007 has been conducted to identify the any issues. From aerial and street view imagery of the access in 2007 (**Figures 102** and **103** respectively) the following is noted:

- no off-street parking spaces no parking existed near the ingress access at the time. This has likely attributed to drivers accessing the site at a higher speed than with the current arrangement.
- The location of the no stopping signs has not changed between 2007 and the time of this report and vehicles are permitted to park close to the access on either side.
- Access did not have geometry features to encourage a lower speed.



*Figure 102. Aerial view of Site access 2 7 October 2007 (Source: Google Earth)*

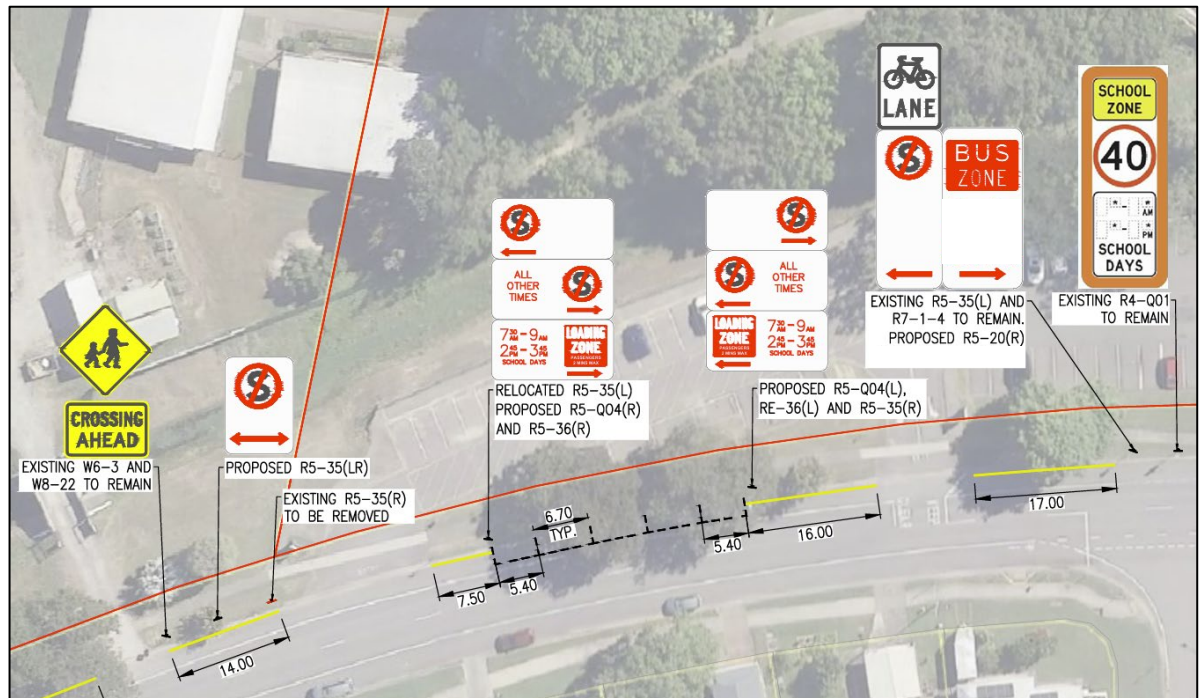


*Figure 103. Street view capture December 2007 (Source: Google Street View)*

For the purposes of this assessment, adopting AS27890.1 **SSD** as the required distance for a vehicle entering the access to stop before collision with a pedestrian it has been determined that extent of the area where parked must be restricted during school hours speed is approximately 7.5m east of Site access 2 and no parking between Site access 1 and 2. It is therefore proposed that an unbroken yellow edge line for **7.5m** east of the access is installed, in addition to relocation of the existing No Stopping (R5-36-1 (L)) sign. The existing No Stopping (R5-36-1 (R)) sign to the west of the access is to be removed and replaced with a No Stopping either side sign (R5-36-1 (L & R)).

Outside the school zone hours, on-street parking between Site access 2 and Site access 3 continues to obstruct sight lines for entering and departing vehicles (due to higher operating speeds outside of school zone hours). To address this, it is recommended that the parking between Site access 2 and Site

access 3 only be used during the school zone hours, with on street parking prohibited all other times. In addition it is proposed that the parking bays between Site access 2 and Site access 3 be lined marked with approximately five (5) spaces provided. Refer to **Figure 104** and **Appendix C** for the proposed parking signage and linemarking.

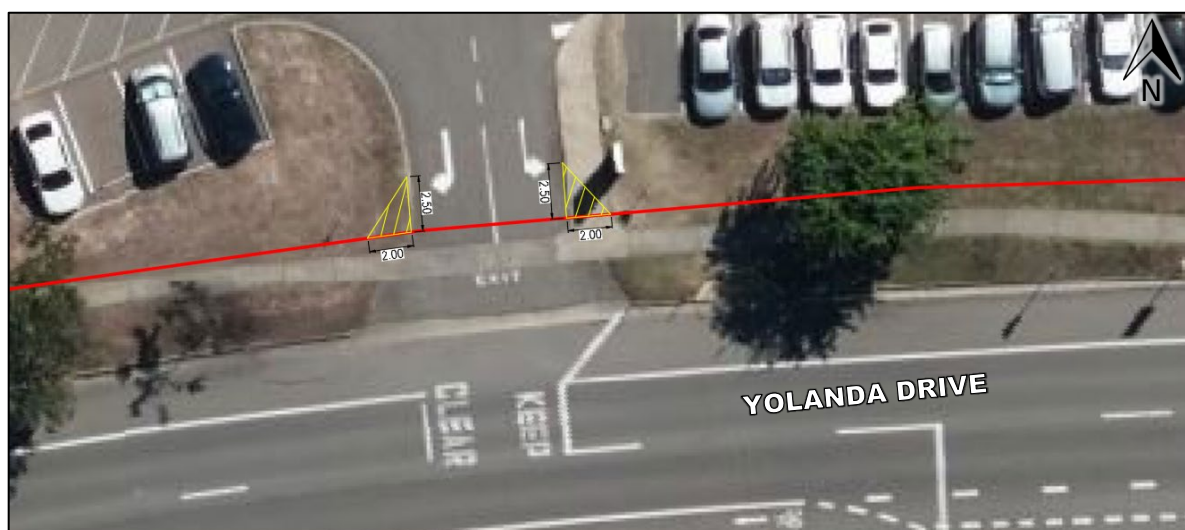


**Figure 104.** Proposed signs and pavement marking along sign access 2



### 11.1.3 Site access 3

As illustrated in **Figure 105**, Site access 3 has adequate pedestrian sight distance in accordance with AS2890.1. The existing access shows that no obstructions are placed within the sight triangle areas, maintaining safe visibility for vehicles to pedestrians.



**Figure 105.** Pedestrian Sight Distance at Site access 3

### 11.1.4 Site access 4

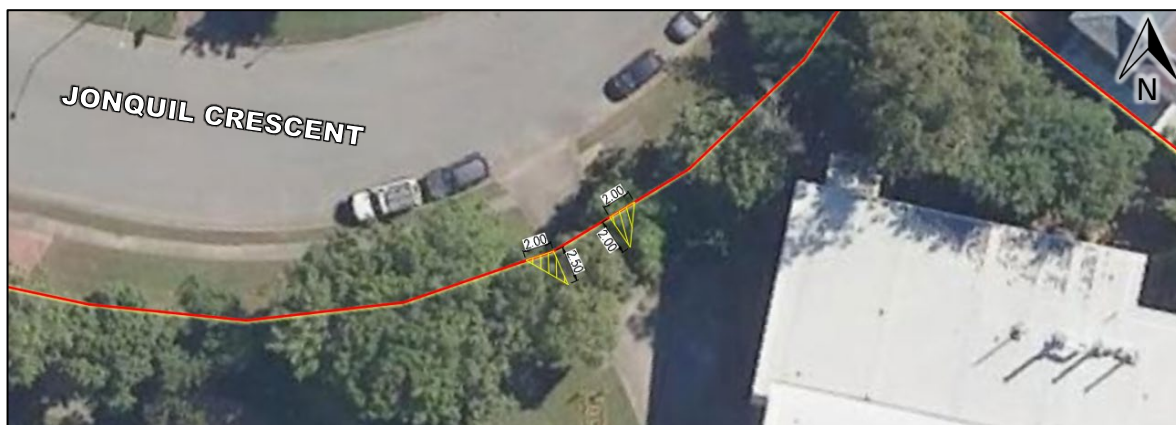
As illustrated in **Figure 106**, Site access 4 has adequate pedestrian sight distance. The proposed development shows that no obstructions are placed within the sight triangle areas, maintaining safe visibility for vehicles to pedestrians.



