Transport Strategy

1-3 Azalea Street, Mullumbimby NSW

Prepared for Byron Shire Council
By Planit Consulting Pty Ltd

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Executive Summary

This Transport Strategy (TS) has been prepared to inform Byron Shire Council's assessment into rezoning the former hospital site at 1-3 Azalea St, Mullumbimby NSW.

Under this proposal, the site is to be rezoned from SP2 infrastructure to R1 Residential. It is expected that rezoning could potentially yield up to 130 occupancies with a combination of residential housing, mixed development for community use and landscaping. It is envisioned that the residential component shall incorporate 20% affordable housing.

Future traffic volumes generating by the site have been estimated as below. This constitutes a 'moderate' to 'high' impact.

- AM Peak: + 46-63 trips/h
- PM Peak + 35-66 trips/h
- AADT: + 412-638 trips/day

It was determined that the roads within the direct vicinity of the site (Azalea Street and Left Bank Road) operate at the upper end of their estimated capacities. Intersection modelling shows that the two key intersections within the vicinity of the site (Coolamon Scenic Drive/ Jubilee Avenue/ Azalea Street and Azalea Street/ Left Bank Road) have adequate capacity to accommodate the rezoning proposal.

Concept plans for upgrading the Scenic Drive/ Jubilee Avenue/ Azalea Street to a roundabout were assessed and it was determined that small improvements in traffic flow will be the resultant.

Based on a search in the TfNSW crash data no significant history of adverse safety was identified within the road network near the site. Regular congestion seems to occur. It is hypothesised that the root cause of this congestion is the school zone located north of the Scenic Drive/ Jubilee Avenue/ Azalea Street intersection.

It is anticipated that compared to typical subdivision standards, traffic within the future site will be relatively modest (approximate AADT of 600). Accordingly, the internal road hierarchy will likely be:

- 1x Central Road within the site to 'local street' standards; and
- Remaining roads within the site to be to 'access street' 'laneway' standards:
  - Where suitable, roads to be laid out as shared zones.

The future design of the road hierarchy should be supported by a Local Area Traffic Management (LATM) plan.

Potential locations for vehicular access to the site include:

- Option 1, via Azalea Street towards the west of the site;
- Option 2, via Left Bank Road towards the south of the site; and
- Option 3, via Azalea Street towards the north of the site .

It is anticipated that a minimum of 2x access points are required to service the site, including at least one access point onto Left Bank Road.

It is anticipated that the total parking demand for the future site is 195 spaces, which shall be supplied through a combination of designated resident-only parking areas; private garages attached to occupancies; and visitor Parking via internal on-street parking throughout the site and designated visitor parking areas.

To meet the demand for accessible parking, 10 accessible parking spaces will be required to meet the demand for 10 accessible/ adaptable units. It is advised that at least two of the visitor parks are designated as accessible.

To adequately support the affordable housing component of the proposal, a public transport strategy is required. It is suggested that a bus stop is incorporated into the future design of the site.

Further provisions for alternative means of transport to be incorporated into future design include:

- A suitable internal pedestrian circulation network;
- Continuation of pedestrian and cyclist networks external of the site;
- Carpooling/ rideshare provisions; and
- Suitable resident bicycle storage.

Based on Planit's assessment, it was determined that the rezoning proposal would not result in significant adverse effects on traffic flows within the vicinity of the site and that impacts can be adequately mitigated.

1 Introduction

1.1 Project Background

This Transport Strategy (TS) has been prepared to inform Byron Shire Council's assessment into rezoning the former hospital site at 1-3 Azalea St, Mullumbimby NSW. Planit was engaged by Byron Shire Council (BSC) to assess and report on the traffic related issues associated with this proposal.

Table 1: Site Details Summary

Component	Details
Street Address	1-3 Azalea St, Mullumbimby NSW 2482
Map Reference	Lot 188 on DP 728535 Lot, DP on 1159861, Lot 138 on DP 755722
Local Government Area	Byron Shire Council (BSC)
Zoning	SP2 – to be rezoned to R1
Proposed development type	Residential land development, Mixed Development, Parkland
Site Area	3.5ha, as shown in Figure 1 (hatched section excluded)

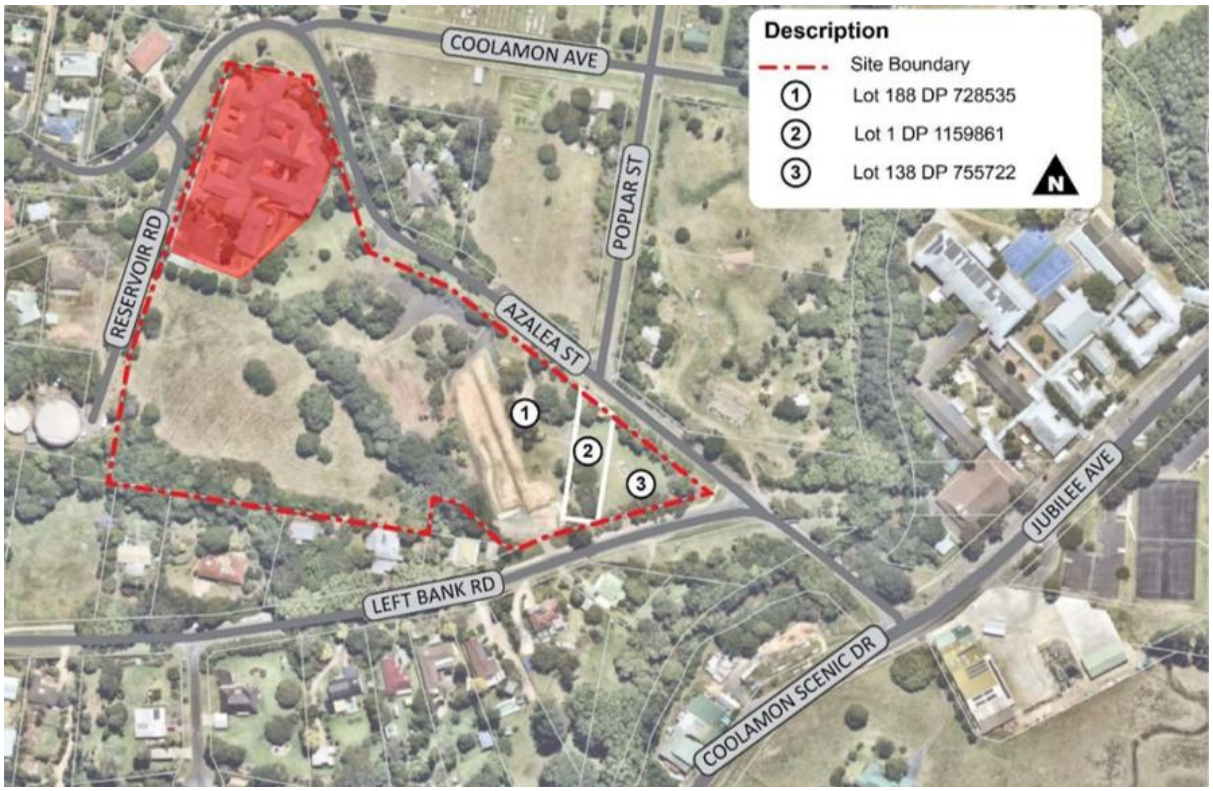

Figure 1: Site Location

BSC is considering a proposal for the rezoning of 1-3 Azalea St, Mullumbimby NSW 2482, more commonly known as the former Mullumbimby hospital site. Under this proposal, the site is to be rezoned from SP2 infrastructure to R1 Residential. It is expected that rezoning could potentially yield up to 130 occupancies. In support of the proposal, this TS aims to:

- Anticipate traffic and transport implications of the proposal;
- Assess the opportunities and constraints associated with the site; and
- Detail infrastructure improvements required to accommodate the proposal.

1.2 Project Scope

This Assessment incorporates:

- Description of the development site and proposal;
- Assessment of the existing road network surrounding the site including Left Bank Road; Azalea Street; Coolamon Avenue; and Jubilee Avenue/ Coolamon Scenic Drive
- Quantitative road network analysis incorporating:
  - Existing traffic volumes and likely growth;
  - Traffic volumes associated with the estimated development yield; and
  - Capacity of the existing road network and assessment of the impact associated with the estimated development yield:
    - Estimate additional traffic on the surrounded roads
    - Intersection assessment (SIDRA Modelling); and
    - Impact of potential intersection upgrades.
- Road Safety Considerations;
- Internal road hierarchy strategy;
- Local Area Traffic Management;
- Parking requirements and strategy for meeting parking demand;
- Public Transport and alternative means of transport; and
- Conclusion and recommendations.

1.3 Definitions

- Design Year, standard practice in traffic engineering is to determine the impact of a development 10-years after the date of the assessment.
- Level of Service (LOS), qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and\or passengers. A LOS descriptor generally describes these conditions in terms of factors such as speed and travel time, delay, density, freedom to manoeuvre, traffic interruptions, comfort, and convenience, and delay. LOS can be described for interrupted flow facilities as below:

LOS	Uninterrupted flow facility definition (*HCM 2010)	Interrupted flow facility definition (**AGTTM3)
A	Condition of free flow where individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.	Primarily free-flow operation. Vehicles are completely unimpeded in their ability to manoeuvre within the traffic stream. Control delay at the boundary intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
B	In the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is a little less than with level of service A.	Reasonably unimpeded operation: ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.
C	In the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.	Stable operation. The ability to manoeuvre and change lanes at mid segment locations may be more restricted than LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D	Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.	A less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed.
E	Traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause breakdown.	Unstable operation and significant delay. Operations may be due to a combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed.
F	In the zone of forced flow, where the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.	Flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queueing. The travel speed is 30% or less of the base free-flow speed. The through movement at one or more boundary intersections has a volume-to-capacity ratio greater than 1.0.

2 Site and Development Description

2.1 Site Description

The subject site Figure 2) is located at 1-3 Azalea St, Mullumbimby and consists of three allotments:

- Lot 188 on DP 728535 (Labelled as Lot 1 in Figure 2):
  - Total Area is 35,120m^2;
  - Mainly flat land with steep grades towards the northwest
  - Scattered vegetation including a vegetated gully ; and
  - The north western portion of the site is developed and contains the Catholic Health Care Facility (Coolamon Villa).
- Lot 1 DP on 1159861 (Labelled as Lot 2 in Figure 2):
  - Total Area is 1,331m^2; and
  - Generally flat with less developed vegetation
- Lot 138 on DP 755722 (Labelled as Lot 3 in Figure 2):
  - Total Area is 1,819m^2; and
  - Generally flat with less developed vegetation

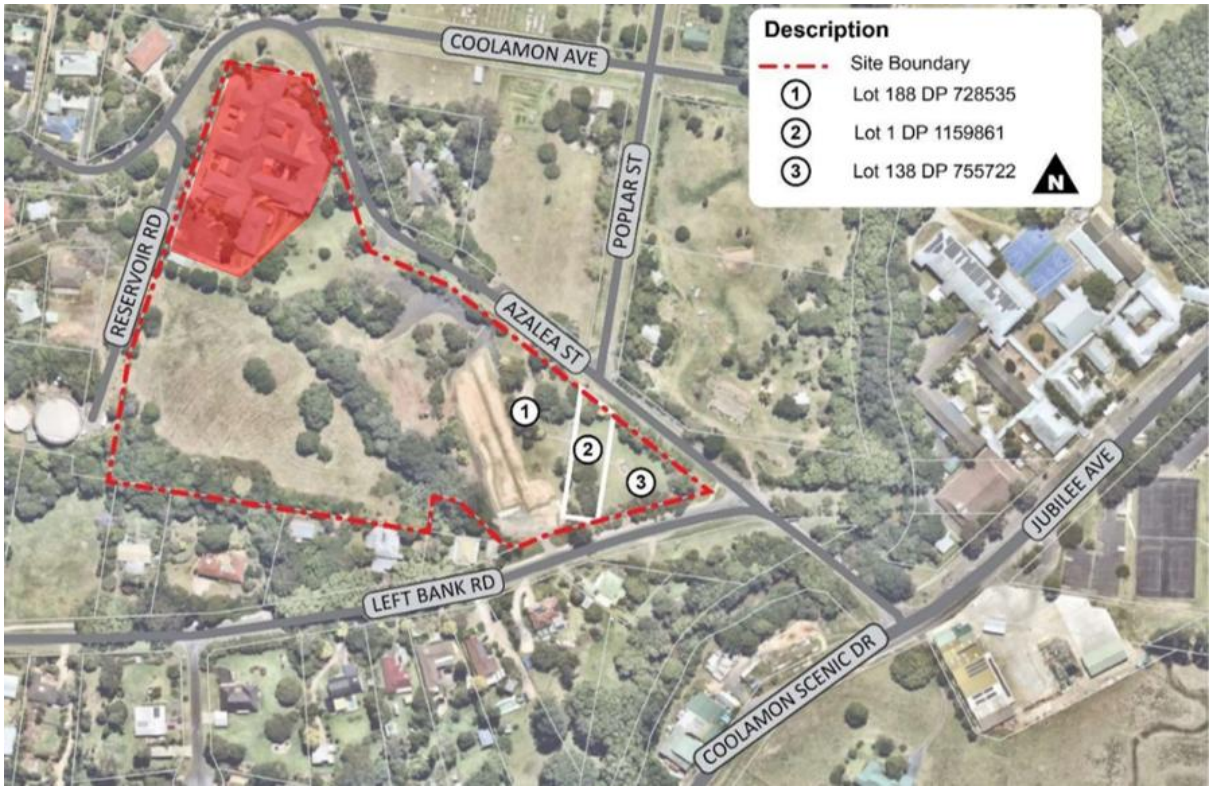

Figure 2: Site Boundary (Source, Byron Shire Council, 2022)

The total area for the Former Mullumbimby Hospital Redevelopment (Figure 2) is 38,270m^2 or approximately 3.5 hectares. This excludes the hatched area to the north of the site which houses Coolamon Village. The site is located approximately 1.2km to the southwest of the Mullumbimby town centre and is directly adjacent to Azalea Street to the North, Left Bank Road to the south and Reservoir Road to the west. The surrounding land uses are predominantly rural residential and residential, including relatively new urban release areas.

A site analysis plan obtained from Byron Shire Council is presented in Figure 3.

Figure 3: Site Analysis Plan (Source, Byron Shire Council, 2022)

2.2 Description of the Proposal

It is anticipated that through rezoning the site, a total yield of up to 130 occupancies can be achieved. Based on preliminary advise by Planit's urban designer, this would require predominantly high-density type development, with some potential for medium-density type development. It is understood that the anticipated use of the site (Figure 4) would be a combination of:

- Residential housing.
- Mixed development for community use; and
- Vegetation landscapes.

For the purpose of this assessment, two scenarios for residential density were provided, a higher-impact and a lower-impact option. There two options were provided to highlight the impacts of different development opportunities.

For the high-density option, it is assumed that 20% is affordable housing with the remainder being high density apartments. The breakdown is as follows:

- Affordable housing: 20 units;
- High density apartments: 80 high-density units; and
- Existing retirement village: 30 occupancies.

