

TRAFFIC ASSESSMENT REPORT

PLANNING PROPOSAL

R1 RESIDENTIAL REZONING

FOR

RESIDENTIAL SUBDIVISION

KOLODONG ROAD

TAREE

14 DECEMBER 2018

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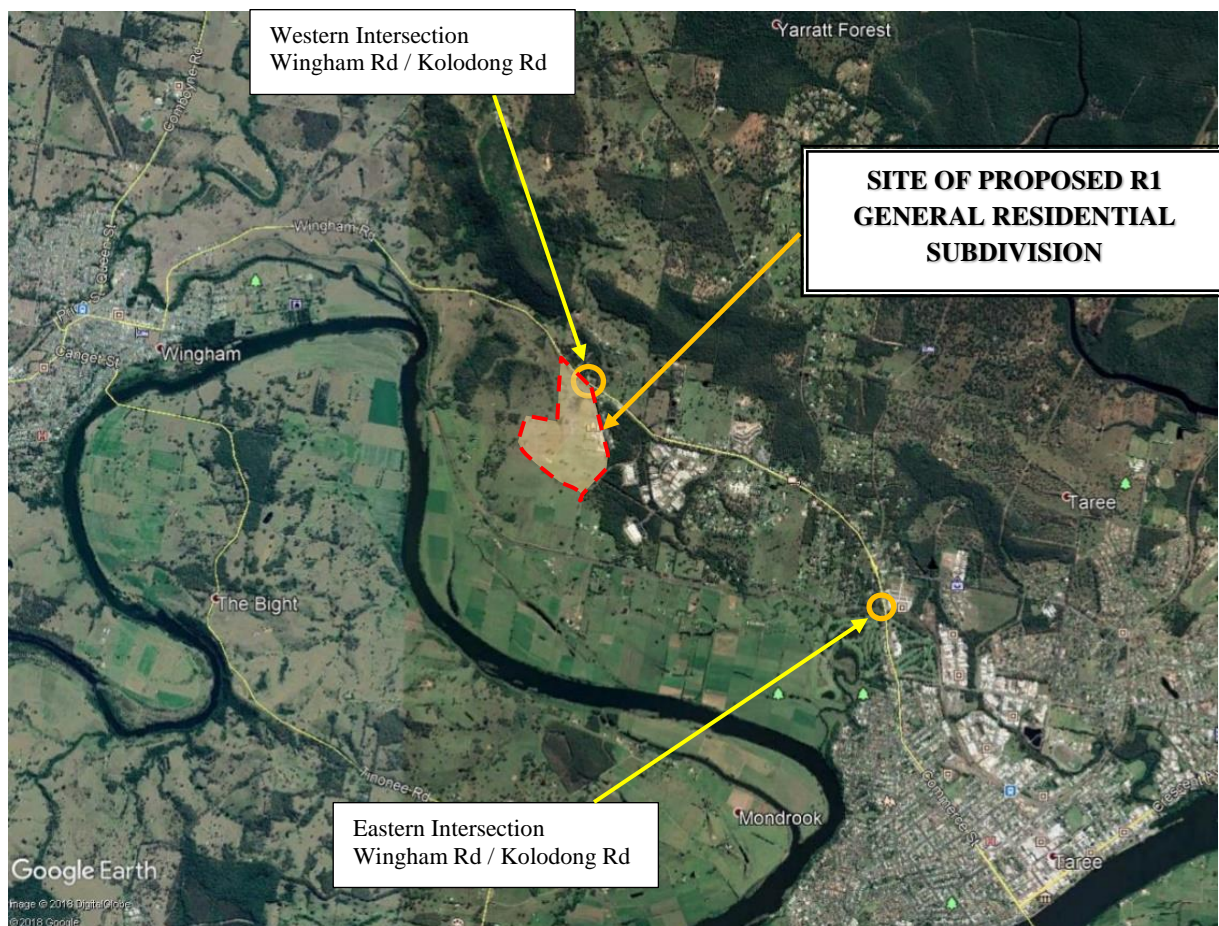
1.0 INTRODUCTION

I have been engaged to provide a preliminary traffic assessment of a Planning Proposal for rezoning of Nos. 353, 423, 441, 443, 445, 461A, 463 and 465 Kolodong Road, Taree.

The subject planning proposal is to rezone the existing properties from RU1 Primary Production to R1 General Residential.

The overall parcels of land are bordered by Kolodong Road on its eastern boundary, Wingham Road on the northern boundary and Neals Lane on its southern boundary.

2.0 LOCALITY DIAGRAMS



(Image Courtesy of Google Earth)