**Figure 106.** Pedestrian Sight Distance at Site access 4

### 11.1.5 Site access 5

As shown on **Figure 107**, Site access 5 has adequate pedestrian sight distance. It is noted that aerial image shows there are tree branches over the site access. While aerial imagery shows tree branches near the access, **Figure 108** street view indicates no obstruction, with the fence providing clear visibility. It is recommended that existing trees be retained but maintained to prevent branches from encroaching into the sight distance envelope.



**Figure 107.** Pedestrian Sight Distance at Site access 5

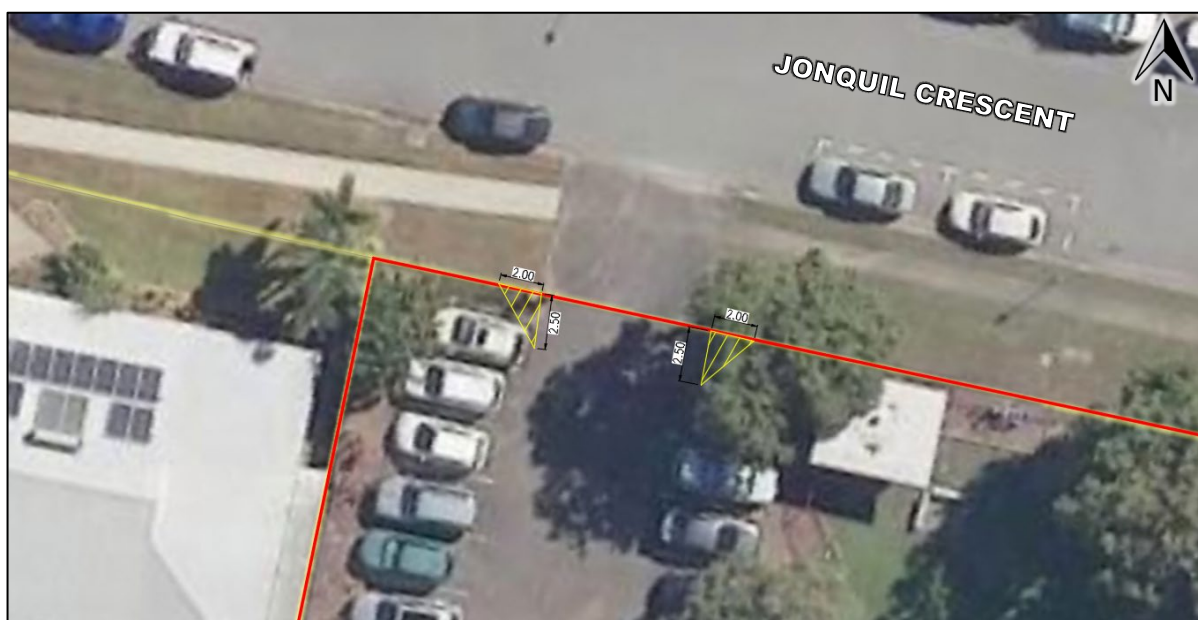


**Figure 108.** Site access 5 street view (Source: Google Maps)



#### 11.1.6 Site access 6

As shown on **Figure 109**, Sight Access 6 has adequate pedestrian sight distance. **Figure 110** shows that fence along the site access is see through in design and as such, there are no obstruction to pedestrian sight distance.



**Figure 109.** Pedestrian sight distance at Site access 6.



**Figure 110.** Site access 6 Street View (Source: Google Maps)

#### 11.1.7 Site access 7

As shown on **Figure 111**, Sight Access 7 has adequate pedestrian sight distance. **Figure 112** shows that the driveway cross over along site access 7 is free from any obstruction. It is noted that in the MCU24/0120 application, the driveway hardstand will be widened to the east, and no fencing or other infrastructure is proposed at this application.



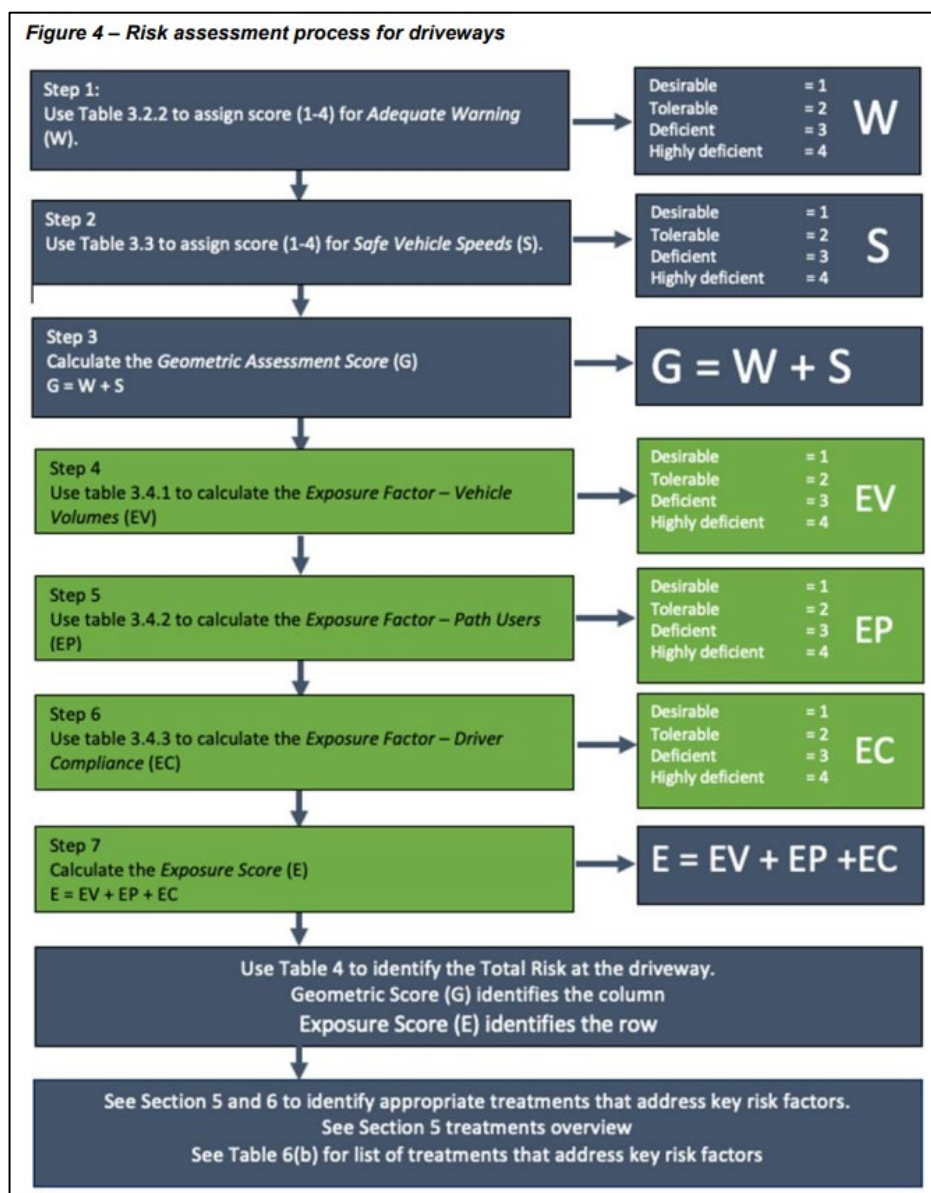
**Figure 111.** Pedestrian sight distance at Site access 7.



**Figure 112.** Site Access 7 Street View (Source: Google Maps)

## 11.2 TMR GUIDELINE FOR TREATMENT OPTIONS TO IMPROVE SAFETY OF PEDESTRIANS, BICYCLE RIDERS, AND OTHER PATH USERS AT DRIVEWAYS

Although road frontages to the school are not principal cycle routes, it is anticipated that school children and other cyclists may will utilise the pathways fronting the school. As such risk between path users and vehicles at driveway have been assessed been evaluated in accordance with the Department of Transport and Main Roads (TMR) Guideline for 'Treatment Options to Improve Safety of Pedestrians, Bicycle Riders, and Other Path Users at Driveways' (hereafter referred to as TMR's Driveway Guideline). The risk assessment process is detailed in **Figure 113** and risk level in **Figure 114**.