For the lower-density option, it is assumed that 20% is affordable housing with the remainder being low-density dwellings. The breakdown is as follows:

- Affordable housing units: 20 units;
- Low density dwellings: 80 dwellings ;and
- Existing retirement village: 30 occupancies.

Figure 4: Proposed Development (Source, Byron Shire Council, 2022)

3 Traffic Volumes

3.1 Existing Traffic Volumes

Based on traffic counts obtained by Council, existing traffic volumes on the surrounding road network were determined. These volumes are presented in table 2. Data obtained from Council represents AM and PM peak data. For conversion from AM peak to AADT data, a conversion factor of 10.4 was applied.

Table 2: Existing Traffic Within the Proximity of the Development Site

Road	AM Peak	PM Peak	AADT (Estimate)
Azalea Street (North of Left Bank Road)	88 trips/h	115 trips/h	915 trips/day
Azalea Street (South of Left Bank Road)	479 trips/h	460 trips/h	4,981 trips/day
Left Bank Road	409 trips/h	373 trips/h	4,254 trips/day
Jubilee Avenue	816 trips/h	919 trips/h	8,486 trips/ day
Coolamon Scenic Drive	527 trips/h	629 trips/h	5,481 trips/day

Traffic data was collected in 2022, 6 years after the Mullumbimby Hospital was decommissioned in 2016. Accordingly, the data collected represents a scenario where the subject site does not generate any traffic.

In addition, the area within the vicinity of the site has been subject to significant development over recent years. It is therefore assumed that any capacity of the road network that has been 'freed up' as a result of decommissioning the hospital has been allocated for in the current scenario.

Accordingly, any 'pre-development'/'existing' scenarios analysed in the study do include any traffic associated with the former hospital (i.e. it is assumed that the site in its existing scenario generates zero traffic).

However, at the time of study, the retirement village to the north of the site was in operation. Accordingly, it is assumed the 30 occupancies associated with this part of the proposal has been catered for in the obtained traffic counts.

3.2 Traffic Volumes Associated with The Proposal

Traffic volumes generating by the site for the low-density and high-density scenarios have been estimated using the 2002 TfNSW 'Guide to Traffic Generating Development' including the 2013 update (Technical Direction 2013/04a) and are presented in Table 3 and 4 respectively.

Table 3: Traffic Volumes Generated by the Proposed Development – Low-Density Scenario

Component	Rate	Provision in Development	Traffic Volume
AM Peak			trips/h
Affordable Housing (20%)	0.27 trips/dwelling/h*	20	6 trips/h
Low Density Residential	0.71 trips/dwelling/h	80	57 trips/h
PM Peak			trips/h
Affordable Housing (20%)	0.16 trips/dwelling/h*	20	4 trips/h
Low Density Residential	0.78 trips/dwelling/h	80	62 trips/h
Daily Trips			trips/h
Affordable Housing (20%)	2.29 trips/dwelling/day*	20	46 trips/day
Low Density Residential	7.4 trips/dwelling/day	80	592 trips/day

* Assumed to be 0.5 x high-density residential

Table 4: Traffic Volumes Generated by the Proposed Development – High-Density Scenario

Component	Rate	Provision in Development	Traffic Volume
AM Peak			trips/h
Affordable Housing (20%)	0.27 trips/dwelling/h*	20	6 trips/h
High Density Residential	0.53 trips/dwelling/h	80	43 trips/h
PM Peak			trips/h
Affordable Housing (20%)	0.16 trips/dwelling/h*	20	4 trips/h
High Density Residential	0.32 trips/dwelling/h	80	26 trips/h
Daily Trips			trips/h
Affordable Housing (20%)	2.29 trips/dwelling/day*	20	46 trips/day
High Density Residential	4.58 trips/dwelling/day	80	366 trips/day

* Assumed to be 0.5 x high-density residential

Traffic rates for affordable housing were obtained as follows:

- Base rates were obtained from TDT 2013/04a from the guide for traffic generating developments. High density regional housing was assumed;
- Based a comparison of the affordable housing SEPP and the Byron Bay DCP, it was determined that the typical parking demand for affordable housing is approximately 0.2 x (boarding housing, 0.5x (1 bedroom), 2x (2 bedroom) and 0.75x (3+ bedroom) that of 'regular' housing; and
- Based on a (assumed) direct correlation between parking and traffic generation, a traffic generation of 0.5x that of regular housing was assumed.

3.3 Impact of Proposal

For the purpose of this TS, two scenarios for residential density were provided, a higher impact and a lower impact option.

Development Impact – Low Density Scenario

Based on the estimates presented in this section of the report, it is believed that the proposed higher-density development will result in the following increases in traffic volumes generated by the site:

- AM Peak: + 63 trips/h
- PM Peak + 66 trips/h
- AADT: + 638 trips/day

In accordance with Clause 2 of Section B.2.14 of the DCP, this constitutes a 'high' impact.

Development Impact – High Density Scenario

Based on the estimates presented in this section of the report, it is believed that the proposed lower-impact development will result in the following increases in traffic volumes generated by the site:

- AM Peak: + 46 trips/h
- PM Peak + 35 trips/h
- AADT: + 412 trips/day

In accordance with Clause 2 of Section B.2.14 of the DCP, this constitutes a 'moderate' to 'high' impact.

4 Review of Existing Road Network

Figure 5 identifies the surrounding road network including key intersections. The following network components are considered in this assessment:

- Azalea Street;
- Left bank Road
- Coolamon Scenic Drive/ Jubilee Avenue;
- Intersection between Azalea Street and Left Bank Road (IC02); and
- Intersection between Azalea Street and Coolamon Scenic Drive/ Jubilee Avenue (IC01).

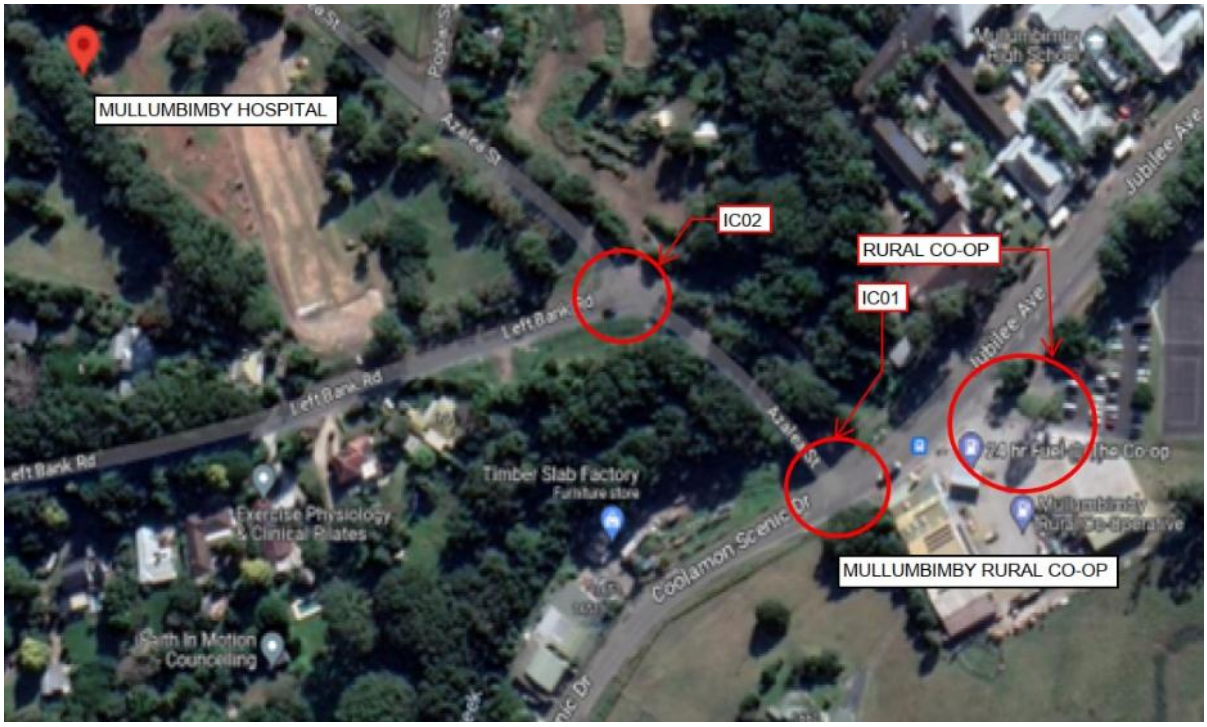

Figure 5: Surrounding Road Network Adapted from Google Maps, 2023)

4.1 Road Network

Coolamon Scenic Drive / Jubilee Avenue
Coolamon Scenic Drive (Changes into Jubilee Avenue west of Azalea Steet) is a two-way street consisting of a >10m wide sealed pavement with intermittent kerb. East of Azalea Street, there is a footpath on the northern side of the road and provisions are made for on-street parking. There is no footpath west of Azalea Street. Its arrangement is consistent with the standards for a 'collector'/ 'distributor' road. Based on the Northern Rivers Local Government (NRLG) design manual, the capacity of such a road is around 3000-4000 trips per day. Accordingly, it appears that the road operates at the upper end of its capacity.

Azalea Street
Azalea Street connects Coolamon Scenic Drive to the subject site. The road assembly consists of a two-way 7.5 m wide sealed road with no kerb. A shared path is located on the eastern side of the road. This is consistent with the standards for a local road. To the south of Left Bank Road, the road widens to 11m, which is consistent with a collector road. The approximate capacity of such a road is 3000 trips/ day, which approximately equals the capacity of a 'collector' road.

Left Bank Road

Left bank road is a local road branching off from Azalea Street. It runs along the side of the proposed development. It is a typical two-way street consisting of an 8.5m wide sealed pavement with a kerb. This is consistent with the standards for a local road. The approximate capacity of such a road is 2000 trips/ day, which is considerably less than the estimated daily traffic.

4.2 Key Intersections

IC01 Intersection

The intersection IC01 between Coolamon Scenic Drive /Jubilee Avenue and Azalea Street (Figure 6) is considered a key intersection for traffic flows within the locality. Coolamon Scenic Drive is the main road connecting the subject site to the Mullumbimby town centre.

Figure 6: Coolamon Scenic Dr/Jubilee Ave/Azalea Street Intersection

Intersection counts were obtained from Byron Shire Council, which are summarised in Table 5

.

Table 5: Traffic Volumes Gathered at IC01

Intersection Leg	Movement	AM Peak	PM Peak
Jubilee Avenue	Westbound (straight)	170 trips/h	287 trips/h
	Northbound (right turn)	170 trips/h	176 trips/h
	Southbound (left turn)	0 trips/h	1 trips/h
	Eastbound (U-turn)	0 trips/h	0 trips/h
Coolamon Scenic Drive	Eastbound (straight)	263 trips/h	265 trips/h
	Southbound (right turn)	0 trips/h	42 trips/h
	Northbound (left turn)	45 trips/h	0 trips/h
	Westbound (U-turn)	0 trips/h	0 trips/h
Azalea Street	Southbound (straight)	0 trips/h	0 trips/h
	Westbound (right turn)	49 trips/h	35 trips/h
	Eastbound (left turn)	213 trips/h	190 trips/h
	Northbound (U-turn)	0 trips/h	0 trips/h
Private Residence	Northbound (straight)	0 trips/h	0 trips/h
	Eastbound (right turn)	0 trips/h	0 trips/h
	Westbound (left turn)	0 trips/h	0 trips/h
	Southbound (U-turn)	0 trips/h	0 trips/h

SIDRA 9.0 Intersection modelling software has been utilised to develop and analyse and model the performance for the intersection for the present and a 10-year horizon time period between 2025 (Predicted year of operation) and 2035 (10-Year Horizon).

The relevant modelling scenarios are based on the following questions and assumptions:

- How does the intersection perform with existing conditions at the assumed time of occupation of the proposed development (2025) and in the t+10th (2035) design year, adopting an assumed 2.5% annual compound traffic growth rate?
- How does the intersection perform in 2025 and 2035 with post development traffic added and are there any additional intersection upgrades required?

For traffic on Azalea Street and Coolamon Scenic Drive an approach speed limit of 50km/h was assumed and for traffic on Jubilee Avenue an approach speed limit of 40km/h was assumed. The following key performance indicators were adopted when deciding whether a modelling scenario is a 'pass' or 'fail':

- Level of Service (LOS) on an intersection;
- Degree of Saturation (DOS); and
- Queuing Proportion.

SIDRA 9.0 Intersection Lane summaries outputs for each scenario are provided in Appendix A. The model setup is presented in Figure 7.

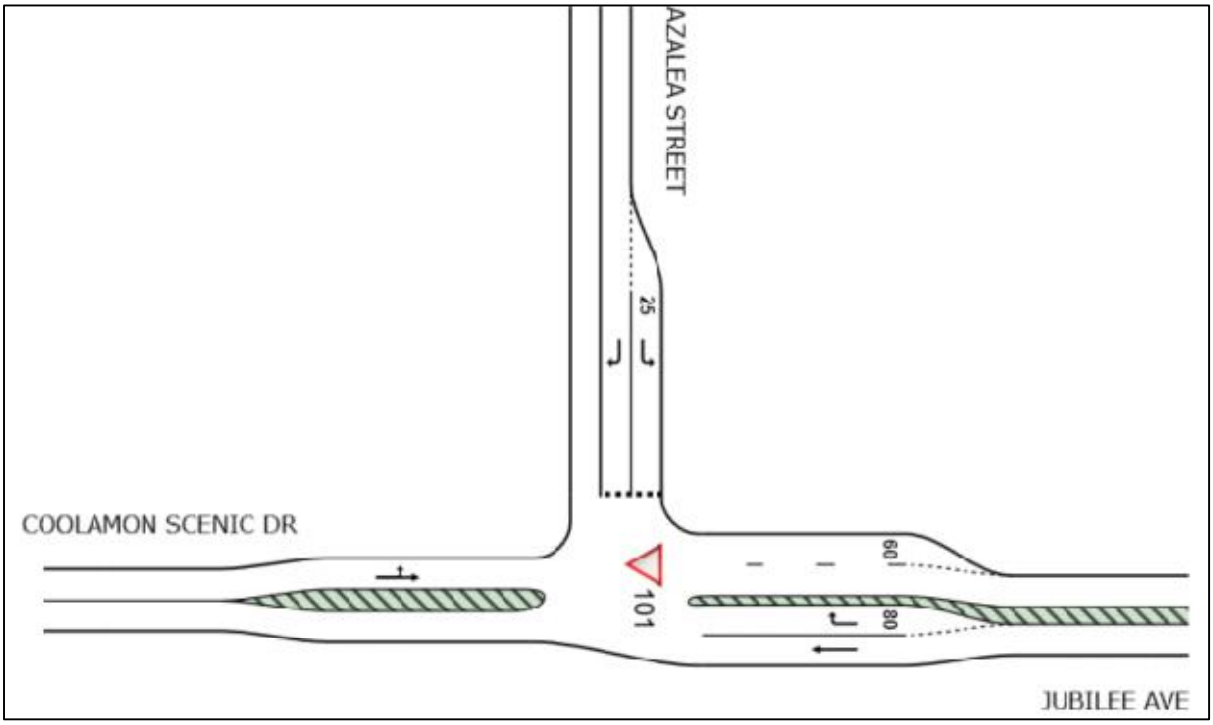

Figure 7: Coolamon Scenic Dr/Jubilee Ave/Azalea Street Intersection SIDRA Setup

The following scenarios were modelled:

- Scenario 1: Time of Completion (2025), without the development impact (Figure 8);
- Scenario 2: Ultimate Planning Horizon (2035), without development impact (Figure 9);
- Scenario 3: Time of Completion (2025), including development impact (Figure 10); and
- Scenario 4: Ultimate planning Horizon (2035), including development impact (Figure 11).