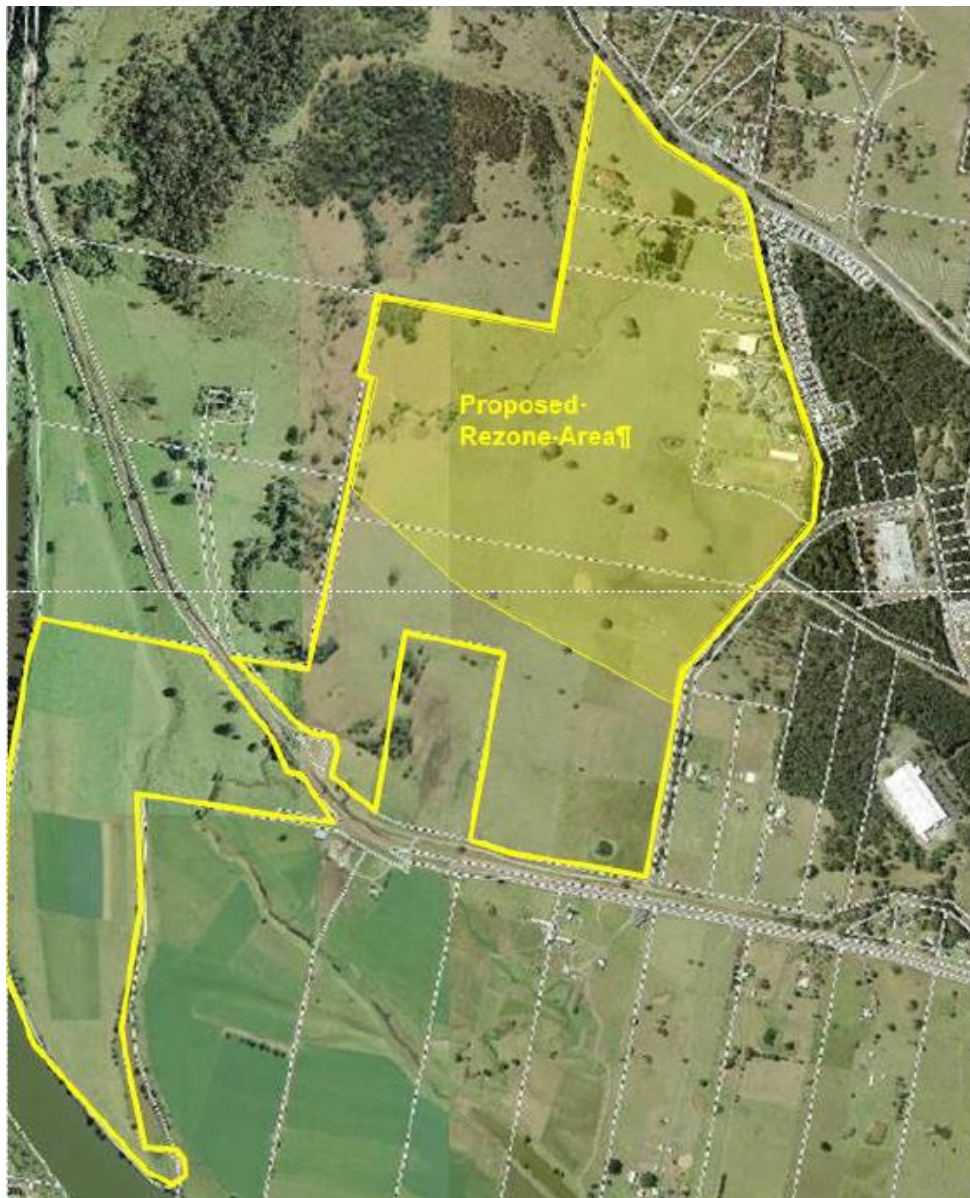


Figure 4 – Aerial Photo of Subject Lands

[Source: LPMA SIX Maps]

Details of land affected by the proposed rezoning are provided in the following extract from the Planning Proposal dated January 2018.

The following information describes the subject lands.

Addresses	353, 423, 441, 443, 445, 461, 461A, 463 & 465 Kolodong Road, Taree
Real Property descriptions	Lot 6 DP 614144 Lots 52, 53 & 54 DP 1042462 Lot 3 DP 607547 Lots 7 & 8 DP 1170882 Lots 5 & 6 DP 833772
Site Area	Combined area approximately 130 hectares
Current controls Greater Taree LEP 2010	Zone - RU1 Primary Production Minimum Subdivision Lot Size – 40 hectares Floor Space Ratio – no Control Height of Buildings – no Control

3.0 TRAFFIC ENVIRONMENT ON KOLODONG ROAD

Kolodong Road is a local road aligned generally east / west and north-south connecting with Wingham Road at two intersections. Kolodong Road currently enjoys variable cross-sections and pavement widths and types.

Kolodong Road has an urban type cross section with grassed footways and no kerb and gutter from Wingham Road south to the Taree Christian College.

There is kerb and gutter along the western side along the frontage of the Taree Baptist Centre and Taree Christian College and kerb and gutter along the eastern side from the exit driveway from the Taree Christian College opposite house number 430 south to the end of the residential dwellings (house number 410).

Kolodong Road has a slight uphill gradient towards the north past the residential development and the Taree Christian College and Taree Baptist Centre and generally straight alignment with a slight bend and crest near the northern end of the 40km/h school zone.

Kolodong Road has no linemarking apart from a short section of BB lines prior to the raised concrete splitter island at the western Wingham Road intersection.

The sealed carriageway width between the kerb and guttered section of Kolodong Road past the Taree Christian College and Taree Baptist Centre is approximately 11.1 metres between kerb faces.

The sealed width between sections without any kerb and gutter is approximately 6.6 metres and slightly variable, widening near the western intersection with Wingham Road.

The existing speed zone on Kolodong Road from the western intersection with Wingham Road to just south of the Taree Christian College is 50km/h, with a 40km/h School Zone past the Taree Christian College on School days.

The existing speed zone from just south of the Taree Christian College to Neals Lane, and from Neals Lane to the eastern intersection with Wingham Road, is 60km/h.