**Figure 113.** Risk Assessment Process for Driveways (Source: TMR Guideline – Treatment options to improve safety of pedestrians, bicycle riders and other path users at driveways, Figure 4).



|                                   |                             | Geometric assessment score (G = W + S)      |                                                                 |                                                                 |                                                               |
|-----------------------------------|-----------------------------|---------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|
| Exposure score (E = EV + EP + EC) | Exposure scores             | Desirable<br>Range 2–3                      | Tolerable<br>Range 4–5                                          | Deficient<br>Range 5–7                                          | Highly deficient<br>Range 7–8                                 |
|                                   | Low exposure<br>3–4         | Existing treatments appropriate             |                                                                 | Consider low-cost treatment options                             |                                                               |
|                                   | Moderate exposure<br>5–7    | Low risk<br>Existing treatments appropriate | Consider low-cost treatment options                             | Recommend supplementary treatments or redesign to address issue | Require supplementary treatments or redesign to address issue |
|                                   | High exposure<br>8–10       |                                             | Recommend supplementary treatments or redesign to address issue |                                                                 |                                                               |
|                                   | Very high exposure<br>11–12 |                                             | Recommend supplementary treatments or redesign to address issue | Require supplementary treatments or redesign to address issue   |                                                               |

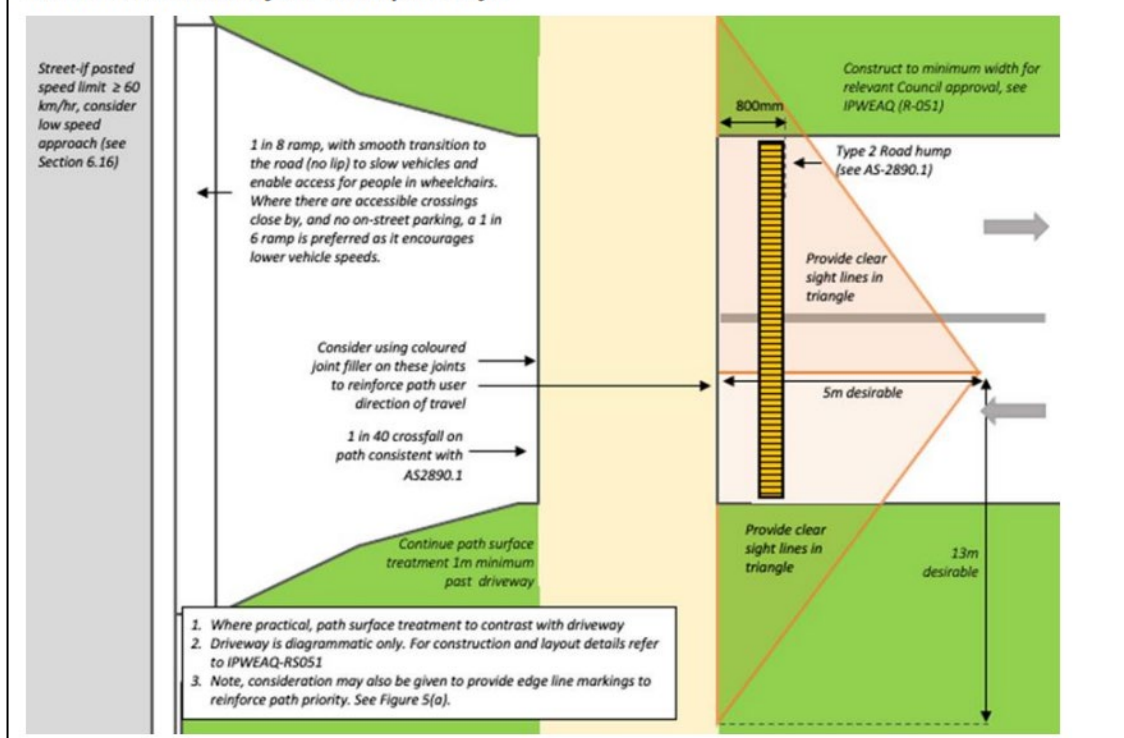
Figure 114. Table 4- Risk levels level for assessment process.

#### 11.2.1 Site access 1 - Risk Assessment

As previously mentioned, Site access 1 has been previously evaluated by Langtree Consulting in report R-NP0307 dated 23/11/2023 as part of development application (MCU23/0041) for HPE Court area works. The report recommended that several trees be removed to enhance pedestrian sightlines and to accommodate the proposed driveway reconstruction. Additionally, the report recommends that risk between path users and vehicles at the driveway will be managed in general accordance with TMR's Driveway Guideline, Figure 5(b) provided as **Figure 115** below.

Risk assessment for Site access 1 is shown in **Table 13**. From the assessment, the access geometric score is 2 and the exposure score is 9. Refer to **Figure 99** for image of current Site access 1 including the installed thus supplementary treatments.

**Figure 5(b) – Recommended treatments to manage risks between path users and vehicles at commercial driveway on other pathways**



**Figure 115.** Risk Assessment Process (Source: TMR Guideline- Treatment options to improve safety of pedestrians, bicycle and other path users at driveways, Figure 5 (b)).

**Table 13.** Site access 1 Risk Assessment.

| Step                | Description                             | Reference            | Score                                      | Comments                                                                                   |
|---------------------|-----------------------------------------|----------------------|--------------------------------------------|--------------------------------------------------------------------------------------------|
| Step 1              | Adequate Warning (W)                    | Table 3.2.2          | 1                                          | Clear desirable path site line.                                                            |
| Step 2              | Safe Vehicle Speeds (S)                 | Table 3.3            | 1                                          | Speed hump provided                                                                        |
| Step 3              | Geometric Assessment Score (G) $G=W+S$  |                      | 2                                          | <b>Desirable</b>                                                                           |
| Step 4              | Exposure Factor- Vehicle Volumes (EV)   | Table 3.4.1          | 3                                          | 21-100 peak hour trips                                                                     |
| Step 5              | Exposure Factor- Path Users (EP)        | Table 3.4.2          | 4                                          | High demand routes to School and close proximity to kindergartens.                         |
| Step 6              | Exposure Factor- Driver Compliance (EC) | Table 3.4.3          | 2                                          | Assumed that drivers and path users consistently use eye contact to negotiate who proceeds |
| Step 7              | Exposure Score (E)                      | $E= EV+ EP + EC$     | 9                                          | <b>High Exposure</b>                                                                       |
| Level of Assessment |                                         | Table 4 (Figure 114) | Low Risk – Existing treatments appropriate |                                                                                            |



### 11.2.2 Site access 2 - Risk Assessment

Site access 2 functions as an ingress to the public car park area. As summarised in **Table 14**, this access has a high exposure score with existing treatments appropriate. Its high exposure is influenced by its role as a main car park entrance, its proximity to kindergartens. It is noted that the footpath through the access was replaced in 2022. Footpath appears to be humped as part of works. Retrofitted treatment installed in 2022 assumed to slow entering vehicles and provide effective speed calming treatment. Refer to **Figures 116** and **117**. Additionally, the pedestrian pathway is continuous and colour-differentiated, improving visibility for drivers and helping to clearly delineate pedestrian movement areas. From the assessment, the access is considered low risk and existing treatments have been deemed adequate.

**Table 14.** Site access 2 (Ingress) Risk Assessment

| Step                       | Description                             | Reference                   | Score                                             | Comments                                                                                                                                                              |
|----------------------------|-----------------------------------------|-----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b>              | Adequate Warning (W)                    | Table 3.2.2                 | 2                                                 | Pedestrians are clearly visible on vehicles left turning in with condition. See comments below regarding right turning in vehicle. West of driveway has adequate SSD. |
| <b>Step 2</b>              | Safe Vehicle Speeds (S)                 | Table 3.3                   | 1                                                 | Footpath appears to be humped as part of 2022 works. Retrofitted treatment has been assumed to provide speed calming treatment. Refer to <b>Figures 116 and 117</b> . |
| <b>Step 3</b>              | Geometric Assessment Score (G), $G=W+S$ |                             | 3                                                 | <b>Desirable</b>                                                                                                                                                      |
| <b>Step 4</b>              | Exposure Factor-Vehicle Volumes (EV)    | Table 3.4.1                 | 4                                                 | > 100 Peak hour trips and 20+ Car parking spaces                                                                                                                      |
| <b>Step 5</b>              | Exposure Factor-Path Users (EP)         | Table 3.4.2                 | 4                                                 | High Demand routes to school and close to proximity to kindergartens                                                                                                  |
| <b>Step 6</b>              | Exposure Factor-Driver Compliance (EC)  | Table 3.4.3                 | 2                                                 | Assumed that drivers and path users consistently use eye contact to negotiate who proceeds with drivers generally stopping for pedestrians                            |
| <b>Step 7</b>              | Exposure Score (E), $E=EV+EP+EC$        |                             | 10                                                | <b>High Exposure</b>                                                                                                                                                  |
| <b>Level of Assessment</b> |                                         | <b>Table 4 (Figure 114)</b> | <b>Low Risk – Existing treatments appropriate</b> |                                                                                                                                                                       |



**Figure 116.** 2019 Site access 2 arrangement (Source: Google Street view October 2019)



**Figure 117.** Existing Site access 2 arrangement (Source: Google Street view August 2022)

### 11.2.3 Site access 3 - Risk Assessment

During assessment it has been noted that the existing Annandale Christian College (ACC) school sign poses a sight line obstruction at Site access 3. To have sufficient sight lines, it is recommended to relocate the ACC sign not less than 0.5m to the north or to the east. Alternatively, the sign may be raised on a post to prevent visual obstruction. Refer to **Figure 118** for ACC signs locality and **Figure 119** for path users sight lines at Site access 3.