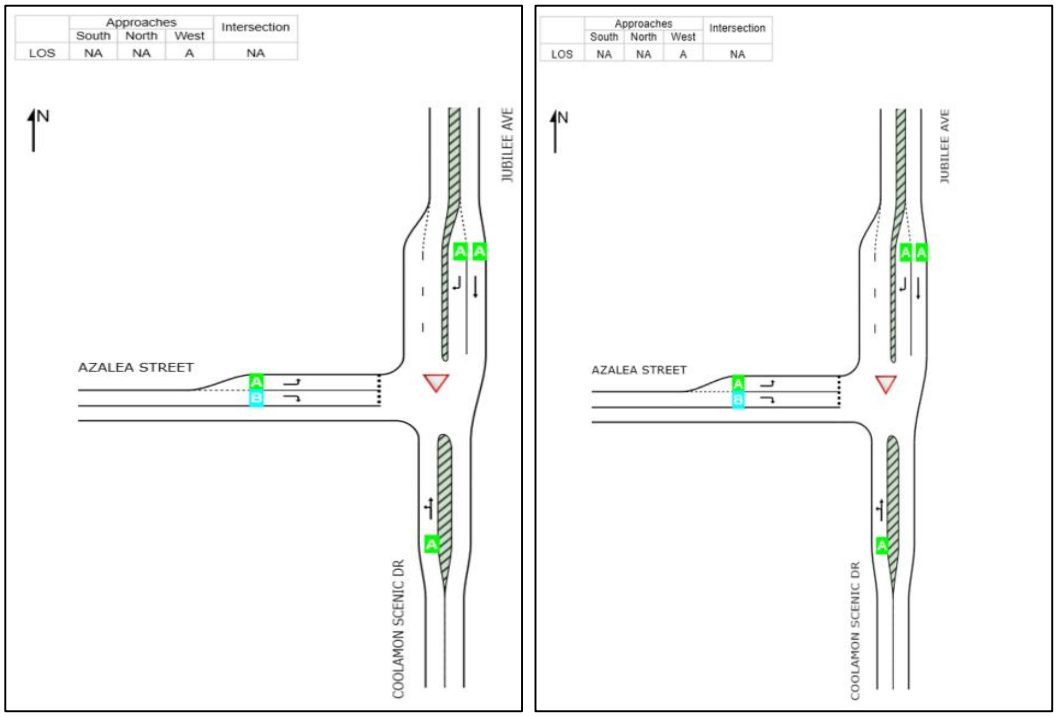

Figure 8: IC01 Results for Scenario 1 – 2025 Without Development Impact AM (Left) and PM (Right)

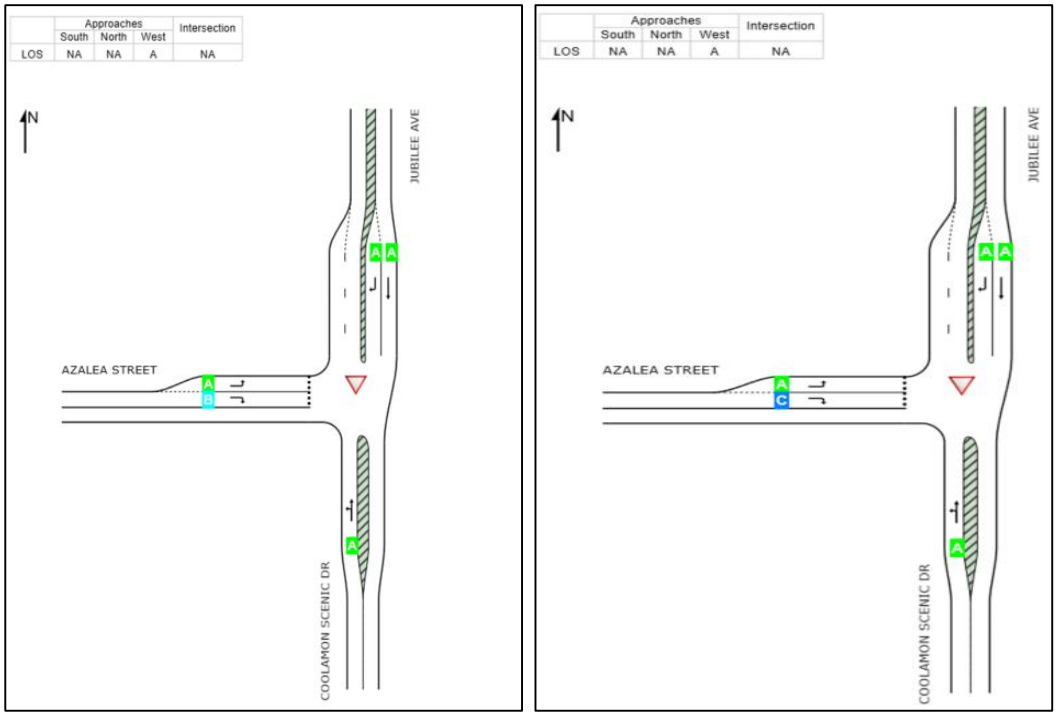

Figure 9: IC01 Results for Scenario 2 – 2035 Without Development Impact AM (Left) and PM (Right)

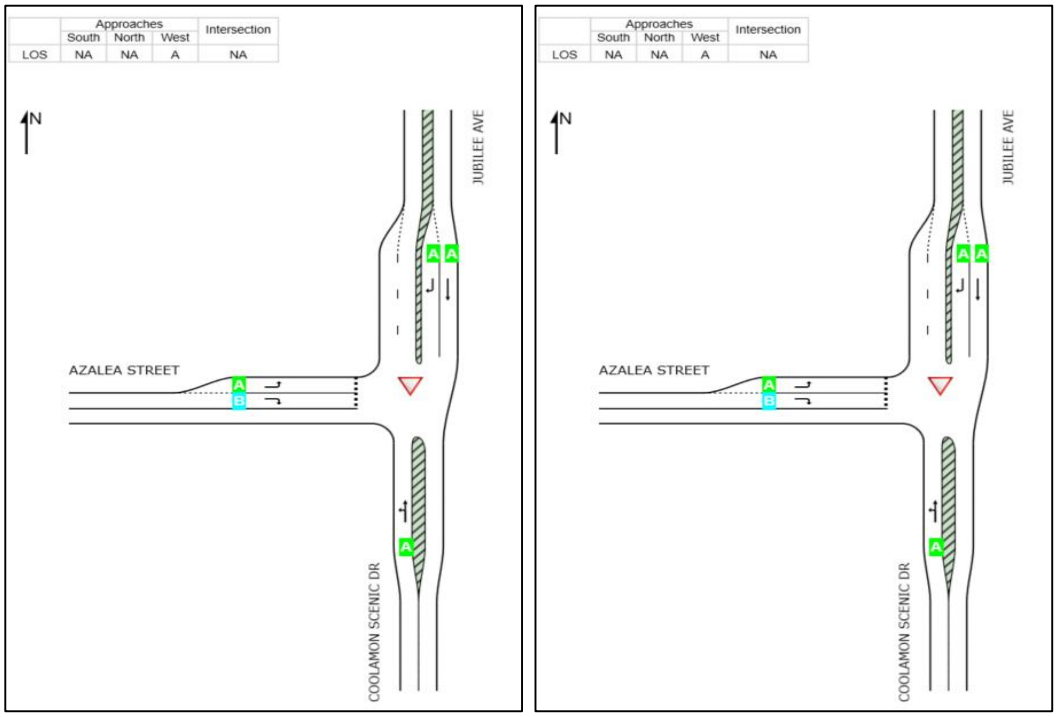

Figure 10: IC01 Results for Scenario 3 – 2025 With Development Impact AM (Left) and PM (Right)

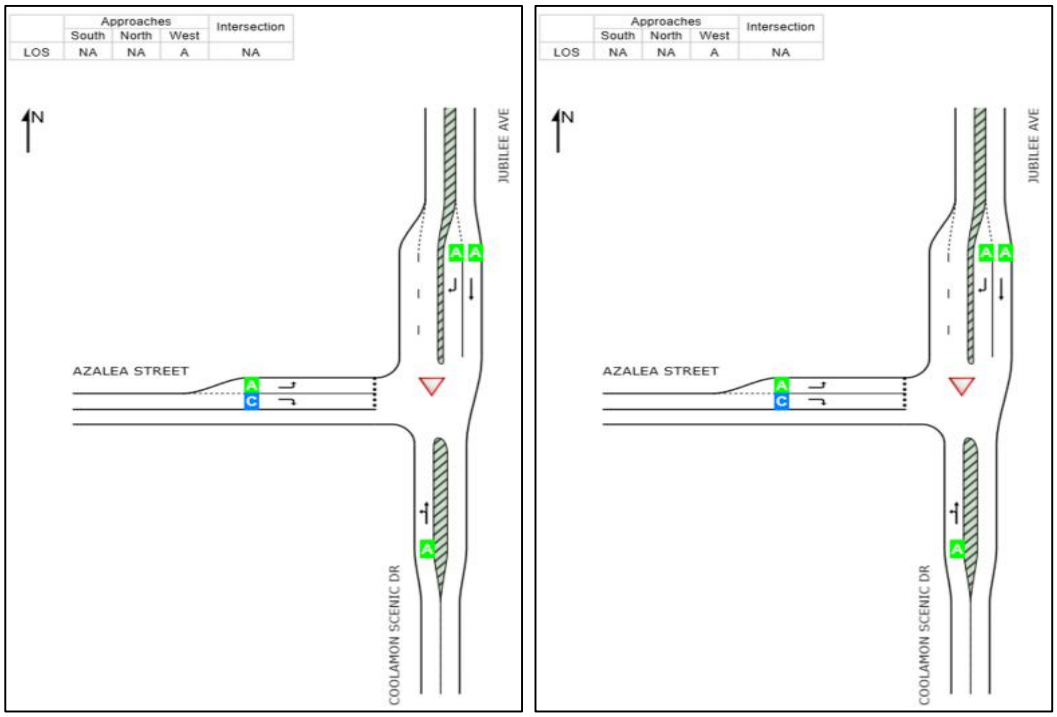

Figure 11: IC01 Results for Scenario 4 – 2035 With Development Impact AM (Left) and PM (Right)

From the modelling results, it is evident that:

- The no-development scenarios achieve a LOS A for most approaches both in 2025 and 2035. The LOS for traffic turning right from Azalea Street onto Coolamon Scenic Drive is typified by LOS B in 2025, which is expected to slightly deteriorate to a level C (PM only) in 2035; and

- The developed scenario shows minimal impact compared to the no-development scenario with as light worsening to a LOS C for traffic turning right from Azalea Street onto Coolamon Scenic Drive.

The following should be noted based in experience and observations:

- Significant traffic delays are experienced within the vicinity of this intersection. This is further noted in Section 5.2 of this report;
- Based on SIDRA modelling, the capacity of intersection arrangement is unlikely to be the main cause of these delays;
- The unregulated crossing near the school, located approximately 200m to the north of the intersection is likely the main cause of delay during peak traffic periods, which coincide with school drop-off and pick-up times; and
- It is considered unlikely that Intersection upgrades will ease this issue. Augmentation of the school drop-off and pick-up area may be considered for future investigation. Potential solutions may include:
  - Pedestrian traffic lights;
  - Using a stop/go person;
  - Over/under passes;
  - alternate bus routes; and
  - Designated drop-off and pick-up zones.

IC02 Intersection
The intersection IC02 (Azalea Street/Left Bank Road) (Figure 12) is the intersection closest to the proposed Mullumbimby Hospital Location.

Figure 12: IC02 Intersection

Intersection counts were obtained from Byron Shire Council, which are summarised in Table 6.

Table 6: Traffic Volumes Gathered at IC02

Intersection Leg	Movement	AM Peak	PM Peak
Azalea Street (South)	Northbound (straight)	35 trips/h	44 trips/h
	Westbound (left turn)	188 trips/h	188 trips/h
	Southbound (U-turn)	0 trips/h	0 trips/h
Azalea Street (North)	Southbound (straight)	44 trips/h	47 trips/h
	Westbound (right turn)	4 trips/h	4 trips/h

Intersection Leg	Movement	AM Peak	PM Peak
Left Bank Road	Northbound (U-turn)	0 trips/h	1 trips/h
	Southbound (right turn)	220 trips/h	171 trips/h
	Northbound (left turn)	5 trips/h	10 trips/h
	Westbound (U-turn)	0 trips/h	0 trips/h

SIDRA 9.0 Intersection modelling software has been utilised to develop and analyse and model the performance for the intersection for the present and a 10-year horizon time period between 2025 (Predicted year of operation) and 2035 (10-Year Horizon).

An approach speed limit of 40km/h was assumed. The following key performance indicators were adopted when deciding whether a modelling scenario is a 'pass' or 'fail':

- Level of Service (LOS) on an intersection;
- Degree of Saturation (DOS); and
- Queuing Proportion.

SIDRA 9.0 Intersection Lane summaries outputs for each scenario are provided in Appendix A. The model setup is presented in Figure 13.