The section of Kolodong Road from Neals Lane to the Taree Christian College has an unsealed gravel pavement with a pavement width of approximately 4.6 metres wide.

The sealed pavement width between Neals Lane and the eastern intersection near Bunnings varies but is essentially 3.7-3.8 metres wide, widening to approximately 5.8 metres closer to the eastern intersection with Wingham Road.

There is a narrow single-lane timber bridge with a 23-tonne load limit signposted, approximately.

4.0 TRAFFIC ENVIRONMENT ON WINGHAM ROAD

Wingham Road is a local road aligned generally east-west at its western intersection with Kolodong Road, and north-south at its eastern intersection with Kolodong Road.

Wingham Road has variable gradients but is relatively level at its intersection with Kolodong Road with slight downgrades towards the east and west either side of the intersection.

Wingham Road has a slightly winding horizontal alignment and sections of rolling vertical alignment due to the terrain through which it is constructed.

The speed zone on Wingham Road is 70km/h past the western intersection with Kolodong Road and 60km/h past the eastern intersection. The speed zone changes approximately 2.4 km east of the western intersection.

There is a right-turn lane on Wingham Road approximately 95 metres long and 3.0 metres wide for eastbound traffic turn into Kolodong Road.

There is a left-turn lane approximately 57 metres long and 3.2 metres wide for westbound traffic to turn into Kolodong Road.

The eastbound and westbound through-lanes vary slightly between 3.6 and 3.7 metres in width.

5.0 ADJOINING ROADS

Kolodong Road is a local road aligned generally north-south, north of Neals Lane, along the southern and eastern boundaries of the properties considered in the planning proposal for rezoning to R1 General Residential.

Kolodong Road east of Neals Lane - aligned generally east-west - also connects with Wingham Road at a T-intersection at its eastern end, approximately 3.3km east of the Neals Lane.

Neals Lane is a “no-through road”.

There is an existing road reserve between Kolodong Road and Hallstrom Avenue, but no physical road constructed to provide a road link.

6.0 POTENTIAL ACCESS LOCATION

The gradients and contours shown on the survey plan of the site of the proposed R1 General Residential rezoning indicate that access would be feasible at the following location, just north of the Taree Baptist Centre.

Lot 54, DP 1042462, approximately 250 metres south of Wingham Road

7.0 POTENTIAL LOT YIELD

The Lots associated with the proposed rezoning are intended to become R1 General Residential zoning. The area of the proposed R1 rezoning is approximately 57.31 Ha.

It is estimated that the land subject of this planning proposal is may yield up to 450 dwelling lots, subject to detailed investigation and design.

8.0 POTENTIAL TRAFFIC GENERATION

Assuming the potential lot yield of 450 lots could be provided, the estimated traffic generation would be as below.

The RMS Technical Direction TDT 2013/04a provides traffic generation data on low density residential dwellings as follows:

Regional Areas

Daily vehicle trips = 7.4 per dwelling

Weekday average morning peak hour vehicle trips = 0.71 per dwelling.

Weekday average evening peak hour vehicle trips = 0.78 per dwelling

The potential maximum traffic generation would therefore be:

450 lots @ 7.4 trips per day	= 3,330 trips
450 lots @ 0.71 trips in weekday morning peak hour	= 320 trips
450 lots @ 0.78 trips in weekday evening peak hour	= 351 trips

The reduction for internal trips within the proposed subdivision has been ignored in this instance.

Traffic generation from residential dwellings is generally distributed as follows:

AM Peak	80% outward trips 20% inward trips
PM Peak	20% outward trips 80% inward trips

The maximum trip generation would therefore be:

AM Peak	256 outward trips 64 inward trips
PM Peak	70 outward trips 281 inward trips

Wingham Road has an AADT of approximately 10,210, based on the morning peak hour volumes east of Kolodong Road of 1,021 vph, and 1015 vph in the evening peak hour.

The additional traffic generated by the proposed R1 General Residential subdivision, if all traffic were to / from the western intersection with Wingham Road, the increase in traffic at the Kolodong Road / Wingham Road intersection would be approximately 31% in the morning peak hour and approximately 35% in the evening peak hour.

The estimated peak hour traffic volumes are likely to have a significant impact on the level of service of the western intersection of Kolodong Road / Wingham Road if all traffic utilised that intersection.

9.0 CAPACITY OF KOLODONG ROAD

The theoretical traffic capacity of Kolodong Road can be assessed from a recognised formula in AUSTRROADS, Guide to Traffic Engineering Practice.

The theoretical roadway capacity is provided by the formula in Section 2.2.1 of the AUSTRROADS Guide to Traffic Engineering Practice, Part 2, Roadway Capacity.

Capacity of a single lane:

$$C = 1800 f_w f_{hv}$$

Where:

C = capacity in vehicles per hour under prevailing roadway and traffic conditions

f_w = adjustment factor for narrow lanes and lateral clearances, (obtained from Table 2.1 in the AUSTRROADS publication)

f_{hv} = adjustment factor for heavy vehicles
= $1 / [1 + P_{hv} (E_{hv} - 1)]$

P_{hv} = the proportion of heavy vehicles in the traffic stream, expressed as a decimal. → *effectively 0 in this instance*

E_{hv} = the average passenger car equivalents for heavy vehicles (obtained from Table 2.2 in the AUSTRROADS publication) → *effectively 4.0 in this instance*

Substitution of the above in the formula is:

$$\begin{aligned} f_{hv} &= 1 \\ f_w &= 0.5 \text{ (for 2.7 m wide lane, and 0m lateral clearance)} \end{aligned}$$

$$\begin{aligned} C &= 1800 \times 0.5 \times 1 \\ C &= 900 \end{aligned}$$

That is, the theoretical capacity of a single lane on Kolodong Road is 900 vehicles per hour.