The site access risk assessment of Site access 3 has been completed based on the provision that the ACC sign is relocated or raised. Assessment of Site access 3 indicates that the access is low-risk and existing treatments are sufficient. Additionally, it is noted that currently, the pedestrian pathway is currently colour-differentiated which is an existing form of treatment.



**Figure 118.** Existing Site access 3 (Egress) – existing ACC sign (Source: Google Earth)



**Figure 119.** Sight access 3 path user sight lines

**Table 15.** Site access 3 (Egress) Risk Assessment.

| Step                       | Description                             | Reference                   | Score                                            | Comments                                                                                                                                                                                                                          |
|----------------------------|-----------------------------------------|-----------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b>              | Adequate Warning (W)                    | Table 3.2.2                 | 1                                                | Adequate SSD and pedestrian sight distance on both directions.<br>Coloured bollards on access approach                                                                                                                            |
| <b>Step 2</b>              | Safe Vehicle Speeds (S)                 | Table 3.3                   | 1                                                | Footpath through access replaced in 2022. Footpath appears to be humped as part of works. Retrofitted treatment installed in 2022 assumed to provide appropriately speed calming treatment. Refer to <b>Figures 120 and 121</b> . |
| <b>Step 3</b>              | Geometric Assessment Score (G), $G=W+S$ |                             | 3                                                | <b>Desirable</b>                                                                                                                                                                                                                  |
| <b>Step 4</b>              | Exposure Factor- Vehicle Volumes (EV)   | Table 3.4.1                 | 4                                                | > 100 Peak hour trips and 20+ Car parking spaces                                                                                                                                                                                  |
| <b>Step 5</b>              | Exposure Factor- Path Users (EP)        | Table 3.4.2                 | 4                                                | High demand route to school and close proximity to kindergarten.                                                                                                                                                                  |
| <b>Step 6</b>              | Exposure Factor- Driver Compliance (EC) | Table 3.4.3                 | 1                                                | Drivers consistently giving way to path users. Line markings not extending in the pathways. Pathway fully visible as it is fully marked (painted).                                                                                |
| <b>Step 7</b>              | Exposure Score (E), $E= EV+ EP + EC$    |                             | 9                                                | <b>High Exposure</b>                                                                                                                                                                                                              |
| <b>Level of Assessment</b> |                                         | <b>Table 4 (Figure 114)</b> | <b>Low risk- Existing treatments appropriate</b> |                                                                                                                                                                                                                                   |





**Figure 120.** 2019 Site access 3 arrangement (Source: Google Street view October 2019)



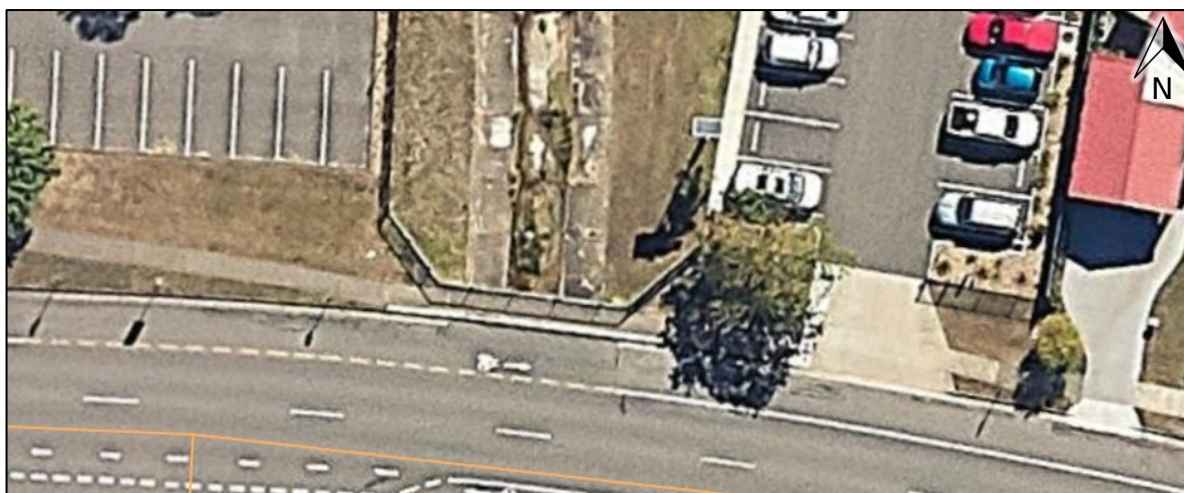
**Figure 121.** Existing Site access 2 arrangement (Source: Google Street view August 2022)

#### 11.2.4 Site access 4 - Risk Assessment

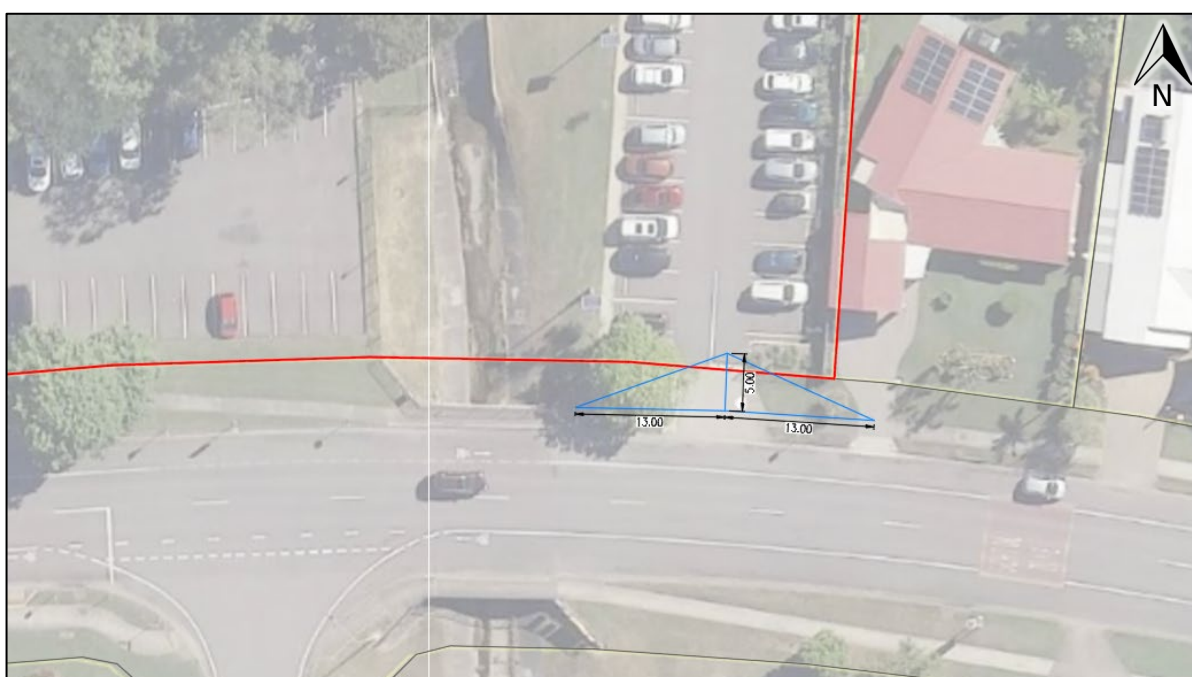
Site access 4 is a high-exposure area with a low-risk existing treatment, serving primarily as staff car parking and retaining this function in the proposed development. Due to the short width of the driveway, vehicles must slow down when entering and exiting which is an existing treatment for safe vehicle speeds (Step 2). Currently, there are no existing no stopping signs on both sides of Site access 4. It is proposed that parking be restricted either side of the access. Refer to **Section 10.4** and **Appendix C** for the proposed location of the No Stopping signs, and extent of the unbroken yellow no stopping line distances. Refer to **Figure 123** for the site access 4 path user sight line. Image of Site access 4 taken on 13th of April 2026 is shown in **Figure 124**. From the assessment it is advisable to line mark or colour the pathway at this access point to enhance driver awareness and reinforce pedestrian priority.