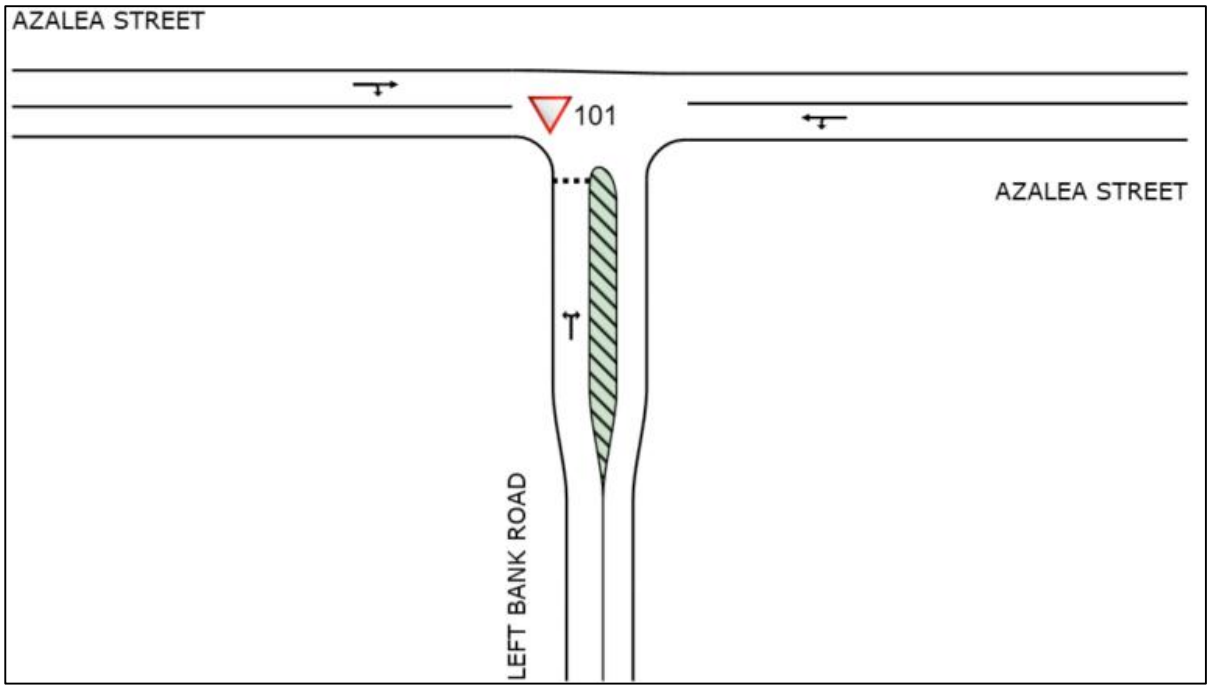

Figure 13: Azalea Street/ Left Bank Road Intersection SIDRA Setup

The following scenarios were modelled:

- Scenario 1: Time of Completion (2025), without the development impact (Figure 14);
- Scenario 2: Ultimate Planning Horizon (2035), without development impact (Figure 15);
- Scenario 3: Time of Completion (2025), including development impact (Figure 16); and
- Scenario 4: Ultimate planning Horizon (2035), including development impact (Figure 17).

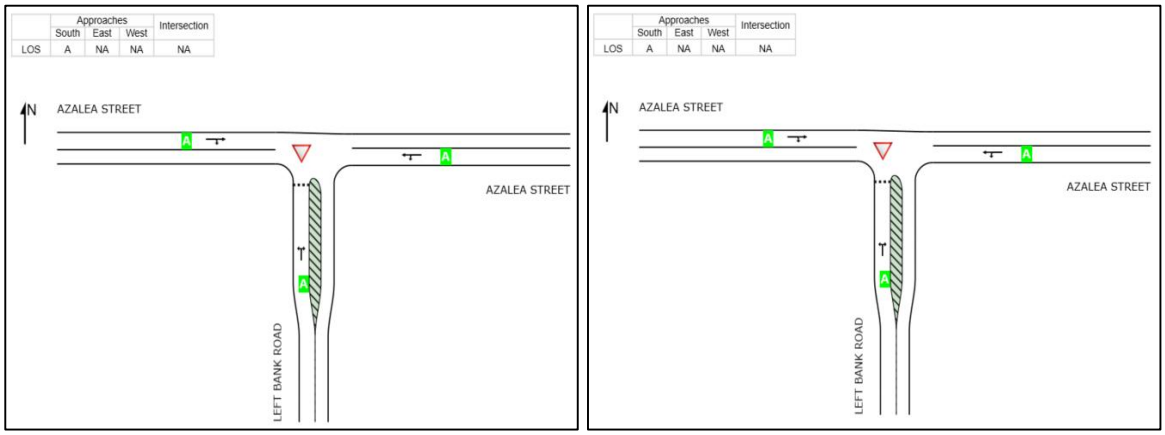

Figure 14: IC01 Results for Scenario 1 – 2025 Without Development Impact AM (Left) and PM (Right)

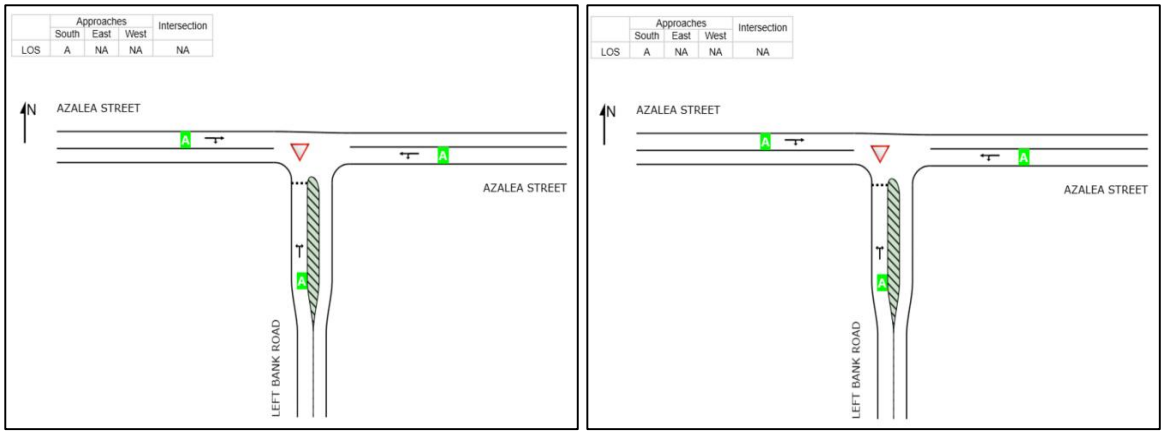

Figure 15: IC01 Results for Scenario 2 – 2035 Without Development Impact AM (Left) and PM (Right)

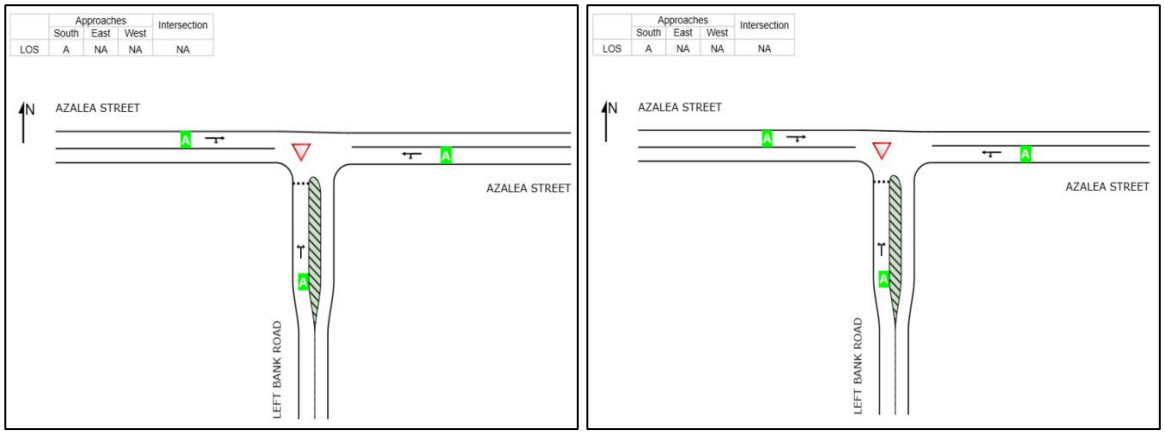

Figure 16: IC01 Results for Scenario 3 – 2025 With Development Impact AM (Left) and PM (Right)

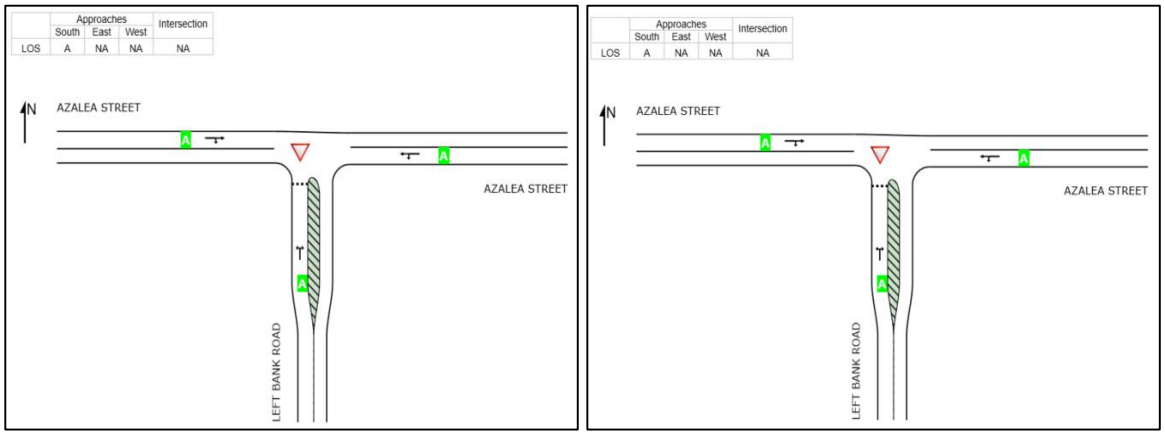

Figure 17: IC01 Results for Scenario 4 – 2035 With Development Impact AM (Left) and PM (Right)

From the modelling results, it is evident that:

- The no-development scenarios achieve a LOS A for all approaches both in 2025 and 2035; and
- A LOS A is maintained for all approaches in the developed scenario both in 2025 and 2035.

From the traffic counts and intersection movements, it is noted that the dominant direction for traffic is between the southern leg of Azalea Street and Left Bank road. Future investigations may be conducted into amending the intersection priority to reflect this. Requirements will likely include:

- Revise road geometry to link Azalea Street (South) and Left Bank Road with a corner;
- Corner radius to be maximised within the constraints of the road reserve;
- As the radius will likely be uncompliant, traffic calming strategies should be implemented. These may include signage, physical speed humps and/ or CAM's; and
- Link the northern leg of Azalea Street via a new arrangement and provide right-of-way signage.

4.3 Future Intersection Upgrades

Concepts for a roundabout upgrade of intersection between Coolamon Scenic Drive /Jubilee Avenue and Azalea Street were obtained by Council (Figure 18).

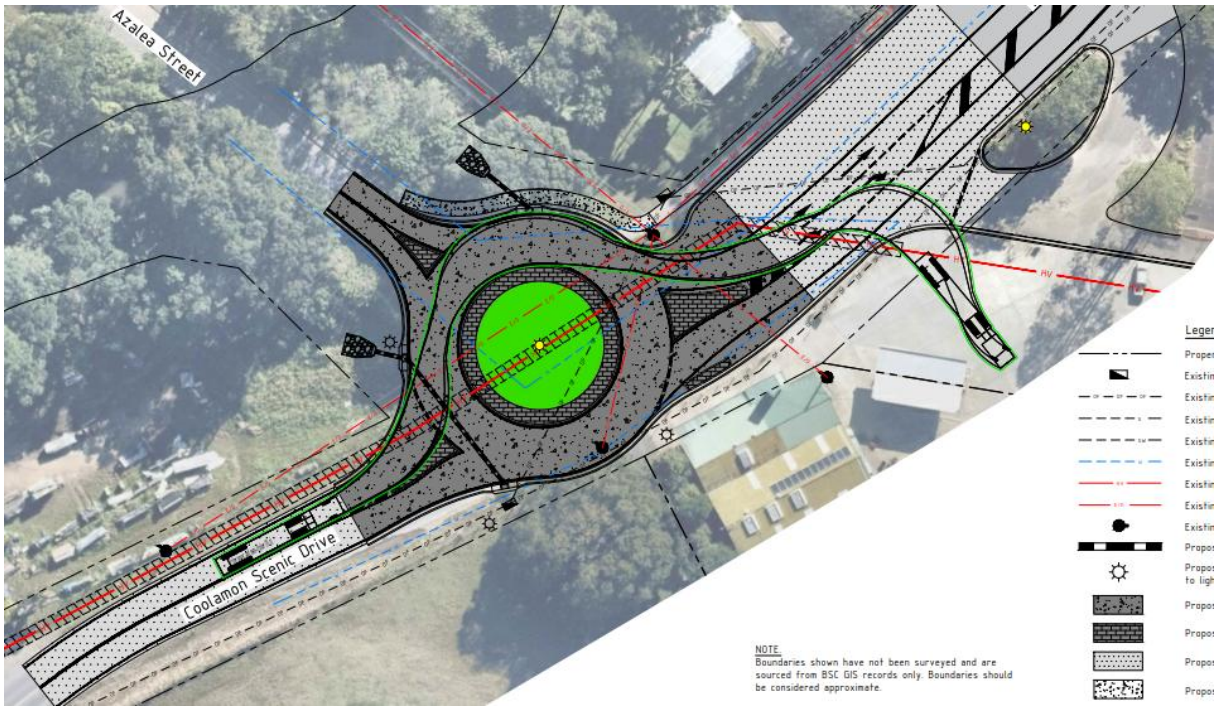

Figure 18: Coolamon Scenic Dr/Jubilee Ave/Azalea Street: Proposed Roundabout Upgrade.

SIDRA 9.0 Intersection modelling software has been utilised to develop and analyse and model the performance for the proposed upgrade for the present and a 10-year horizon time period between 2025 (Predicted year of operation) and 2035 (10-Year Horizon). The following key performance indicators were adopted when deciding whether a modelling scenario is a 'pass' or 'fail':

- Level of Service (LOS) on an intersection;
- Degree of Saturation (DOS); and
- Queuing Proportion.

SIDRA 9.0 Intersection Lane summaries outputs for each scenario are provided in Appendix A. The model setup is presented in Figure 19.

The following scenarios were modelled:

- Scenario 1: Time of Completion (2025), without the development impact (Figure 20);
- Scenario 2: Ultimate Planning Horizon (2035), without development impact (Figure 21);
- Scenario 3: Time of Completion (2025), including development impact (Figure 22); and
- Scenario 4: Ultimate planning Horizon (2035), including development impact (Figure 23).

Note that these include PM scenarios only, as these are considered more critical from a traffic generating point of view.