Public Transport Accessibility

Eggin's Comfort Coaches operates route 319 along Wingham Road between Taree and Wingham.

Bus stops are located infrequently on the eastbound sides of Wingham Road between the two intersections with Kolodong Road

10.0 PEDESTRIAN CONNECTIVITY

There are currently no pedestrian footpaths along the majority of Kolodong Road in the near the land proposed for rezoning to enable low-density residential subdivision.

There are no paved footpaths along Kolodong Road on the section west of Wingham Road.

There are no significant pedestrian attractions near the land proposed for rezoning as R1 General Residential subdivision.

It is likely that pedestrian generation along Kolodong Road would be negligible because of the steep gradients and lack of footpaths.

Fairway Drive has relatively moderate gradients which also provide connectivity to bus routes along Wingham Road, with bus stops each side of Wingham Road just east of Fairway Drive.

11.0 BICYCLE CONNECTIVITY

There are no attractions close to the land proposed for rezoning as subdivision.

Wingham Road has no off-road cycleways and the existing road environment and distance from shops, employment opportunities, hospitality venues and recreational facilities suggests that the proposed subdivision is unlikely to generate a significant volume of bicycle activities outside the subdivision.

The relatively narrow, rolling terrain and condition of the pavement along Kolodong Road south of the Taree Christian College to Neals Lane, particularly between Neals Lane and the eastern intersection with Wingham Road, suggests that bicycle activities along Kolodong Road would be unattractive.

12.0 EMERGENCY VEHICLE ACCESS

In my opinion, it would be sufficient to provide two main vehicular access locations, one to Kolodong Road between the Taree Christian College and Church and Wingham Road and a second access to Kolodong Road approximately 1.15 km south of Wingham Road.

In a residential subdivision accommodating approximately 450 lots, it is highly desirable to provide at least two access points in case of emergencies.

The final access point locations would be subject to detailed design.

Traffic volumes along Kolodong Road south of the Taree Christian College are relatively low because of the rural nature of dwellings in the area, the narrow pavement widths (gravel section \approx 4.6 metres; sealed sections east of Neals Lane \approx 3.7-3.8 metres widening out to approximately 5.8 metres close to the eastern intersection with Wingham Road), road geometry and pavement condition along Kolodong Road between the Taree Christian College and the eastern intersection of Kolodong Road and Wingham Road.

13.0 TRAFFIC VOLUMES AT KOLODONG ROAD / WINGHAM ROAD

Kolodong Road intersects with Wingham Road at two locations – one just north of the railway bridge approximately 630 metres north of Muldoon Street at Taree – referred to as the eastern intersection in this report.

The second intersection of Wingham Road and Kolodong Road, which is the focus of this Traffic Assessment Report, is located approximately 1.27 km north-west of Hargreaves Drive - referred to as the western intersection in this report.

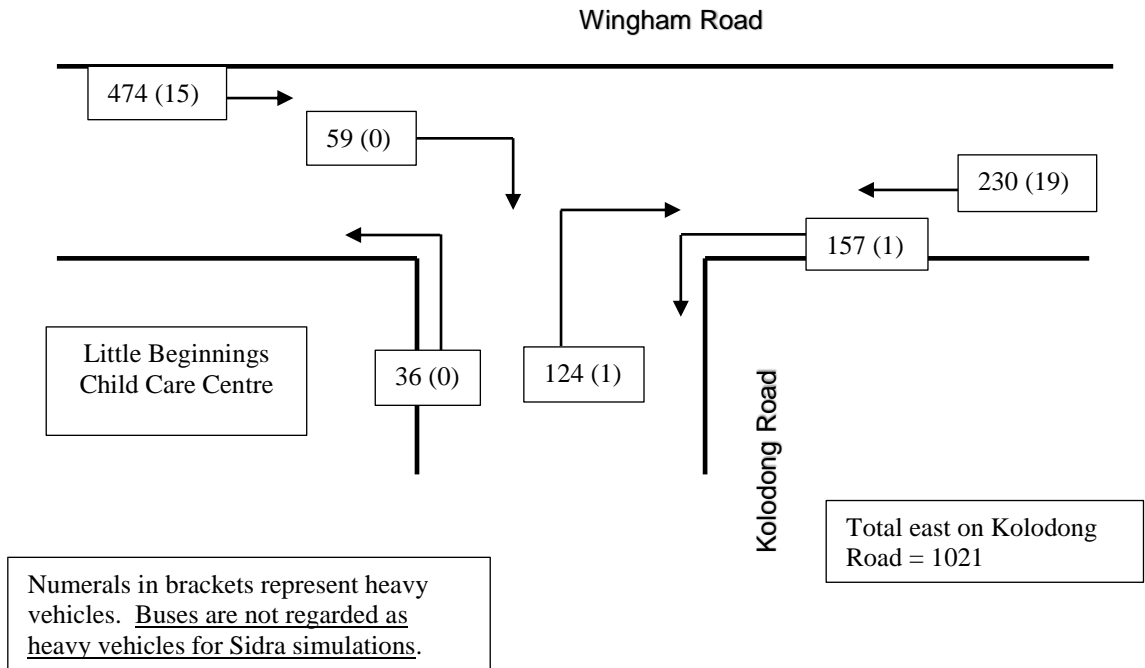
Intersection traffic surveys were undertaken at the western intersection of Wingham Road and Kolodong Road on 18/6/18 and 19/6/18 to determine peak traffic volumes at the intersection and potential traffic impacts using SIDRA simulations of the existing intersection and compare with potential upgrade options if necessary,

Details of the traffic surveys are included as Appendix B.