**Table 16.** Site access 4 (Ingress and Egress) Risk Assessment.

| Step                       | Description                                   | Reference                   | Score                                             | Comments                                                                                               |
|----------------------------|-----------------------------------------------|-----------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>Step 1</b>              | Adequate Warning<br>(W)                       | Table 3.2.2                 | 1                                                 | Adequate SSD Fence panels appear to be clear panels.                                                   |
| <b>Step 2</b>              | Safe Vehicle Speeds<br>(S)                    | Table 3.3                   | 3                                                 | Ramp between path and road that do not achieve desirable vertical deflection to slow entering traffic. |
| <b>Step 3</b>              | Geometric Assessment Score (G), $G=W+S$       |                             | 4                                                 | <i>Desirable</i>                                                                                       |
| <b>Step 4</b>              | Exposure Factor-<br>Vehicle Volumes (EV)      | Table 3.4.1                 | 4                                                 | 20+ Car parking Spaces                                                                                 |
| <b>Step 5</b>              | Exposure Factor- Path<br>Users (EP)           | Table 3.4.2                 | 4                                                 | High demand route to school                                                                            |
| <b>Step 6</b>              | Exposure Factor-<br>Driver Compliance<br>(EC) | Table 3.4.3                 | 1                                                 | Drivers consistently giving way to path users                                                          |
| <b>Step 7</b>              | Exposure Score (E), $E= EV+ EP + EC$          |                             | 9                                                 | <i>High Exposure</i>                                                                                   |
| <b>Level of Assessment</b> |                                               | <b>Table 4 (Figure 114)</b> | <b>Low risk - Existing treatments appropriate</b> |                                                                                                        |



*Figure 122. Existing Site access 4 to be retained in the proposed development (Source: Queensland Globe)*



*Figure 123. Sight access 4 path user sight lines*





*Figure 124. Existing Site access 4*

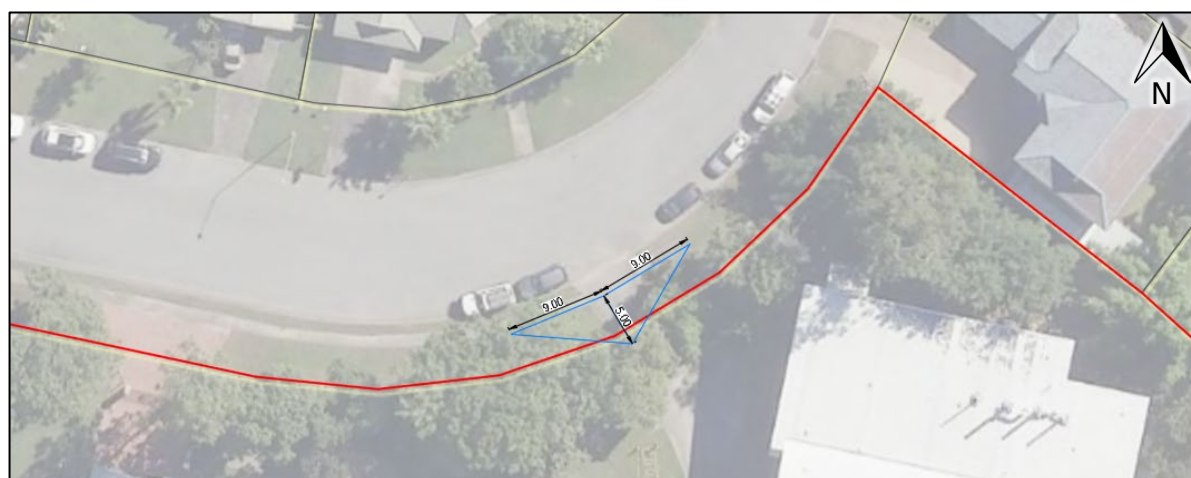


### 11.2.5 Site access 5 - Risk Assessment

Site access 5 is currently an existing maintenance access. Risk assessment shows that Site access 5 low risk and existing treatments are appropriate. Consequently, it is advised that consideration be given to linemarking or colouring the pathway at this access point to enhance driver awareness and reinforce pedestrian priority. Moreover, the trees on the east and west should be properly maintained to refrain branches from obstructing exiting driver line of sight. Refer to **Figure 125** for the path user sight line.

**Table 17.** Site access 5 Risk Assessment.

| Step                       | Description                             | Reference                   | Score                                             | Comments                                                                                                                                                     |
|----------------------------|-----------------------------------------|-----------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b>              | Adequate Warning (W)                    | Table 3.2.2                 | 2                                                 | Adequate SSD and pedestrian sight distance on both directions.                                                                                               |
| <b>Step 2</b>              | Safe Vehicle Speeds (S)                 | Table 3.3                   | 1                                                 | Ramp provided on driveway. Gated access.                                                                                                                     |
| <b>Step 3</b>              | Geometric Assessment Score (G), $G=W+S$ |                             | 3                                                 | <i>Tolerable</i>                                                                                                                                             |
| <b>Step 4</b>              | Exposure Factor- Vehicle Volumes (EV)   | Table 3.4.1                 | 1                                                 | 1-3 peak hour trips and <5 off-street car parking spaces                                                                                                     |
| <b>Step 5</b>              | Exposure Factor- Path Users (EP)        | Table 3.4.2                 | 4                                                 | High demand routes to school                                                                                                                                 |
| <b>Step 6</b>              | Exposure Factor- Driver Compliance (EC) | Table 3.4.3                 | 2                                                 | Assumed that drivers and path users consistently use eye contact to negotiate who proceeds, however likely that drivers consistently give away to path users |
| <b>Step 7</b>              | Exposure Score (E), $E=EV+EP+EC$        |                             | 7                                                 | <i>Moderate Exposure</i>                                                                                                                                     |
| <b>Level of Assessment</b> |                                         | <b>Table 4 (Figure 114)</b> | <b>Low Risk - Existing treatments appropriate</b> |                                                                                                                                                              |



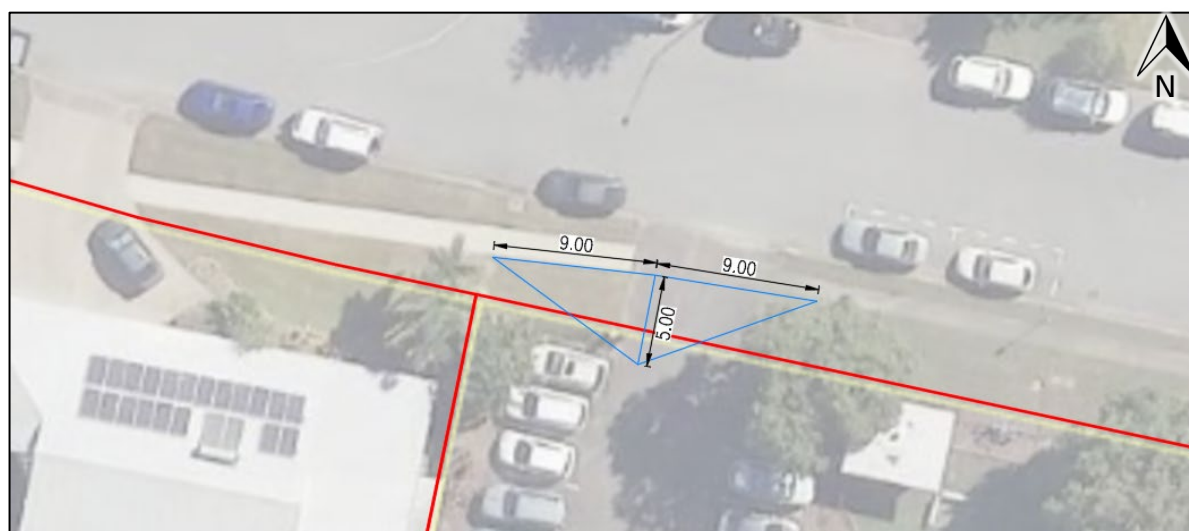
**Figure 125.** Sight access 5 path user sight lines

### 11.2.6 Site access 6 - Risk Assessment

Site Access 6 is a high-exposure area with a low-risk existing treatment appropriate, serving primarily as staff car parking and retaining this function in the proposed development. Ramp is currently provided in the site access. The existing treatment is deemed appropriate however, it is advisable to line mark or colour the pathway at this access point to enhance driver awareness and reinforce pedestrian priority. Refer to **Figure 126** for the path user sight line.