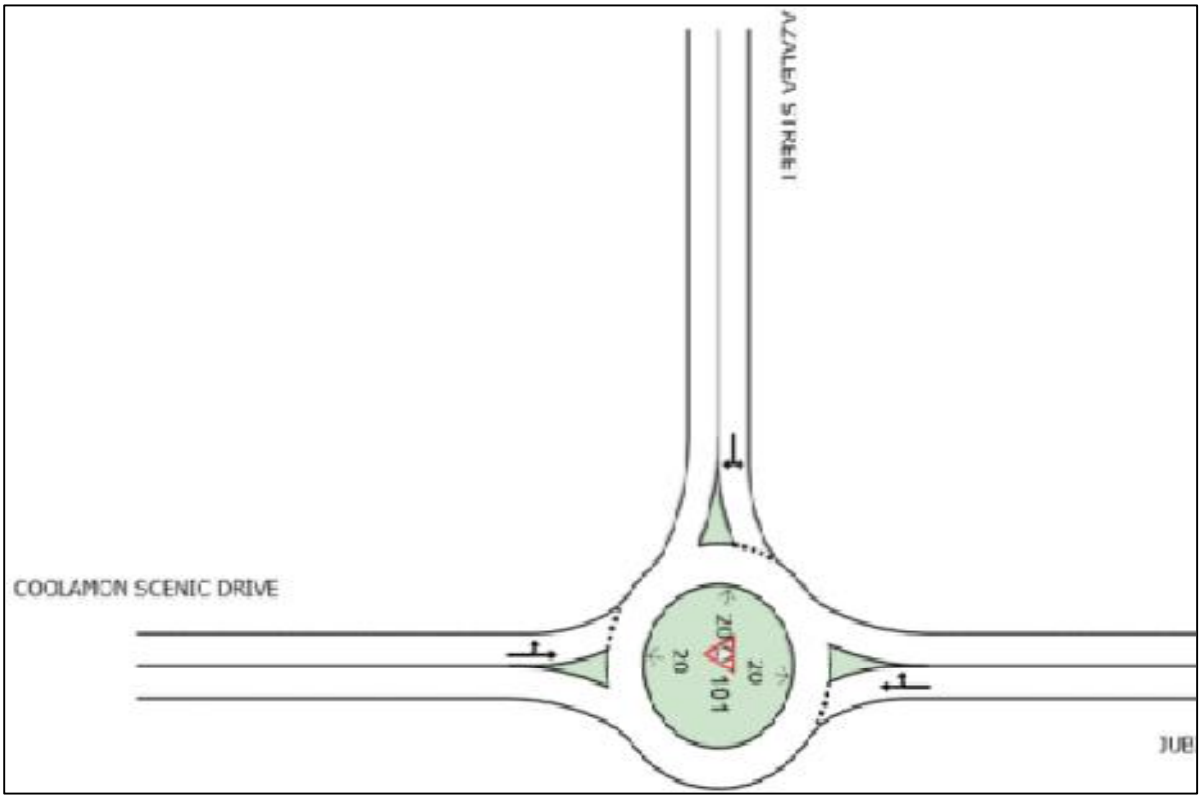

Figure 19: Coolamon Scenic Dr/Jubilee Ave/Azalea Street (Proposed Roundabout) SIDRA Setup

It should be noted that the model does not account for a delays that may be the result of congestion at the school crossing, including whether a roundabout configuration is likely to improve traffic flows. This should be subject to further investigation and modelling.

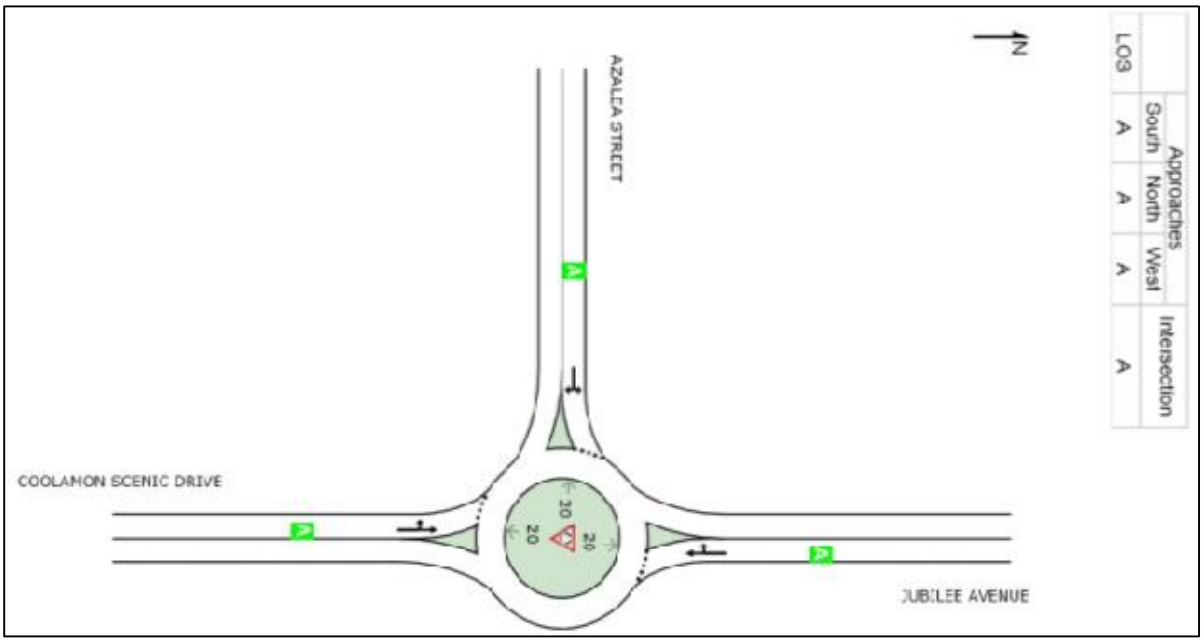

Figure 20: IC01 Results for Scenario 1 – 2025 Without Development Impact (PM Only)

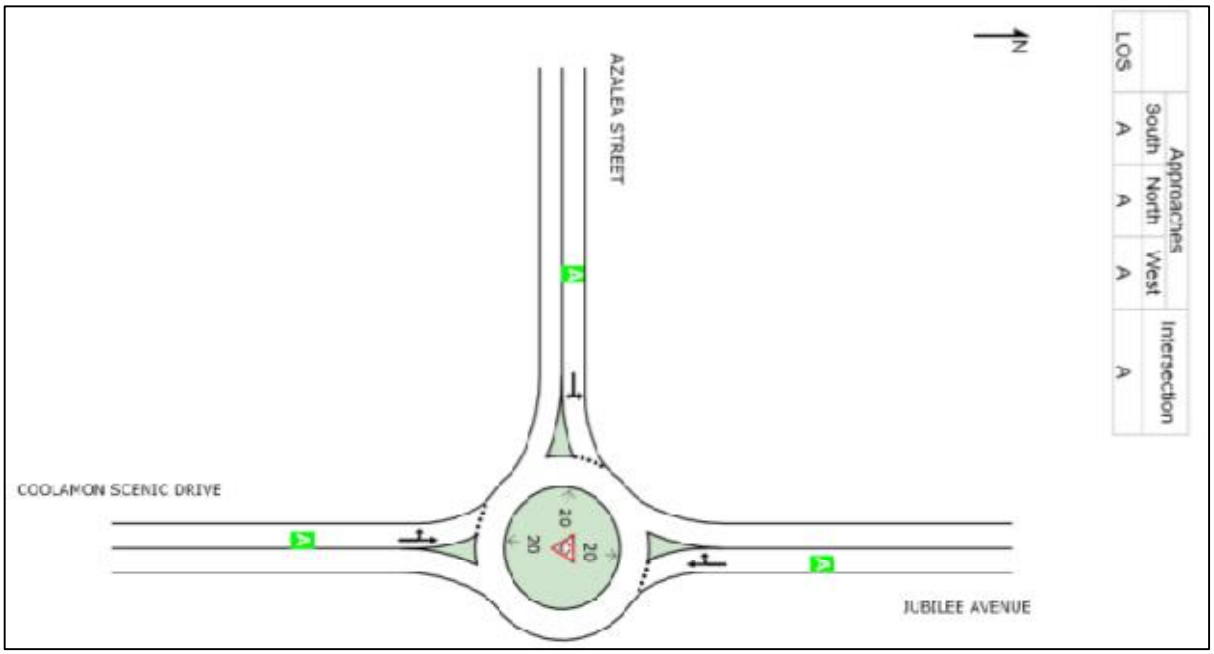

Figure 21: IC01 Results for Scenario 2 – 2035 Without Development Impact (PM Only)

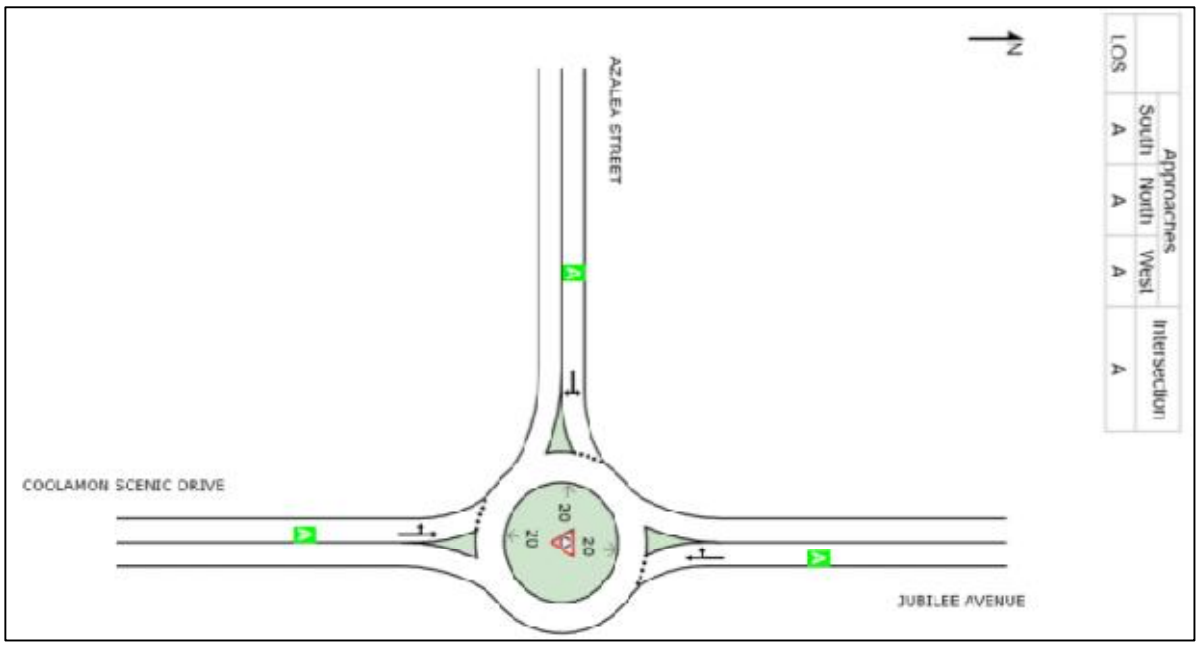

Figure 22: IC01 Results for Scenario 3 – 2025 With Development Impact (PM Only)

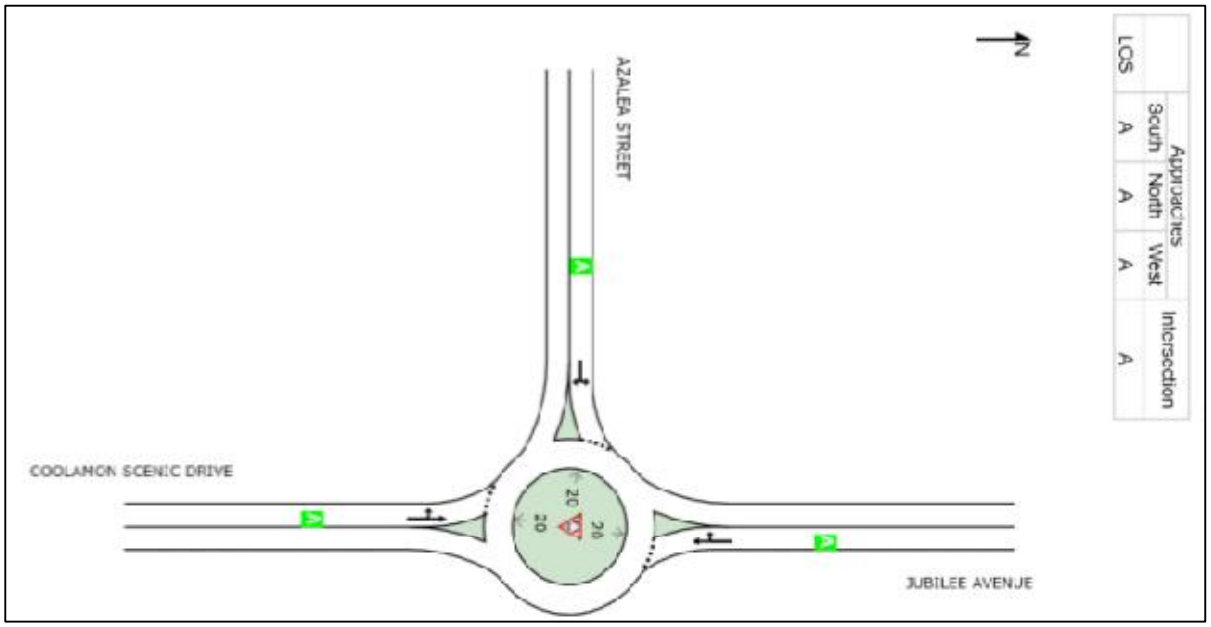

Figure 23: IC01 Results for Scenario 4 – 2035 With Development Impact (PM Only)

From the modelling results, it is evident that:

- The no-development scenarios achieve a LOS A for all roundabout approaches both in 2025 and 2035;
- A LOS A is maintained for all roundabout approaches in the developed scenario both in 2025 and 2035;
- The proposed upgrade provides an overall improvement over the existing intersection layout; and
- The proposed upgrade would not be required to achieve an acceptable LOS for the rezoning proposal in isolation but considering further development in the area (in addition to the subject site under investigation) would assist in future-proofing the road network

5 Road Safety Considerations

5.1 Crash History

Based on a search in the TfNSW crash data based, three (3) incidents have been identified within the study area over the five-year period between 2017 and 2021:

- Intersection between Azalea Street and coolamon Scenic Drive/ Jubilee Avenue:
  - 2017: right rear end, no serious injury or fatality.
- Intersection between Azalea Street and coolamon Scenic Drive/ Jubilee Avenue:
  - 2018: right through front on, no serious injury or fatality.
- Intersection between Azalea Street and Left Banks Road:
  - 2017: right turn side sweep, no serious injury or fatality.

Other than that all incidents occurred during daylight, there was no pattern found with these three accidents.

5.2 Efficiency of the Road Network

It is understood that there is some congestion within the road network at certain times. Figure 24 was extracted from google maps and represents 'typical traffic' at 3pm on a Weekday. Findings confirm that the road network within the study area currently operates at- or in excess of its design capacity.