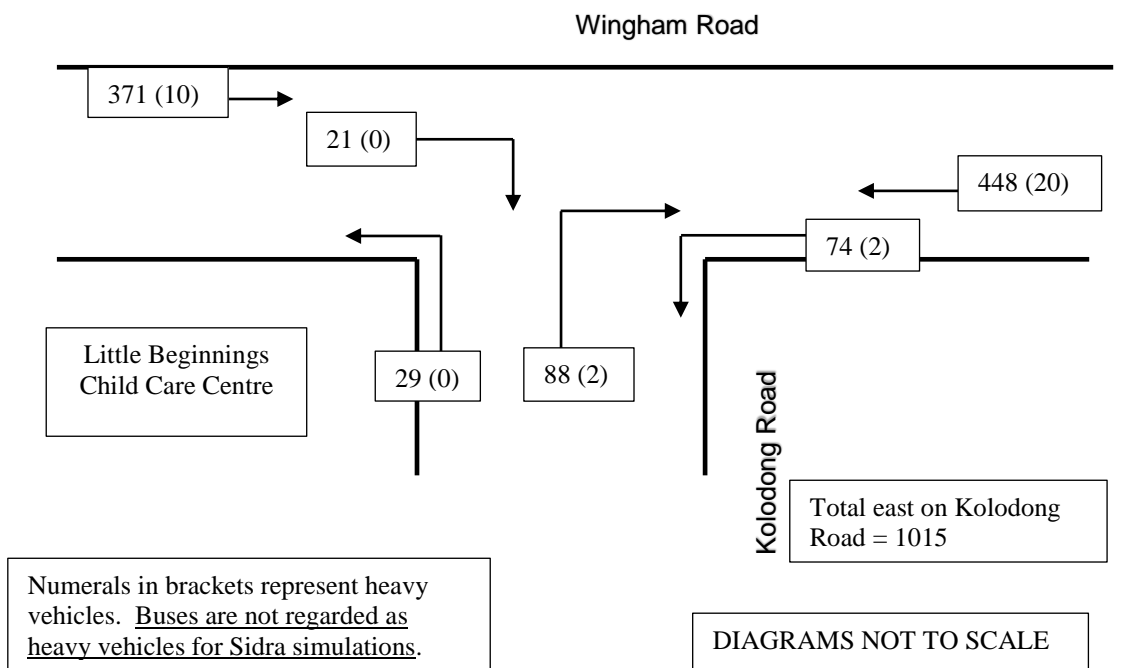
The surveys were undertaken between 7.15 and 9.30am on 19/6/18 and between 2.30 and 5.00pm on 18/6/18 to capture peak intersection volumes particularly associated with the peak traffic volumes associated with the Taree Christian College on Kolodong Road. Peak hourly traffic volumes during the above survey periods were found to be between 8.15 - 9.15am and 2.45 – 3.45pm.

The peak intersection volumes are shown on the following diagrams.

AM Peak



PM Peak



14.0 MODAL DISTRIBUTION OF TRAFFIC GENERATED BY THE PROPOSED RESIDENTIAL SUBDIVISION

The existing Taree Christian College is located approximately 400 metres south of Wingham Road.

At present, access for the proposed residential subdivision is proposed to be only to Kolodong Road.

Two access points are considered necessary to ensure access is available in the event of an emergency where one access may be closed.