**Table 18.** Site access 6 Risk Assessment.

| Step                       | Description                             | Reference                   | Score                                            | Comments                                                                                   |
|----------------------------|-----------------------------------------|-----------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Step 1</b>              | Adequate Warning (W)                    | Table 3.2.2                 | 2                                                | Adequate SSD and pedestrian sight distance on both directions.                             |
| <b>Step 2</b>              | Safe Vehicle Speeds (S)                 | Table 3.3                   | 1                                                | Ramp provided on driveway. Driveway is approximately 28m in length.                        |
| <b>Step 3</b>              | Geometric Assessment Score (G), $G=W+S$ |                             | 3                                                | <i>Tolerable</i>                                                                           |
| <b>Step 4</b>              | Exposure Factor- Vehicle Volumes (EV)   | Table 3.4.1                 | 3                                                | 10-19 off street car parking spaces                                                        |
| <b>Step 5</b>              | Exposure Factor- Path Users (EP)        | Table 3.4.2                 | 4                                                | High demand routes to school                                                               |
| <b>Step 6</b>              | Exposure Factor- Driver Compliance (EC) | Table 3.4.3                 | 2                                                | Assumed that drivers and path users consistently use eye contact to negotiate who proceeds |
| <b>Step 7</b>              | Exposure Score (E), $E= EV+ EP + EC$    |                             | 9                                                | <i>High Exposure</i>                                                                       |
| <b>Level of Assessment</b> |                                         | <b>Table 4 (Figure 114)</b> | <b>Low Risk - Existing treatment appropriate</b> |                                                                                            |



**Figure 126.** Site access 6 path user sight lines.

### 11.2.7 Site access 7 – Risk Assessment

Site Access 7 is a moderate exposure area with a low-risk existing treatment appropriate, serving primarily as temporary staff car parking. The existing treatment is deemed appropriate however, it is advisable to line mark or colour the pathway at this access point to enhance driver awareness and reinforce pedestrian priority.

**Table 19.** Site access 7 Risk Assessment.

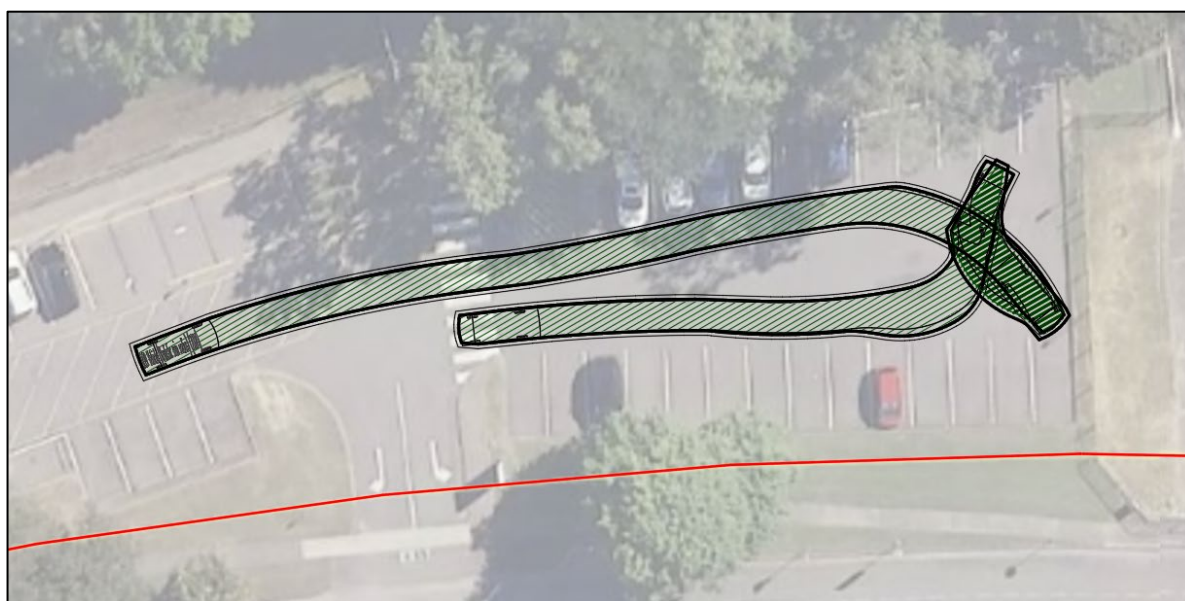
| Step                       | Description                             | Reference                   | Score                                            | Comments                                                       |
|----------------------------|-----------------------------------------|-----------------------------|--------------------------------------------------|----------------------------------------------------------------|
| <b>Step 1</b>              | Adequate Warning (W)                    | Table 3.2.2                 | 2                                                | Adequate SSD and pedestrian sight distance on both directions. |
| <b>Step 2</b>              | Safe Vehicle Speeds (S)                 | Table 3.3                   | 2                                                | Short (<20m) residential type driveway                         |
| <b>Step 3</b>              | Geometric Assessment Score (G), $G=W+S$ |                             | 4                                                | <i>Tolerable</i>                                               |
| <b>Step 4</b>              | Exposure Factor- Vehicle Volumes (EV)   | Table 3.4.1                 | 1                                                | <5 off-street car parking spaces                               |
| <b>Step 5</b>              | Exposure Factor- Path Users (EP)        | Table 3.4.2                 | 4                                                | High demand routes to school                                   |
| <b>Step 6</b>              | Exposure Factor- Driver Compliance (EC) | Table 3.4.3                 | 2                                                | Untreated driveway, staff traffic.                             |
| <b>Step 7</b>              | Exposure Score (E), $E= EV+ EP + EC$    |                             | 7                                                | <i>Moderate Exposure</i>                                       |
| <b>Level of Assessment</b> |                                         | <b>Table 4 (Figure 114)</b> | <b>Low Risk - Existing treatment Appropriate</b> |                                                                |

## 12.0 CAR PARKING

### 12.1 EXSITING CAR PARKING LAYOUT

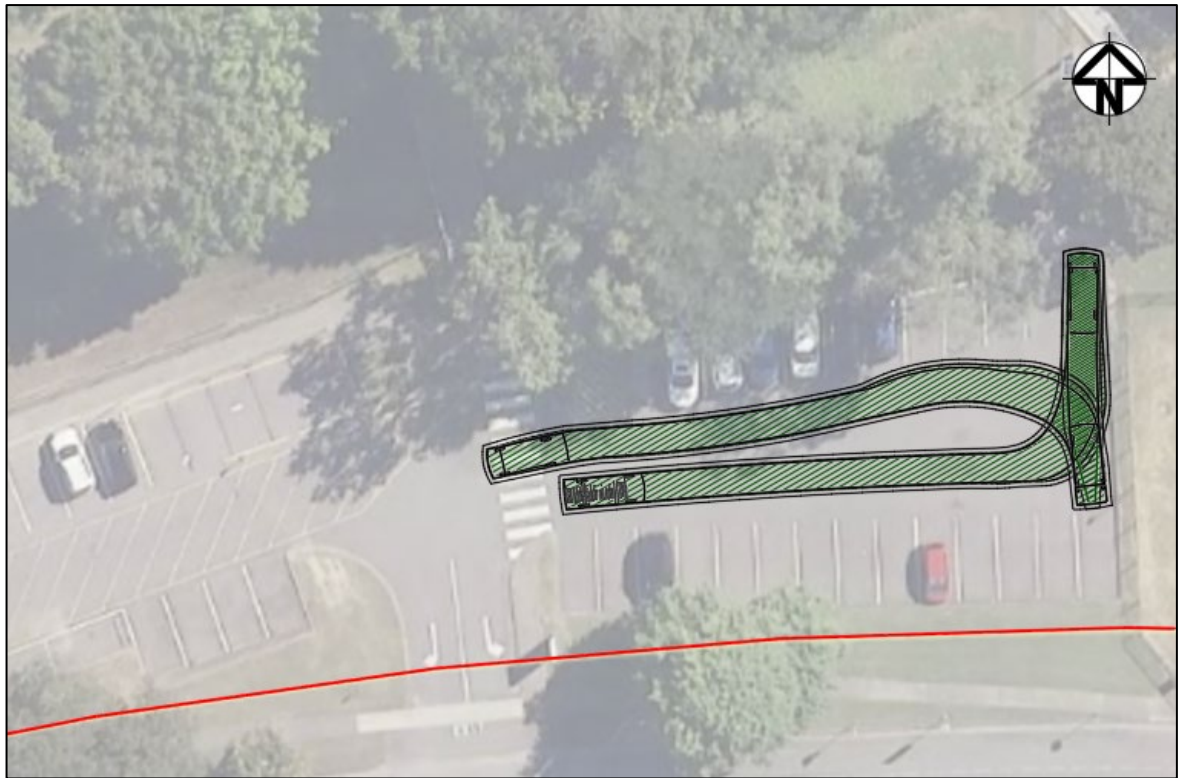
#### 12.1.1 Yolanda Drive public car park

It is understood that the existing eastern drop-off area along Yolanda Drive currently accommodates twenty-seven (27) parking spaces. AS2890.1:2004 (Part 1), off-street parking indicates that for carparks open to the public, the maximum length of the blind aisle must not exceed six (6) 90° bays plus 1m, unless provision is made for cars to turn around at the end. compliant turnaround bay at the aisle end. It is noted that the existing blind aisle exceeds the maximum length without a turnaround provision, however, it is noted that given the wide width of the aisle (7.6m at the western end and 12m at the eastern end), provides sufficient space for vehicles to safely perform a three-point turn and depart the aisle in a forward motion. This is supported by the B99 vehicle swept-path analysis shown in **Figure 127**. Additionally, due to the wide aisle, vehicles in the end bays are able to perform a straight reverse out of the end spaces and depart without the need for the 1m aisle extension as shown in **Figure 128**. As a result, a dedicated turning bay and the additional 1 m aisle extension are not considered necessary.