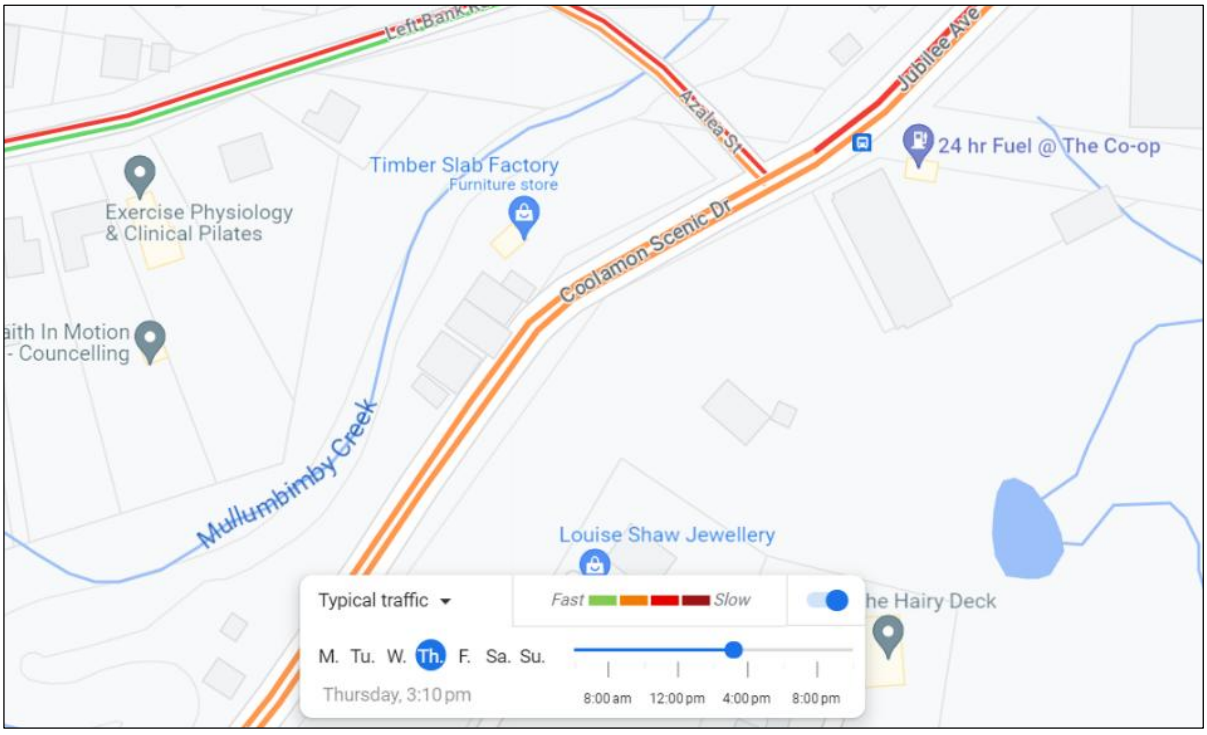

Figure 24: Traffic Congestion Example (Source, Google Maps, 2023)

Based on the findings in this preliminary assessment, no immediate safety concerns were identified providing that the road network can be adequately upgraded to cater for the increase in demand as a result of the rezoning proposal.

6 Internal Road Network

6.1 Road Hierarchy

It is anticipated that compared to typical subdivision standards, traffic within the future site will be relatively modest (approximate AADT of 600). Based on geometry and locality, the road network witin the site shall likely not function as a thoroughfare, and it is assumed that all traffic within the site is destination only. Accordingly, the internal road hierarchy will likely be:

- Central Road within the site:
  - Local Street with an 8m wide carriageway (potentially to be widened in curves to accommodate busses and HRV's such as waste trucks);
  - Footpath to be provided at least on one side of the road;
  - On-street parking to be provided as desired;
  - To be delineated via upright kerb; and
  - Minimum road reserve width approximately 12m (to be widened as needed).
- Remaining Roads (on-site parking desired):
  - Access Street/ laneway with 6m wide carriageway (potentially to be widened in curves to accommodate HRV's such as waste trucks);
  - Footpath to be provided at least on one side of the road;
  - On-street parking to be provided;
  - To be delineated via upright kerb; and
  - Minimum road reserve width approximately 10m (to be widened as needed).
- Remaining roads (on-site parking not desirable):
  - Roads to be a laid out as shared zones:
  - Access Street/ laneway with 6m wide carriageway (potentially to be widened in curves to accommodate HRV's such as waste trucks);
  - No separate footpath to be provided;
  - No on-street parking to be provided; and
  - Minimum road reserve width approximately 8m (to be widened as needed).

6.2 Local Area Traffic Management

Due to the proposed future form of the site, a low-speed environment is desirable. Appropriate speed limits will likely be:

- 30km/h-40km/h for the majority of roads; and
- 10km/h for roads dedicated as shared zones.

Accordingly, it is advised that principles of Local Area Traffic management (LATM) are to be implemented during design of the proposed schemed. These would likely include:

- Signage and pavement markings;
- Dedicated pedestrian crossings and traffic calming devices;
- Pavement treatments for shared zones;
- Lane narrowing; and/ or
- Landscaping treatments.

Local area traffic management should be implemented in accordance with Austroads standards and will require the preparation of a Local Area Traffic Management Plan (LATMP) as part of design.

6.3 Site Access

The factors to be considered when determining vehicular access include:

- Statutory requirements including Austroads, NRLG and Australian (AS2890) standards. Access points will likely need to be designed to intersection (NRLG and Austroads) standards;
- Topography, vegetation and other factors potentially obstructing sight distances;
- Surrounding uses;
- Proximity to existing driveways and intersections;
- Existing traffic on the roads fronting the intersection;
- Capacity of intersections and specific intersection legs directly adjacent to the driveway location;
- Ease of access for (larger) design vehicles; and
- Vehicular circulation within the site.

Potential locations for vehicular access are shown below in Figure 25. A preliminary analysis of opportunities and constraints is presented in Table 7.

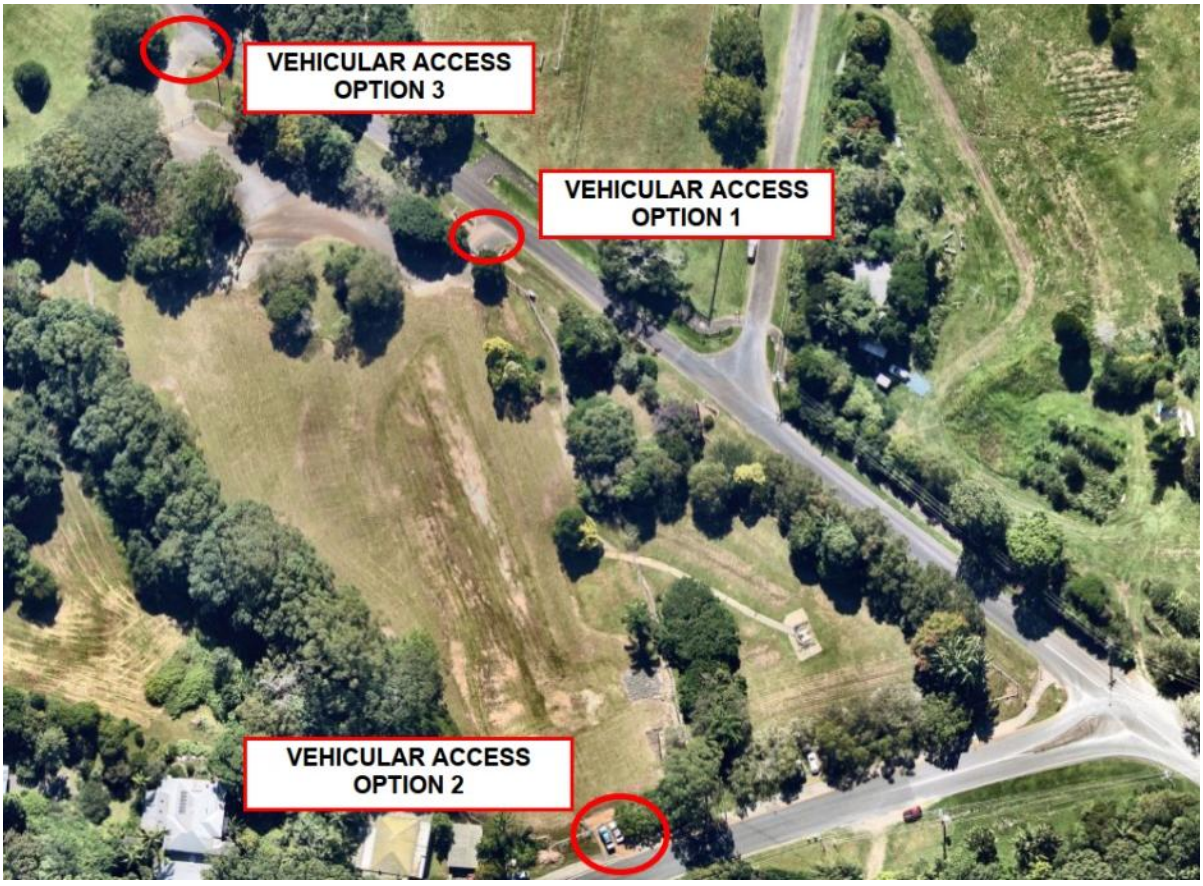

Figure 25: Potential Vehicular Access Locations

Table 7: Access Point Options Assessment

Access Option	Overview	Opportunities	Constraints
Option 1	Via Azalea Street towards the west of the site (location of existing crossover and former primary access to the Mullumbimby Hospital).	· Situated at the location of an existing crossover. · Spare capacity available on fronting road; and · Reasonable sight distances.	· Narrow road fronting the site may not accommodate turning movements of larger vehicles; and · Widening of the existing crossover may require extensive augmentation of existing infrastructure.

Access Option	Overview	Opportunities	Constraints
Option 2	Via Left Bank Road towards the south of the site (location of existing crossover and former primary access to the Mullumbimby Hospital).	· Will likely accommodate turning movements of larger vehicles; · Situated at the location of an existing crossover. · In combination with Option 1 or 3 will allow for good internal circulation via an internal arterial road. · Reasonable sight distances.	· No spare capacity available on fronting road; and
Option 3	Via Azalea Street towards the north of the site (location of existing crossover and former primary access to the Mullumbimby Hospital).	· Spare capacity available on fronting road; and · In combination with Option 2 will allow for good internal circulation via an internal arterial road.	· Sharp turn of existing crossover and narrow road fronting the site may not accommodate turning movements of larger vehicles; and · Reshaping of the existing crossover may require extensive augmentation of existing infrastructure; · Sub-optimal sight distances.

7 Parking

7.1 Parking Demand

Internal parking demand associated with the proposal was estimated using the Byron Shire Council DCP. The results are presented in Table 8.

Table 8: Parking Supply for The Proposed Development

Component	Rate	Development	Demand
Affordable Housing	0.5 x spaces per unit	20 x units	10 x spaces
Low Density Dwelling	2 x spaces per dwelling	80 x units	160 x spaces
Visitor Parking	0.25 spaces per occupancy	100 x occupancies	25 x spaces
Total Demand			195 x spaces

7.2 Parking Supply

It is proposed that the total parking demand is met as per Table 9.

Table 9: Parking Supply for The Proposed Development

Component	Options for Supply	Supply
Affordable Housing	Designated resident-only parking areas.	10x spaces
Low Density Dwelling	Private garages attached to each occupancy.	160x spacing
Visitor Parking	Internal on-street parking throughout the site and designated visitor parking areas.	25x spaces
Total Supply		195 spaces

7.3 Impact Assessment

Based on this parking assessment, it is anticipated that parking needs can be adequately catered for within the development footprint. It is further noted that:

- As per the provisions of the Affordable Housing SEPP, it is assumed that the affordable housing component constitutes a reduced demand for car parking compared to the remainder of the occupancies:
  - This is due to a reduced usage of personal vehicles by occupants of affordable housing and an increase usage of alternative means for transportation; and
  - Accordingly, to achieve a reduction in demand for car parking, connectivity by means of public transport is required. Refer to chapter 8 of this report for an outline of the proposed public transport strategy.
- As per section 7.2 of this report, it is assumed that (part of) visitor parking demand is catered for using internal on-street parking:
  - Due to the desired density of the development, single occupancies within the future site will likely have minimal street frontage. Due to the frequency of private driveways required to service these occupancies, potential for on-street parking is minimal;
  - On street parking is limited to sections of the future site with larger lots containing multi-occupancies with centralised parking; and
  - As per previous sections of this report, it is proposed that sections of the development that are unsuitable for on-street parking are to be designated as shared zones.
- No issues foreseen with integrating the total number of car spaces required within the internal road network.

7.4 Accessible Parking Requirements

To meet the demand for accessible parking, the following would be required for the proposed development:

- 10x accessible parking spaces to meet the demand for 10 accessible/ adaptable units; and
- It is advised that at least two of the visitor parks are designated as accessible.

Requirements for accessible parking bays are outlined in AS2890.6 and include:

- Parking bay dimensions are to be identical to those of non-accessible parking bays
  - Parking bays are to be clearly marked as accessible;
  - A Clear (shared) zone is to be provided directly adjacent to accessible parking bay. This clear zone shall be located on the same level as the parking bay and shall be 2.4m wide as a minimum:
  - The clear zone to be delineated marked using line marking. In addition, a bollard is to be located 800mm into the clear zone at its centreline.
- The overhead clearance of a parking bay is to be 2,500mm as a minimum. The minimum overhead clearance within the manoeuvring path between the property boundary and the parking bay is to be 2,200mm. This includes clearances under garage doors and bulkheads); and
- Accessible surface and continuous accessible connectivity with the designated use.

8 Alternative Means of Transport

8.1 Objectives

The Byron Shire Council 'Strategic Policy Statement' (2019) lists the following objectives:

- reduce the need for and / or dependency on private motor vehicle trips;
- improve public transport;
- support community transport;
- increase the bike network and/ or use;
- improve pedestrian and residential amenity;
- support advocacy, partnerships and / or community involvement;
- improve road user safety;
- improve integration and regional connectivity; and
- support climate change adaptation and mitigation.

In keeping with these objectives, this section of the report details provisions for alternative modes of transport and a subsequent reduced reliance on car trips and car parking spaces at the future site.

8.2 Public Transport

The nearest bus stop to the proposed development is located at River Terrace approximately 1.1km to the northeast of the site. This is also the only us stop in Mullumbimby. The main public transport operator in the area is Blanch's. Its current schedule includes one (1) bus route servicing the abovementioned bus stop, which connects Mullumbimby with Ewingsdale, Byron Bay, Suffolk Park, Lennox Head and Ballina – including the Ballina Byron Gateway Airport (Figure 26).