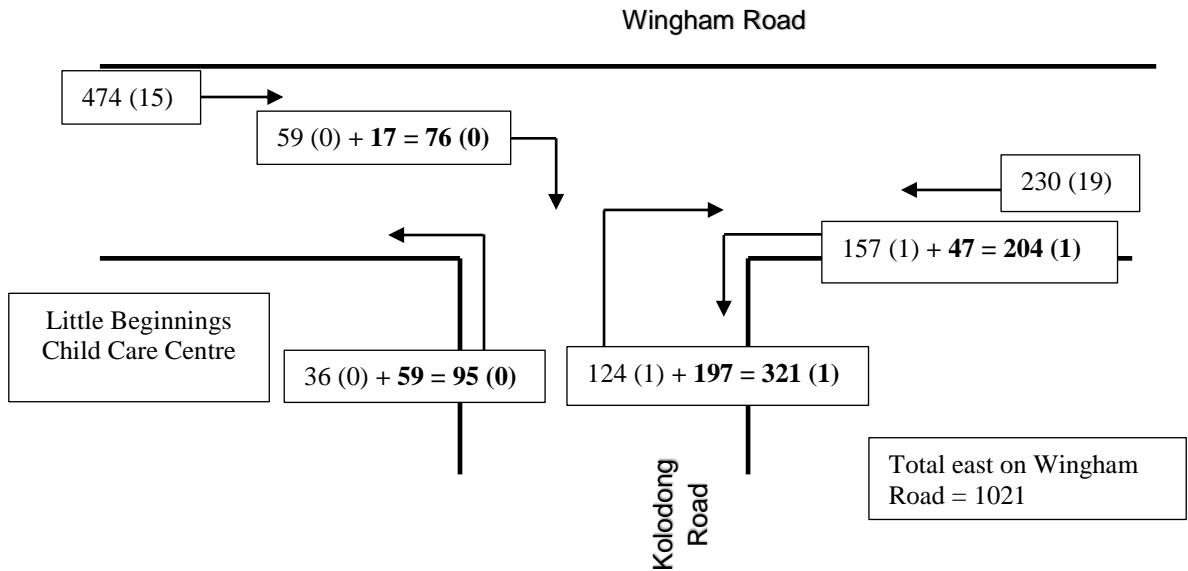
The travel distance from the suggested southern access point travelling south to Neals Lane and east along the narrow sections of Kolodong Road along the to the eastern intersection of Wingham Road and Kolodong Road is approximately 3.5 km. This route traverses narrow pavements with a variable seal width of approximately 3.6 metres and crossing a single lane timber bridge with a 23 tonne load limit and a 60km speed zone is likely to be less attractive than travelling via the western intersection of Wingham Road and Kolodong Road

The travel distance from the suggested southern access point travelling north along Kolodong Road and then east along Wingham Road to the eastern intersection of Wingham Road and Kolodong Road is approximately 4.65 km. This route traverses better standard roads with a 50km/h speed zone from the Taree Christian College and a 70km/h speed zone on Wingham Road for approximately 2.4 km but may be more attractive to many drivers, particularly outside school peak hours

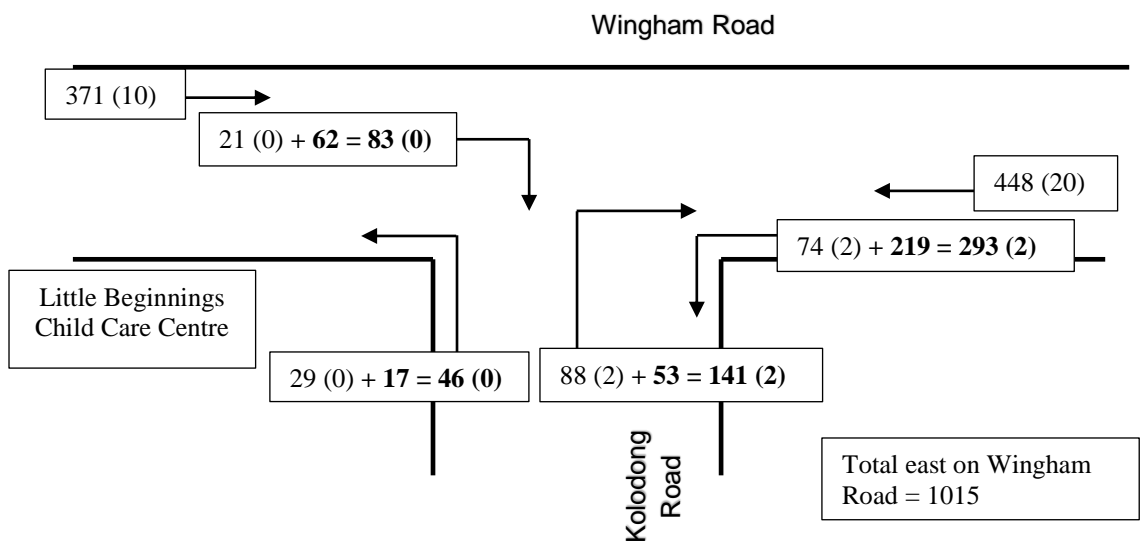
A new industrial subdivision is also proposed east of Kolodong Road that will provide a new intersection with Wingham Road – refer to Figure B6.

Traffic generated by the proposed residential subdivision added to the existing traffic volumes, distributed in accordance with existing traffic patterns, are depicted in the following diagrams. The traffic volumes added reflect the residential subdivision fully completed and occupied.

AM Peak - 2018



PM Peak - 2018



Numerals in brackets represent heavy vehicles. Buses are not regarded as heavy vehicles for Sidra simulations.