**Figure 127.** B99 Vehicle entering western car park access and doing a 3-point turn to exit along Site Access 3



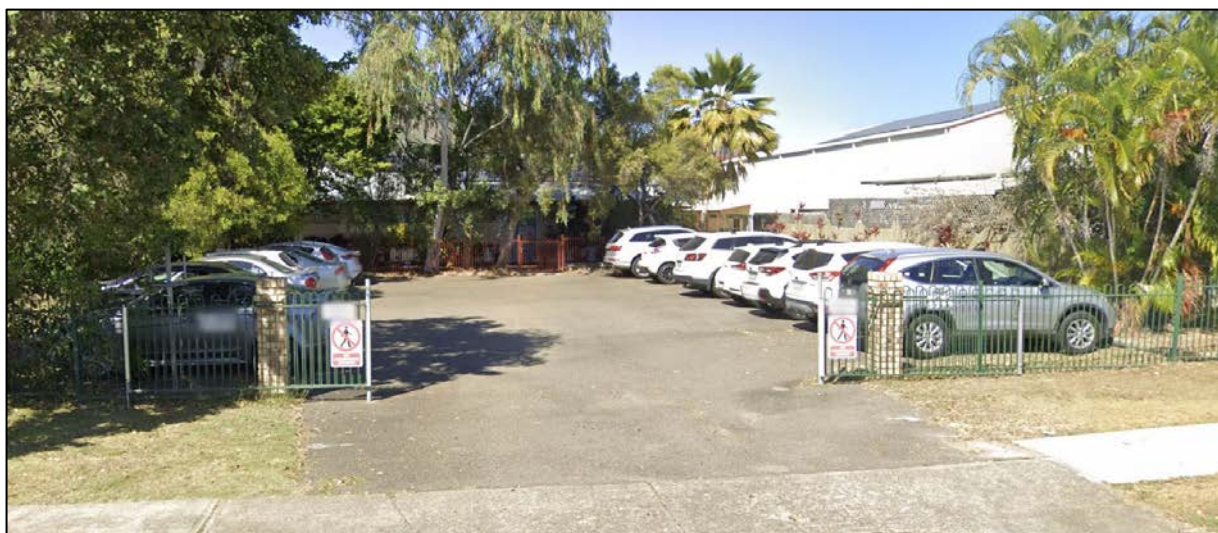


*Figure 128. B99 Vehicle departing from end bay*

### 12.1.2 Jonquil Crescent staff parking

A review of the existing staff car park along Jonquil Crescent exceeds the allowable limit of six (6) 90° bays plus 1 m, and requires a compliant turnaround bay at the end of the aisle in accordance with AS2890.1: Off-Street Parking. Additionally, the facility does not provide an accessible parking space, which is a requirement under both AS2890.1 and the National Construction Code (NCC).

To meet these standards, the parking layout is proposed to be revised by converting an end bay to a turnout bay and an existing bay into an accessible bay. It is currently unclear whether the additional 1m aisle extension is provided or can be accommodated, however, for the purpose of this assessment, has been assumed to have been provided or can be accommodated. The required adjustment is assumed to result in a reduction of the total number of parking spaces from **fourteen (14)** to **twelve (12)**. Refer to **Figure 129** for the existing staff parking street view.



*Figure 129. Existing staff car parking street view (Source: Google Maps)*

## 12.2 CAR PARKING DEMAND

It is projected that the development will ultimately have seven hundred and seventy (770) students and ninety-eight (98) full-time equivalent (FTE) staff. Refer to **Section 6.1, Table 7** for this report projected numbers. Based on the TCC Planning Scheme, SC6.10 Parking Rates planning policy the required number of parking spaces for an educational establishment is as follows:

- Primary – one (1) space per FTE employee and one (1) space per ten (10) students for visitor parking AND sufficient spaces for loading and unloading of passengers in addition to other requirements.
- Secondary – one (1) space per FTE employee, and one (1) space per ten (10) students of legal driving age, AND one (1) visitor space per fifty (50) students, and sufficient spaces for loading and unloading of passengers in addition to other requirements.
- Tertiary – point five (0.5) spaces per FTE employee plus one (1) space per ten (10) students, and sufficient spaces for loading and unloading of passengers in addition to other requirements.

As the development site caters for students from Kindergarten to Year 12, Primary school parking rates have been applied for students in Kindy to Year 6. The total projected number of Primary students (Kindy to Year 6) and Secondary students (Year 7 to Year 12) is three hundred and ninety-three (393) and three hundred and seventy-seven (377) respectively. It is assumed that 20% of the students within the secondary level are of the legal age of driving. Refer to **Table 7** of this report for the current data and projected number of students and staff. Based on these projected value, the required parking spaces have been calculated and summarised in **Table 20**.

**Table 20.** Required number of car parking spaces in accordance with TCC SC6.10 - Educational Establishment.

| Category                 | Projected No. of Students | Projected No. of Staff (FTE) | Legal Driving Age (20%) | Parking spaces required |                |                      |                      |
|--------------------------|---------------------------|------------------------------|-------------------------|-------------------------|----------------|----------------------|----------------------|
|                          |                           |                              |                         | Student Parking Spaces  | Visitor Spaces | Staff Parking Spaces | Total Parking Spaces |
| Primary (Kindy to Yr 6)  | 393                       | 50                           | -                       | -                       | 39             | 50                   | 89                   |
| Secondary (Yr7 to Yr 12) | 377                       | 48                           | 76                      | 8                       | 8              | 48                   | 63                   |
| <b>Total</b>             | <b>770</b>                | <b>98</b>                    |                         |                         |                |                      | <b>153</b>           |



As shown in **Table 20**, the proposed development requires a total of **one hundred and fifty-three (153)** parking spaces. The proposed development proposes to retain all the existing carparks and proposes to extend of the staff car parking along the eastern boundary of the subject site. The extension will allow for twenty-five (25) additional parking spaces.

The total off-street parking provided by the proposed development is **one hundred and forty-six (146) spaces**, in addition, **twenty four (24) on-street parking spaces** are available at the street frontage of the school (excluding the loading zone on Jonquil Crescent, proposed part-time parking and loading zone along Yolanda Drive), the overall parking capacity is **one hundred and seventy one (170) spaces**, as such the proposed development exceeds the minimum required car parking spaces. The existing and proposed parking areas, along with their respective counts are shown in **Figures 130 to 132**, and are summarised in **Table 21**.