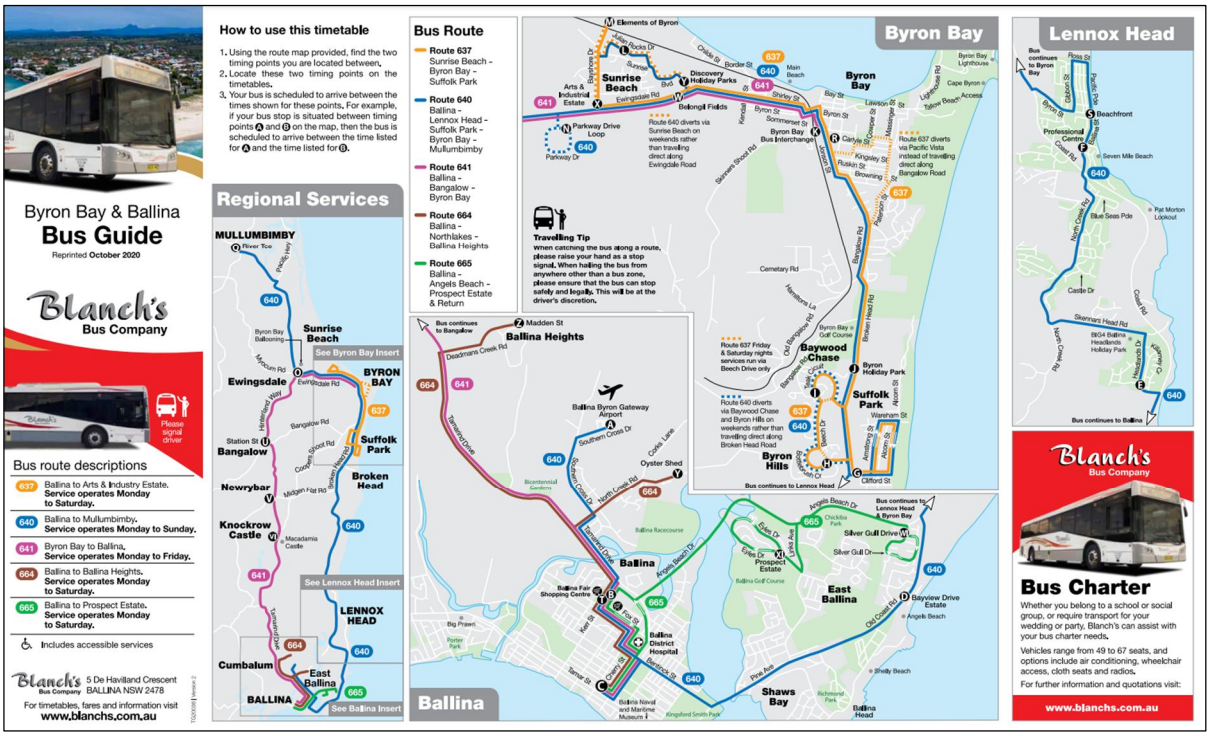

Figure 26: Current Bus Services (Adopted from Blanche's Bus Company, 2023)

The commute between the River Terrace Bus and the site is estimated to be a 14-minute walk or a 4-minute bicycle ride. Although suitable pedestrian and cycling facilities are currently present, this travel is considered unsuitable to satisfy the objectives of the affordable housing SEPP. To provide suitable and equitable affordable housing, a public transport strategy should be incorporated into future development. Itis advised that future development on the site requires the expansion of the current public transport network and the incorporation of a new bus stop.

- Planit is not aware of any direct plans from Blanche's (or other operators) to expand its services within Mullumbimby. Expansion of the public transport network should be planned in conjunction with a suitable operator;
- Constraints were identified with incorporating a bus stop into the existing road network within close proximity of the site:
  - The most logical route for a but to service the site would be for the bus to approach the site from Coolamon Scenic Drive onto Azalea Street.
    - It is assumed that after servicing the site, the bus shall return to the town centre via Jubilee Avenue.;
    - No suitable alternative routes were identified for busses to continue their routes towards the north via Azalea or west via Street or Left Bank Road.
    - Due to geometric constraints, Azalea Street or Left Bank Road are considered unsuitable for a bus to turn around. The only potential loop identified consists of:

      continue onto Azalea street to the north > turn right onto Coolamon Avenue > turn right onto Poplar Street > turn left onto Azalea Street towards Jubilee Avenue.

      This would require augmentation to Coolamon Avenue and Poplar Street.
  - Any alternative routes would add considerable travel time to the bus route without any perceived benefit.
- It is envisioned that a but stop shall be provided within the site:
  - As per Section 6.1 of the report, it is envisioned that the key road throughout the site shall be designed to the standards of a local street as a minimum.
    - Widths for a local street should be suitable to accommodate a bus if curve radii are kept relatively large, and if appropriate curve widening is provided;
    - This option would require a minimum of two suitable access points to the site. Ideally, these would include one access point onto Left Bank Road and one access point onto Azalea Street; and
    - Based on preliminary turning movement assessment by Planit, this option is considered feasible within the constraints of the site.

8.3 Alternative Modes of Transportation

The road network surrounding the site includes provisions for safe and convenient access for pedestrians and cyclists. Provisions that should be incorporated into future development include:

- A suitable internal pedestrian circulation network should be provided as part of any proposed development. Opportunities for shared zones to be incorporated into future development design were identified;
- Continuation of pedestrian and cyclist networks external of the site should be ensured. Based on preliminary assessment, is it assumed that suitable facilities are present to accommodate foot- and bicycle trips to the town centre, the adjacent high school as well as a variety of public sport and recreational facilities;
- Carpooling and rideshare provisions could be incorporated into future development design; and
- Suitable resident and visitor bicycle storage should be incorporated into development design.

The Byron Shire Bike Plan identifies the existing bike paths within Mullumbimby (Figure 27). As evident from the figure, a shared path is present for the majority of the route between the subject site and the town centre. The missing link within this cycling/ pedestrian network is the section of

Jubilee Street adjacent to the school. It is noted that, for this section, continuity of pedestrian access is present via footpath.

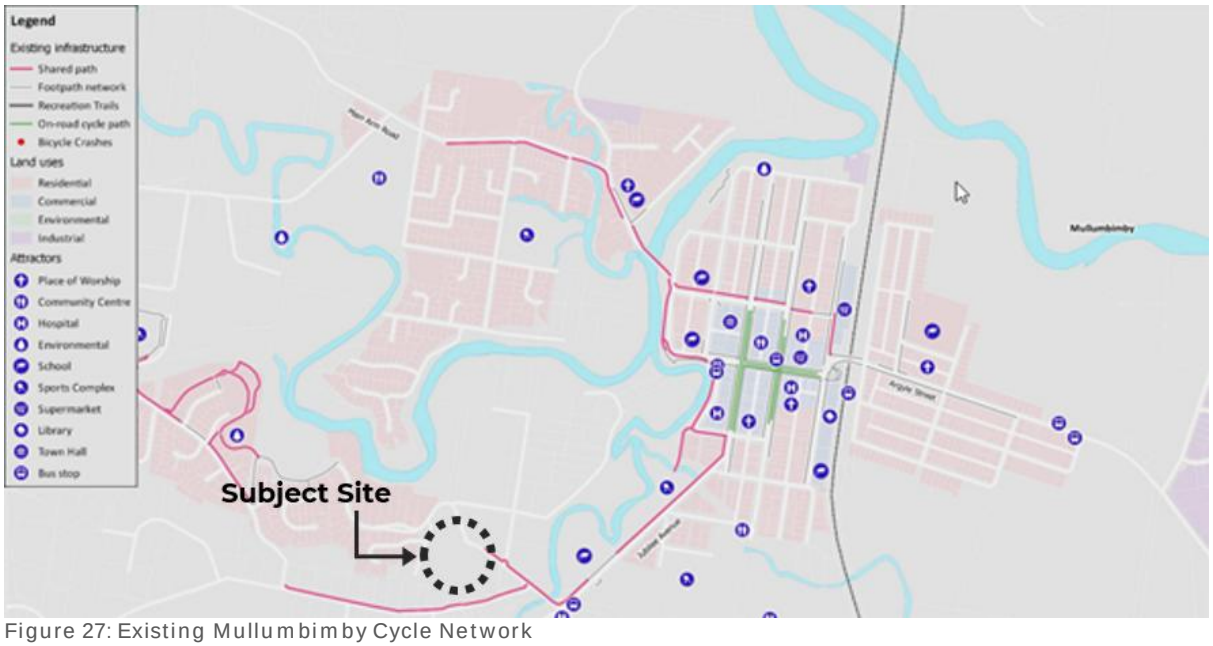

Figure 27: Existing Mullumbimby Cycle Network

The Byron Shire Bike Plan states that "Mullumbimby's current cycle network provides a good foundation for future expansion". The majority of the core commercial area in the town centre is currently serviced by a network of cycle paths. These paths, however, currently only provide partial connectivity to the existing shared cycle path network and they do not extend further north, south or east into surrounding residential areas.

The Plan identifies the provision of aforementioned missing link for future upgrades. In addition, proposals include a full upgrade of the shared path between the subject site and the town centre. This is illustrated in Figure 28. This upgrade is considered of key significance to service the subject site by providing connectivity between the town centre and the site.

Figure 28: Proposed Cycle Path Upgrades

9 Conclusions and Recommendations

This Transport Strategy (TS) has been prepared to inform Byron Shire Council's assessment into rezoning the former hospital site at 1-3 Azalea St, Mullumbimby NSW. Under this proposal, the site is to be rezoned from SP2 infrastructure to R1 Residential, potentially yielding 130 occupancies. It was found that:

- The proposal would constitute a 'moderate' to 'high' impact with an increase in car trips of 46-63 trips/h and 32-66 trips/h during the AM and PM peak respectively;
- Currently, roads in the vicinity of the site operate at the upper end of their capacities.
  - The key intersections within the vicinity of the site have adequate capacity to accommodate the rezoning proposal;
  - Upgrading the Scenic Drive/ Jubilee Avenue/ Azalea Street intersection to a roundabout would result in a small improvements in traffic flow.
- No significant history of adverse safety was identified within the road network within the direct vicinity of the site. However, regular congestion seems to occur.
  - It is hypothesised that the root cause of this congestion is the school zone located north of the Scenic Drive/ Jubilee Avenue/ Azalea Street intersection. Further investigation into the cause and potential solution is required.
- It is anticipated that compared to typical subdivision standards, traffic within the future site will be relatively modest The internal road hierarchy will likely be:
  - 1x Central Road within the site to 'local street' standards;
  - Remaining roads within the site to be to 'access street' 'laneway' standards:
  - Where suitable, roads to be laid out as shared zones; and
  - The design of the future road hierarchy should be supported by a Local Area Traffic management (LATM) plan.
- It is anticipated that a minimum of 2x access points are required to service the site, including at least one access point onto Left Bank Road.
- It is envisioned that parking demand shall be met through a combination of designated resident-only parking areas, private garages attached to occupancies and visitor parking via internal on-street parking throughout the site and designated visitor parking areas.
- To adequately support the affordable housing component of the proposal, a public transport strategy is required. It is proposed that a bus stop is incorporated into the future design of the site; and
- Further provisions for alternative means of transport to be incorporated into future design include:
  - A suitable internal pedestrian circulation network;
  - Continuation of pedestrian and cyclist networks external of the site;
  - Carpooling/ rideshare provisions; and
  - Suitable resident bicycle storage.
- Implementation upgrades within Mullumbimby as identified and proposed in the Byron Shire Bike Plan are recommended to provide suitable connectivity between the subject site and the town centre.

Based on Planit's assessment, it was determined that the rezoning proposal would not result in significant adverse effects on traffic flows within the vicinity of the site and that impacts can be adequately mitigated.

Appendix A – SIDRA Outputs

LANE SUMMARY

▽ Site: 101 [2022 - AM BASE PEAK DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Base Model - AM Peak Base)]

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

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	237	2.0	1094	0.217	100	5.4	LOS A	0.8	5.8	Full	250	0.0	0.0
Approach	237	2.0		0.217		5.4	LOS A	0.8	5.8				
East: AZALEA STREET													
Lane 1	226	2.0	1913	0.118	100	4.6	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	226	2.0		0.118		4.6	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	51	2.0	1926	0.026	100	0.6	LOS A	0.0	0.2	Full	250	0.0	0.0
Approach	51	2.0		0.026		0.6	NA	0.0	0.2				
Intersection	514	2.0		0.217		4.6	NA	0.8	5.8				

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

LANE SUMMARY

▽ Site: 101 [2032 - AM BASE PEAK DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Base Model - AM Peak Base)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	303	2.0	1094	0.277	100	5.4	LOS A	1.1	7.8	Full	250	0.0	0.0
Approach	303	2.0		0.277		5.4	LOS A	1.1	7.8				
East: AZALEA STREET													
Lane 1	226	2.0	1913	0.118	100	4.6	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	226	2.0		0.118		4.6	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	51	2.0	1926	0.026	100	0.6	LOS A	0.0	0.2	Full	250	0.0	0.0
Approach	51	2.0		0.026		0.6	NA	0.0	0.2				
Intersection	580	2.0		0.277		4.7	NA	1.1	7.8				

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

LANE SUMMARY

▽ Site: 101 [2025 - AM BASE PEAK DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Base Model - AM Peak Base)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 3 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	255	2.0	1080	0.236	100	5.5	LOS A	0.9	6.4	Full	250	0.0	0.0
Approach	255	2.0		0.236		5.5	LOS A	0.9	6.4				
East: AZALEA STREET													
Lane 1	244	2.0	1913	0.127	100	4.6	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	244	2.0		0.127		4.6	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	54	2.0	1923	0.028	100	0.6	LOS A	0.0	0.2	Full	250	0.0	0.0
Approach	54	2.0		0.028		0.6	NA	0.0	0.2				
Intersection	553	2.0		0.236		4.6	NA	0.9	6.4				

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

LANE SUMMARY

▽ Site: 101 [2035 - AM BASE PEAK DATA AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Base Model - AM Peak Base)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 13 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	326	2.0	1025	0.318	100	5.9	LOS A	1.3	9.2	Full	250	0.0	0.0
Approach	326	2.0		0.318		5.9	LOS A	1.3	9.2				
East: AZALEA STREET													
Lane 1	312	2.0	1913	0.163	100	4.6	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	312	2.0		0.163		4.6	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	70	2.0	1907	0.037	100	0.7	LOS A	0.0	0.3	Full	250	0.0	0.0
Approach	70	2.0		0.037		0.7	NA	0.0	0.3				
Intersection	708	2.0		0.318		4.8	NA	1.3	9.2				

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

LANE SUMMARY

▽ Site: 101 [2025 - AM POST DEV PEAK DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Future Model - AM Peak Base)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 3 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	291	2.0	1060	0.275	100	5.6	LOS A	1.1	7.7	Full	250	0.0	0.0
Approach	291	2.0		0.275		5.6	LOS A	1.1	7.7				
East: AZALEA STREET													
Lane 1	226	2.0	1913	0.118	100	4.6	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	226	2.0		0.118		4.6	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	84	2.0	1953	0.043	100	0.4	LOS A	0.0	0.2	Full	250	0.0	0.0
Approach	84	2.0		0.043		0.4	NA	0.0	0.2				
Intersection	602	2.0		0.275		4.5	NA	1.1	7.7				

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

LANE SUMMARY

▽ Site: 101 [2035 - AM POST DEV PEAK DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Future Model - AM Peak Base)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 13 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	373	2.0	1060	0.352	100	5.7	LOS A	1.5	10.6	Full	250	0.0	0.0
Approach	373	2.0		0.352		5.7	LOS A	1.5	10.6				
East: AZALEA STREET													
Lane 1	226	2.0	1913	0.118	100	4.6	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	226	2.0		0.118		4.6	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	84	2.0	1953	0.043	100	0.4	LOS A	0.0	0.2	Full	250	0.0	0.0
Approach	84	2.0		0.043		0.4	NA	0.0	0.2				
Intersection	683	2.0		0.352		4.7	NA	1.5	10.6				

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

LANE SUMMARY

▽ Site: 101 [2025 - PM BASE DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Base Model - PM Peak 01)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 3 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	205	2.0	1066	0.193	100	5.5	LOS A	0.7	5.0	Full	250	0.0	0.0
Approach	205	2.0		0.193		5.5	LOS A	0.7	5.0				
East: AZALEA STREET													
Lane 1	263	2.0	1915	0.137	100	4.5	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	263	2.0		0.137		4.5	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	65	2.0	1921	0.034	100	0.6	LOS A	0.0	0.3	Full	250	0.0	0.0
Approach	65	2.0		0.034		0.6	NA	0.0	0.3				
Intersection	533	2.0		0.193		4.4	NA	0.7	5.0				