DIAGRAMS NOT TO SCALE

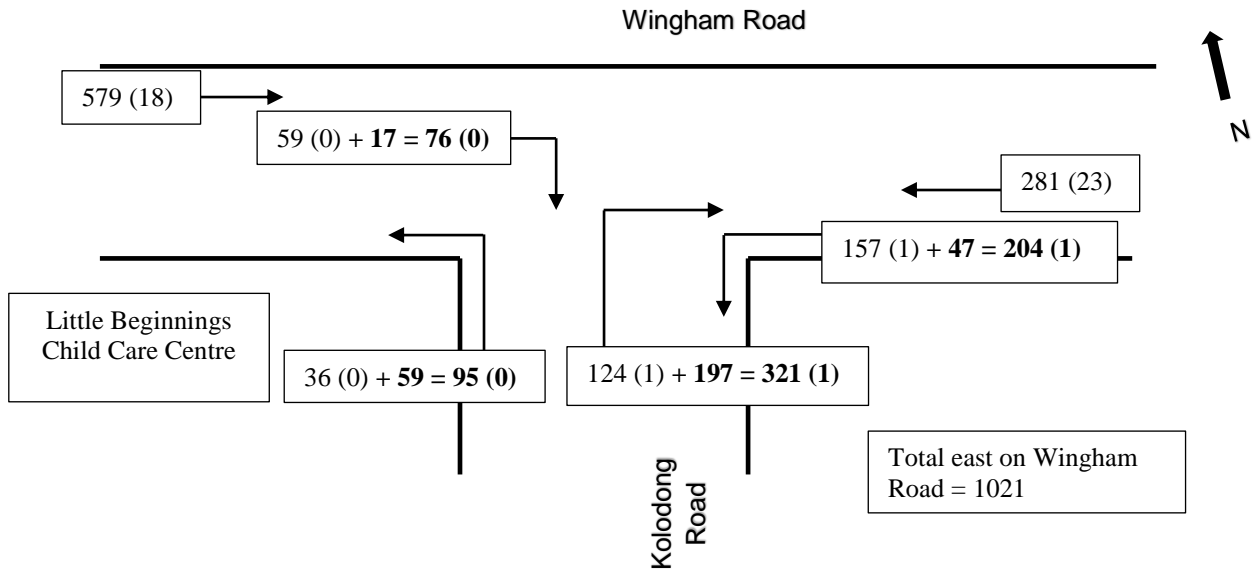
2028 TRAFFIC VOLUMES

Traffic volumes have been projected for year 2028 to assess how the existing eastern intersection of Kolodong Road / Wingham Road using an average annual rate of traffic growth of 2% on Wingham Road.

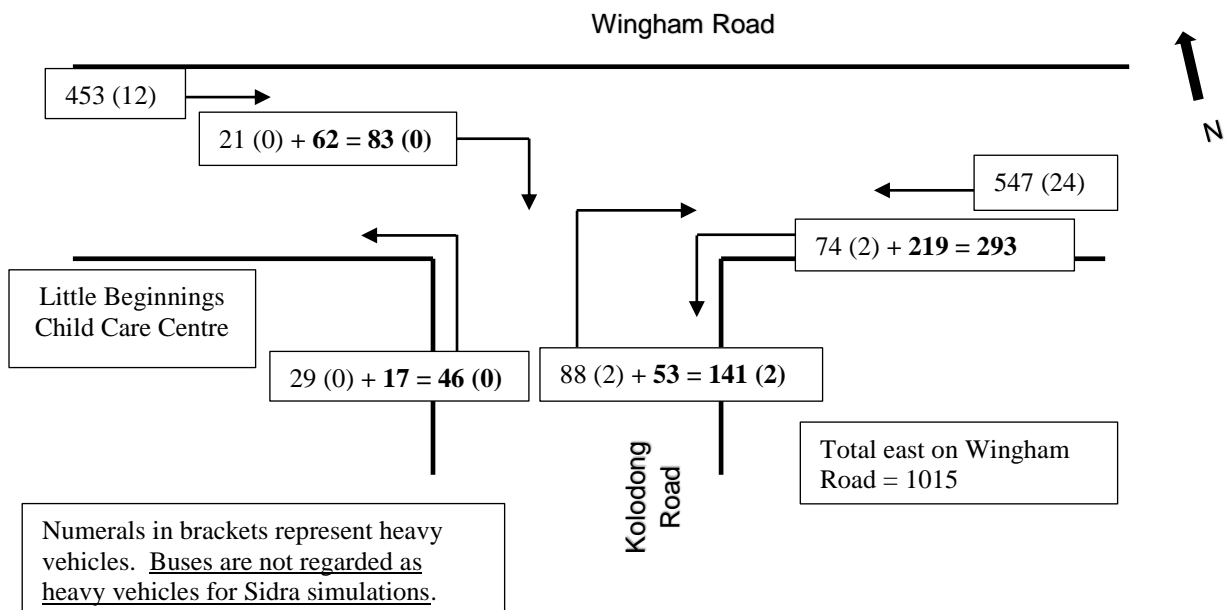
It is assumed that traffic along Kolodong Road would essentially be unchanged.

The projected 2028 peak hour traffic volumes are depicted on the following diagrams.

AM Peak - 2028



PM Peak - 2028



15.0 SIDRA SIMULATIONS

SIDRA simulations have been undertaken for the western intersection of Wingham Road and Kolodong Road to assess potential impacts of any additional traffic generated onto it by the proposed residential subdivision.

The existing western channelised intersection has been assessed for existing traffic and with the additional subdivision traffic superimposed, assuming a worst-case scenario that 100% of subdivision would utilise that intersection. SIDRA simulations have also been undertaken for a seagull intersection and a typical single-lane roundabout at the same intersection.

A SIDRA simulation was also been undertaken for projected 2028 traffic volumes on Wingham Road with no subdivision traffic included in or out of Kolodong Road.

The SIDRA program was developed in conjunction with ARRB Transport Research Ltd to analyse the operation of intersections controlled by traffic signals, Give Way signs, Stop signs, conventional roundabouts and signal-controlled roundabouts. It is widely used by consulting traffic engineers and is recognized and used by the Roads and Traffic Authority of NSW. SIDRA is now owned and developed by Akcelik & Associates Pty Ltd.

The parameters used in the SIDRA program are measured against the following performance standards developed by the Roads and Traffic Authority of NSW and the American Transportation Research Board.