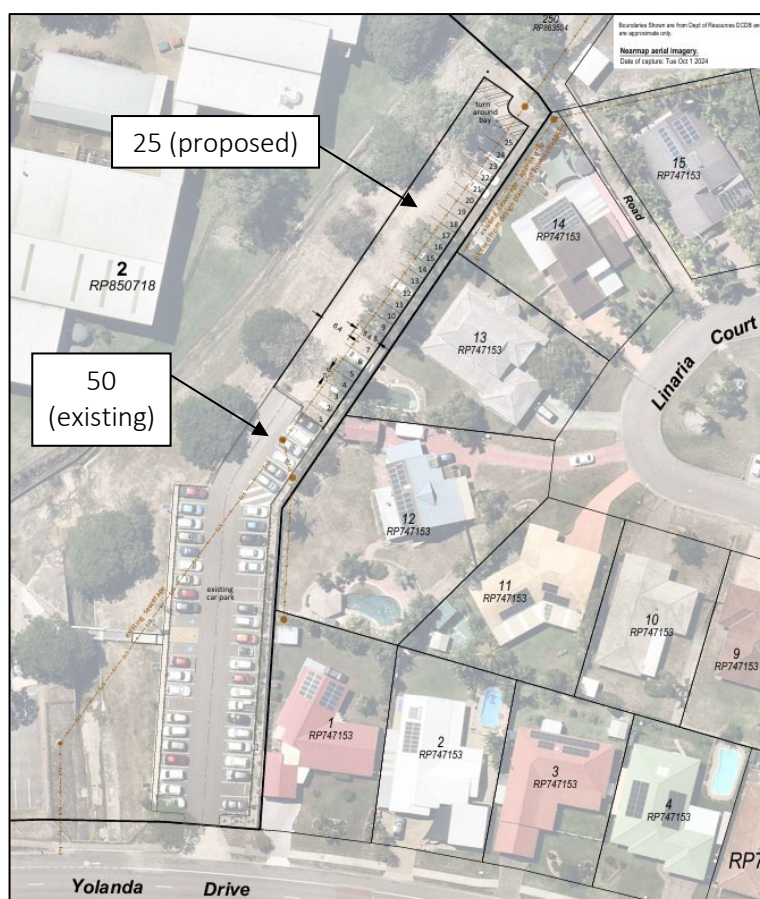


**Figure 130.** Existing off-street and on-street available car park spaces along Yolanda Drive



**Figure 131.** Existing off-street and on-street available car park spaces along Jonquil Crescent





**Figure 132.** Proposed car parking extension

**Table 21.** Proposed number of parking spaces

| Type of Parking                 | Description                                              | No. of Car Parking Spaces |
|---------------------------------|----------------------------------------------------------|---------------------------|
| Off-street parking              | Yolanda Drive Western Drop off point (Existing)          | 28                        |
|                                 | Yolanda Drive Eastern Drop off point (Existing)          | 27                        |
|                                 | Staff car parking area off Yolada Drive (Existing)       | 50                        |
|                                 | Staff car parking area off Jonquil Crescent              | 12                        |
|                                 | Acquired Land (9 Jonquil Crescent) Garage                | 2                         |
|                                 | Acquired Land (9 Jonquil Crescent) Off Street (Driveway) | 2                         |
|                                 | Car Park extension along Staff Car Parking (Proposed)    | 25                        |
| <b>Total off-street parking</b> |                                                          | <b>146</b>                |
| On-street parking               | On Jonquil Crescent fronting 9 Jonquil Crescent          | 2                         |
|                                 | On Jonquil Crescent east of Site access 5                | 3                         |
|                                 | On Yolanda Drive west of Site access 1                   | 19                        |
| <b>Total on-street parking</b>  |                                                          | <b>24</b>                 |
| <b>Total car parking spaces</b> |                                                          | <b>170</b>                |

## 13.0 SUMMARY

This report has assessed the impact of the proposed development on the existing road network. Consideration has been given to operational performance and road safety.

The summary of the findings is as follows:

- Crash data was reviewed for key intersections and site accesses. There were ten (10) recorded incidents along Yolanda Drive and two (2) along Jonquil Crescent. Amongst the twelve (12) recorded incidents, only 3 are recorded in the past 10 years. Moreover, the three (3) recent incidents appear to be isolated incidents and does not indicate any particular deficiency.
- The proposed development includes application will seek to increase enrolment and staffing numbers, a demolition and reconstruction of H Block (Heart & Hub) as well as extension of the existing car park along the eastern boundary of the site.
- A SIDRA assessment has been undertaken, and the LOS of service (LOS) at all the intersection and site access has **remained a LOS B or better during** in the base year (2027) and horizon year (2037) with development scenarios. As such the proposed development is not anticipated to impact the operation of the existing road network.
- No change to existing access turn treatment arrangements is proposed.
- Sight distance checks were conducted in accordance with AS2890.1. All the existing site access have the minimum SSD provided measures shown in **Appendix C** are implemented. The following are the summary:
  - Site access 1 meets the minimum SSD for a frontage speed of 60km/hr during the school hour zone however, outside school hour zone, the line of sight will be obstructed by the two parking west of Site Access 1. It is proposed that the two-parking line marked parking bay are provided with new signs.
  - Site access 2 is an egress only, however, AS 2890.1 SSD distance has been adopted for a vehicle to stop before collision with a pedestrian. It is recommended that no stopping sign and unbroken yellow line no stopping line be installed for approximately 14m and 7.5m from west and east of the Site access 2 respectively.
  - Site access 3 meets the minimum stopping sight distance, however it is recommended that no stopping sign and unbroken yellow line stopping line be installed approximately 16m and 17m from the western and eastern side of the Site access 3 respectively.

- Site access 4 also meets the minimum stopping sight distance, however it is recommended to install no stopping sign and unbroken yellow no stopping line 10m and 5.5m from the western and eastern of site access 4 respectively.
  - Site access 5 meets the minimum SSD or a frontage speed of 50km/hr
  - Site access 6 meet the minimum SSD, however the existing two-parking bay lined along the eastern side of site access 6 is proposed to be signed with no stopping sign during the arrival and departure of staffs.
  - Site Access 7 meets the minimum SSD and is considered to have unobstructed sight line due to minimal traffic.
- Pedestrian sight distance was also assessed in accordance with AS2890.1 and TMR guidelines. The summary of results is as follows:
  - Site access 1 – Trees along the west and east of the site access 1 was already removed and site access 1 has already been widened. Please note that the kerbside tree between site access 1 and site access 2 has a shrubby form and low branches which may potentially obstruct sight lines. It is recommended that this be replaced with a more suitable specie.
  - Site access 2 – Low risk, existing treatments is appropriate.
  - Site access 3 – It is recommended to relocate the ACC sign not less than 0.5m further to the North or to the East.
  - Site access 4 - It is recommended to mark or colour the pathway at this site access.
  - Site access 5 – Low risk, existing treatments is appropriate.
  - Site access 6 - Low risk, existing treatments is appropriate.
  - Site Access 7 - Low risk, existing treatments is appropriate.
- Summary of the proposed signs and unbroken yellow no stopping linemarking distances is attached in **Appendix C**.
- From assessment of the carparking layout, it has been identified that the existing staff parking does not meet AS2890.1 and NCC requirements. A turn around bay is required for this carpark as is an accessible parking space.
- Car parking rates assessment was completed. Assessment shows that the minimum required car parking spaces for the proposed development is **one hundred and fifty-three (153)** spaces. The available off-street parking spaces is one hundred and forty-six (146) and on-site parking spaces is twenty-four (24), having a total of **one hundred and seventy-one (170)** spaces which exceeds the minimum required.

In summary, this report has found that the proposed development is not anticipated to have any significant adverse impact on the operational performance or safety of the surrounding road network. All site accesses meet required sight distance criteria, with only minor mitigation measures (summarised in **Appendix C**) recommended to address localised visibility constraints. Pedestrian sight distance checks identified targeted improvements such as vegetation removal, signage adjustments, and low-cost pathway treatments. Parking provisions meet the minimum requirements.



## 14.0 CERTIFICATION

### Registered Professional Engineer Queensland

for

|                       |                                                                                  |
|-----------------------|----------------------------------------------------------------------------------|
| <b>Project Title:</b> | Annandale Christian College (New administration building and car park extension) |
|-----------------------|----------------------------------------------------------------------------------|

As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the *Professional Engineers Act 2002* as competent in my areas of nominated expertise, I understand and recognise:

- the significant role of engineering as a profession, and that
- the community has a legitimate expectation that my certification affixed to this engineering work can be trusted, and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

- i. I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the *Guide to Traffic Impact Assessment* published by the Queensland Department of Transport and Main Roads and using sound engineering principles, and
- ii. where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment, and that
- iii. the outcomes of this traffic impact assessment are a true reflection of results of assessment, and that
- iv. I believe the strategies recommended for mitigating impacts by this traffic impact assessment, embrace contemporary practice initiatives and will deliver the desired outcomes.

|                           |                                                                                     |                 |             |
|---------------------------|-------------------------------------------------------------------------------------|-----------------|-------------|
| <b>Name:</b>              | Brett Langtree                                                                      |                 |             |
| <b>RPEQ competencies:</b> | Civil Engineering                                                                   | <b>RPEQ No:</b> | 11932       |
| <b>Signature:</b>         |  | <b>Date:</b>    | 12 May 2026 |
| <b>Postal address:</b>    | 14 Ingham Road,<br>West End QLD 4810                                                |                 |             |
| <b>Email:</b>             | brett@langtreeconsulting.com.au                                                     |                 |             |
|                           |                                                                                     |                 |             |

# APPENDIX A

## DEVELOPMENT PLANS