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

LANE SUMMARY

▽ Site: 101 [2035 - PM BASE PEAK DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Base Model - PM Peak 01)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 13 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	263	2.0	1022	0.257	100	5.8	LOS A	1.0	7.0	Full	250	0.0	0.0
Approach	263	2.0		0.257		5.8	LOS A	1.0	7.0				
East: AZALEA STREET													
Lane 1	337	2.0	1915	0.176	100	4.5	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	337	2.0		0.176		4.5	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	65	2.0	1903	0.034	100	0.7	LOS A	0.0	0.3	Full	250	0.0	0.0
Approach	65	2.0		0.034		0.7	NA	0.0	0.3				
Intersection	665	2.0		0.257		4.6	NA	1.0	7.0				

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

LANE SUMMARY

▽ Site: 101 [2025 - PM BASE PEAK DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Future Model - PM Peak 01 - Copy)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 3 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	243	2.0	1031	0.235	100	5.7	LOS A	0.9	6.3	Full	250	0.0	0.0
Approach	243	2.0		0.235		5.7	LOS A	0.9	6.3				
East: AZALEA STREET													
Lane 1	263	2.0	1915	0.137	100	4.5	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	263	2.0		0.137		4.5	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	99	2.0	1955	0.051	100	0.3	LOS A	0.0	0.2	Full	250	0.0	0.0
Approach	99	2.0		0.051		0.3	NA	0.0	0.2				
Intersection	605	2.0		0.235		4.3	NA	0.9	6.3				

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

LANE SUMMARY

▽ Site: 101 [2035 - PM BASE PEAK DATA- AZALEA ST/LEFT BANK ROAD (Site Folder: Azalea St/Left Bank Future Model - PM Peak 01 - Copy)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: LEFT BANK ROAD													
Lane 1	288	2.0	1002	0.288	100	6.0	LOS A	1.1	8.1	Full	250	0.0	0.0
Approach	288	2.0		0.288		6.0	LOS A	1.1	8.1				
East: AZALEA STREET													
Lane 1	313	2.0	1915	0.163	100	4.5	LOS A	0.0	0.0	Full	100	0.0	0.0
Approach	313	2.0		0.163		4.5	NA	0.0	0.0				
West: AZALEA STREET													
Lane 1	99	2.0	1949	0.051	100	0.4	LOS A	0.0	0.3	Full	250	0.0	0.0
Approach	99	2.0		0.051		0.4	NA	0.0	0.3				
Intersection	700	2.0		0.288		4.5	NA	1.1	8.1				

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

LANE SUMMARY

▽ Site: 101 [2022 - AM Base PEAK DATA -Coolamon Scenic Rd/Azalea St/Jubilee Ave (Site Folder: Coolamon Scenic Road - Future AM Peak)]

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

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DR													
Lane 1	324	3.0	1918	0.169	100	1.8	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	324	3.0		0.169		1.8	NA	0.0	0.0				
North: JUBILEE AVE													
Lane 1	179	3.0	1922	0.093	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	179	3.0	1293	0.138	100	4.7	LOS A	0.6	4.6	Short	80	0.0	NA
Approach	358	3.0		0.138		2.3	NA	0.6	4.6				
West: AZALEA STREET													
Lane 1	224	3.0	1247	0.180	100	5.7	LOS A	0.8	5.5	Short	25	0.0	NA
Lane 2	52	3.0	516	0.100	100	9.9	LOS A	0.4	2.6	Full	100	0.0	0.0
Approach	276	3.0		0.180		6.5	LOS A	0.8	5.5				
Intersection	958	3.0		0.180		3.3	NA	0.8	5.5				

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

LANE SUMMARY

▽ Site: 101 [2032 - AM Base PEAK DATA -Coolamon Scenic Rd/Azalea St/Jubilee Ave (Site Folder: Coolamon Scenic Road - Future AM Peak)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DR													
Lane 1	415	3.0	1918	0.216	100	1.8	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	415	3.0		0.216		1.8	NA	0.0	0.0				
North: JUBILEE AVE													
Lane 1	229	3.0	1919	0.119	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	229	3.0	1164	0.197	100	5.2	LOS A	0.9	6.5	Short	80	0.0	NA
Approach	458	3.0		0.197		2.6	NA	0.9	6.5				
West: AZALEA STREET													
Lane 1	287	3.0	1148	0.250	100	6.2	LOS A	1.1	7.9	Short	25	0.0	NA
Lane 2	66	3.0	391	0.169	100	12.9	LOS B	0.6	4.4	Full	100	0.0	0.0
Approach	353	3.0		0.250		7.4	LOS A	1.1	7.9				
Intersection	1226	3.0		0.250		3.7	NA	1.1	7.9				

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

LANE SUMMARY

▽ Site: 101 [2025 - AM Base PEAK DATA -Coolamon Scenic Rd/Azalea St/Jubilee Ave (Site Folder: Coolamon Scenic Road - Future AM Peak)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 3 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DR													
Lane 1	349	3.0	1918	0.182	100	1.8	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	349	3.0		0.182		1.8	NA	0.0	0.0				
North: JUBILEE AVE													
Lane 1	192	3.0	1921	0.100	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	192	3.0	1258	0.153	100	4.8	LOS A	0.7	5.0	Short	80	0.0	NA
Approach	385	3.0		0.153		2.4	NA	0.7	5.0				
West: AZALEA STREET													
Lane 1	241	3.0	1221	0.197	100	5.8	LOS A	0.9	6.1	Short	25	0.0	NA
Lane 2	55	3.0	480	0.115	100	10.6	LOS B	0.4	3.0	Full	100	0.0	0.0
Approach	296	3.0		0.197		6.7	LOS A	0.9	6.1				
Intersection	1030	3.0		0.197		3.4	NA	0.9	6.1				

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

LANE SUMMARY

▽ Site: 101 [2035 - AM Base PEAK DATA -Coolamon Scenic Rd/Azalea St/Jubilee Ave (Site Folder: Coolamon Scenic Road - Future AM Peak)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 13 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DR													
Lane 1	447	3.0	1918	0.233	100	1.8	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	447	3.0		0.233		1.8	NA	0.0	0.0				
North: JUBILEE AVE													
Lane 1	247	3.0	1918	0.129	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	247	3.0	1120	0.220	100	5.5	LOS A	1.0	7.3	Short	80	0.0	NA
Approach	493	3.0		0.220		2.7	NA	1.0	7.3				
West: AZALEA STREET													
Lane 1	309	3.0	1113	0.278	100	6.4	LOS A	1.2	8.9	Short	25	0.0	NA
Lane 2	71	3.0	353	0.201	100	14.4	LOS B	0.7	5.3	Full	100	0.0	0.0
Approach	380	3.0		0.278		7.9	LOS A	1.2	8.9				
Intersection	1320	3.0		0.278		3.9	NA	1.2	8.9				

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

LANE SUMMARY

▽ Site: 101 [2025 - PM BASE PEAK DATA -Coolamon Scenic Rd/Azalea St/Jubilee Ave (Site Folder: Coolamon Scenic Road - BASE - PM Peak)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 3 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DR													
Lane 1	347	3.0	1919	0.181	100	1.7	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	347	3.0		0.181		1.7	NA	0.0	0.0				
North: JUBILEE AVE													
Lane 1	325	3.0	1915	0.170	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	199	3.0	1260	0.158	100	4.8	LOS A	0.7	5.2	Short	80	0.0	NA
Approach	524	3.0		0.170		1.9	NA	0.7	5.2				
West: AZALEA STREET													
Lane 1	215	3.0	1218	0.177	100	5.8	LOS A	0.8	5.4	Short	25	0.0	NA
Lane 2	40	3.0	393	0.101	100	12.5	LOS B	0.4	2.6	Full	100	0.0	0.0
Approach	255	3.0		0.177		6.8	LOS A	0.8	5.4				
Intersection	1126	3.0		0.181		2.9	NA	0.8	5.4				

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

LANE SUMMARY

▽ Site: 101 [2035- PM BASE PEAK DATA -Coolamon Scenic Rd/Azalea St/Jubilee Ave (Site Folder: Coolamon Scenic Road - BASE - PM Peak)]

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 13 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DR													
Lane 1	445	3.0	1919	0.232	100	1.8	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	445	3.0		0.232		1.8	NA	0.0	0.0				
North: JUBILEE AVE													
Lane 1	416	3.0	1921	0.217	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	255	3.0	1122	0.228	100	5.5	LOS A	1.1	7.6	Short	80	0.0	NA
Approach	672	3.0		0.228		2.1	NA	1.1	7.6				
West: AZALEA STREET													
Lane 1	276	3.0	1110	0.248	100	6.3	LOS A	1.1	7.8	Short	25	0.0	NA
Lane 2	51	3.0	267	0.190	100	18.1	LOS C	0.7	4.7	Full	100	0.0	0.0
Approach	326	3.0		0.248		8.2	LOS A	1.1	7.8				
Intersection	1444	3.0		0.248		3.4	NA	1.1	7.8				

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

LANE SUMMARY

▽ Site: 101 [2025 - PM POST PEAK DATA -Coolamon Scenic Rd/Azalea St/Jubilee Ave (Site Folder: Coolamon Scenic Road - BASE - PM Peak)]

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

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DR													
Lane 1	365	3.0	1915	0.191	100	1.9	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	365	3.0		0.191		1.9	NA	0.0	0.0				
North: JUBILEE AVE													
Lane 1	325	3.0	1923	0.169	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	218	3.0	1234	0.177	100	4.9	LOS A	0.8	5.9	Short	80	0.0	NA
Approach	543	3.0		0.177		2.0	NA	0.8	5.9				
West: AZALEA STREET													
Lane 1	234	3.0	1218	0.192	100	5.8	LOS A	0.8	5.9	Short	25	0.0	NA
Lane 2	58	3.0	377	0.154	100	13.2	LOS B	0.5	3.9	Full	100	0.0	0.0
Approach	292	3.0		0.192		7.3	LOS A	0.8	5.9				
Intersection	1200	3.0		0.192		3.3	NA	0.8	5.9				

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

LANE SUMMARY

▽ Site: 101 [2035 - PM POST PEAK DATA -Coolamon Scenic Rd/Azalea St/Jubilee Ave (Site Folder: Coolamon Scenic Road - BASE - PM Peak)]

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

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DR													
Lane 1	463	3.0	1916	0.242	100	1.9	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	463	3.0		0.242		1.9	NA	0.0	0.0				
North: JUBILEE AVE													
Lane 1	417	3.0	1920	0.217	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	274	3.0	1097	0.249	100	5.6	LOS A	1.2	8.4	Short	80	0.0	NA
Approach	691	3.0		0.249		2.3	NA	1.2	8.4				
West: AZALEA STREET													
Lane 1	294	3.0	1110	0.265	100	6.4	LOS A	1.2	8.4	Short	25	0.0	NA
Lane 2	68	3.0	256	0.267	100	20.1	LOS C	1.0	7.1	Full	100	0.0	0.0
Approach	362	3.0		0.267		9.0	LOS A	1.2	8.4				
Intersection	1516	3.0		0.267		3.7	NA	1.2	8.4				

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

LANE SUMMARY

Site: 101 [2025- PM Base Roundabout Model (Site Folder: Concept Model)]

New Site
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 3 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DRIVE													
Lane 1[d]	347	3.0	1168	0.297	100	4.0	LOS A	1.8	13.0	Full	500	0.0	0.0
Approach	347	3.0		0.297		4.0	LOS A	1.8	13.0				
North: JUBILEE AVENUE													
Lane 1[d]	524	3.0	1492	0.351	100	3.0	LOS A	2.6	18.8	Full	500	0.0	0.0
Approach	524	3.0		0.351		3.0	LOS A	2.6	18.8				
West: AZALEA STREET													
Lane 1[d]	255	3.0	1042	0.244	100	5.3	LOS A	1.5	10.6	Full	100	0.0	0.0
Approach	255	3.0		0.244		5.3	LOS A	1.5	10.6				
Intersection	1126	3.0		0.351		3.8	LOS A	2.6	18.8				

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

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2035- PM Base Roundabout Model (Site Folder: Concept Model)]

New Site
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 13 years

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DRIVE													
Lane 1[d]	445	3.0	1110	0.401	100	4.5	LOS A	2.7	19.4	Full	500	0.0	0.0
Approach	445	3.0		0.401		4.5	LOS A	2.7	19.4				
North: JUBILEE AVENUE													
Lane 1[d]	672	3.0	1472	0.457	100	3.2	LOS A	4.0	28.8	Full	500	0.0	0.0
Approach	672	3.0		0.457		3.2	LOS A	4.0	28.8				
West: AZALEA STREET													
Lane 1[d]	326	3.0	958	0.341	100	6.0	LOS A	2.3	16.2	Full	100	0.0	0.0
Approach	326	3.0		0.341		6.0	LOS A	2.3	16.2				
Intersection	1444	3.0		0.457		4.2	LOS A	4.0	28.8				

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

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2025- PM Future Roundabout Model (Site Folder: Concept Model)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DRIVE													
Lane 1[d]	365	3.0	1145	0.319	100	4.1	LOS A	2.0	14.3	Full	500	0.0	0.0
Approach	365	3.0		0.319		4.1	LOS A	2.0	14.3				
North: JUBILEE AVENUE													
Lane 1[d]	543	3.0	1438	0.378	100	3.3	LOS A	2.9	20.7	Full	500	0.0	0.0
Approach	543	3.0		0.378		3.3	LOS A	2.9	20.7				
West: AZALEA STREET													
Lane 1[d]	292	3.0	1040	0.280	100	5.6	LOS A	1.8	12.6	Full	100	0.0	0.0
Approach	292	3.0		0.280		5.6	LOS A	1.8	12.6				
Intersection	1200	3.0		0.378		4.1	LOS A	2.9	20.7				

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

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2035- PM Future Roundabout Model - (Site Folder: Concept Model)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: COOLAMON SCENIC DRIVE													
Lane 1[d]	463	3.0	1087	0.426	100	4.7	LOS A	3.0	21.3	Full	500	0.0	0.0
Approach	463	3.0		0.426		4.7	LOS A	3.0	21.3				
North: JUBILEE AVENUE													
Lane 1[d]	691	3.0	1424	0.485	100	3.4	LOS A	4.4	31.5	Full	500	0.0	0.0
Approach	691	3.0		0.485		3.4	LOS A	4.4	31.5				
West: AZALEA STREET													
Lane 1[d]	362	3.0	955	0.379	100	6.3	LOS A	2.6	18.7	Full	100	0.0	0.0
Approach	362	3.0		0.379		6.3	LOS A	2.6	18.7				
Intersection	1516	3.0		0.485		4.5	LOS A	4.4	31.5				

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

d Dominant lane on roundabout approach