Table 15.1 – Level of Service for Unsignalised Intersections Controlled by Stop or Give Way Signs.

Average Delay per vehicle (secs)	Level of Service	Operational Conditions
0 to 14	A	Good
15 to 28	B	Acceptable delays and spare capacity
29 to 42	C	Satisfactory but accident study required
43 to 56	D	Near capacity and accident study required
57 to 70	E	At capacity and requires other control mode
> 70	F	Unsatisfactory and requires other control mode

Existing Intersection Assessment

Table 15.2: Average Delays per Movement for 2018 Traffic – AM Peak (Existing Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	11.0	A	17.9
Northbound on Kolodong Road right into Wingham Road	24.5	B	17.9
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.1	A	1.7
Overall Average Delays (secs / veh)	4.4	NA	17.9

The SIDRA simulations indicate that the 95% queue lengths over the morning peak hour are satisfactory with all movements at Level of Service A or B, using the existing intersection. However, observations during the survey indicated that the maximum queue lengths were considerably longer over a shorter period.

A considerable number of buses of various sizes that attend the Taree Christian School adversely impact on the maximum queue length.

Table 15.3: Average Delays per Movement for 2018 Traffic – PM Peak (Existing Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	11.0	A	12.2
Northbound on Kolodong Road right into Wingham Road	23.3	B	12.2
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.9	A	0.7
Overall Average Delays (secs / veh)	2.9	NA	12.2

The SIDRA simulations indicate that the 95% queue lengths over the afternoon peak hour are satisfactory with all movements at Level of Service A or B, using the existing intersection. However, observations during the survey indicated that the maximum queue lengths were considerably longer over a shorter period.

A considerable number of buses of various sizes that attend the Taree Christian School adversely impact on the maximum queue length.

Seagull Intersection Assessment

Table 15.4: Average Delays per Movement for 2018 Traffic – AM Peak (Seagull Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	6.9	A	7.0
Northbound on Kolodong Road right into Wingham Road	9.4	A	7.0
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.1	A	1.7
Overall Average Delays (secs / veh)	2.6	NA	7.0

The SIDRA simulations indicate that the 95% queue lengths over the morning peak hour are satisfactory with all movements at Level of Service A, if a seagull intersection were provided. However, it is likely that the maximum queue lengths would remain considerably longer over a shorter period.

A considerable number of buses of various sizes that attend the Taree Christian School adversely impact on the maximum queue length.

The potential volume of additional traffic that could be generated by the subject residential subdivision past the school could adversely impact on the operation of traffic attending the Taree Christian College and maximum queue lengths are likely to still be unacceptable.

Table 15.5: Average Delays per Movement for 2018 Traffic – PM Peak (Seagull Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	8.5	A	6.3
Northbound on Kolodong Road right into Wingham Road	11.7	A	6.3
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.9	A	0.7
Overall Average Delays (secs / veh)	1.9	NA	6.3

The SIDRA simulations indicate that the 95% queue lengths over the afternoon peak hour are satisfactory with all movements at Level of Service A, if a seagull intersection were provided. However, it is likely that the maximum queue lengths would remain considerably longer over a shorter period.

A considerable number of buses of various sizes that attend the Taree Christian School adversely impact on the maximum queue length.

The potential volume of additional traffic that could be generated by the subject residential subdivision past the school could adversely impact on the operation of traffic attending the Taree Christian College and maximum queue lengths are likely to still be unacceptable.

Roundabout Assessment

Level of Service for Roundabouts.

Average Delay per vehicle (secs)	Level of Service	Operational Conditions
0 to 14	A	Good
15 to 28	B	Acceptable delays and spare capacity
29 to 42	C	Satisfactory
43 to 56	D	Near capacity
57 to 70	E	At capacity and requires other control mode
> 70	F	Unsatisfactory and requires other control mode

Table 15.6: Average Delays per Movement for 2018 Traffic – AM Peak (Roundabout)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	6.2	A	5.8
Northbound on Kolodong Road right into Wingham Road	9.4	A	5.8
Westbound on Wingham Road left into Kolodong Road	6.2	A	4.8
Westbound through on Wingham Road	6.0	A	7.7
Eastbound through on Wingham Road	6.5	A	19.2
Eastbound on Wingham Road right into Kolodong Road	10.2	A	2.7
Overall Average Delays (secs / veh)	6.9	NA	19.2

The SIDRA simulations indicate that the 95% queue lengths over the morning peak hour are satisfactory with all movements at Level of Service A, if a roundabout were provided.

However, it is possible that the maximum queue lengths on Kolodong Road would remain considerably longer over a shorter period because of the higher dominant flows along Wingham Road over a shorter period.

The potential volume of additional traffic that could be generated by the subject residential subdivision past the school could adversely impact on the operation of traffic attending the Taree Christian College and maximum queue lengths are likely to still be unacceptable.

A roundabout option would also introduce delays to through-vehicle movements on Wingham Road 24 hours a day. with subsequent queuing on Wingham Road during the morning peak traffic period.

Table 15.7: Average Delays per Movement for 2018 Traffic – PM Peak (Roundabout)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	7.5	A	5.1
Northbound on Kolodong Road right into Wingham Road	10.8	A	5.1
Westbound on Wingham Road left into Kolodong Road	6.1	A	2.8
Westbound through on Wingham Road	5.8	A	13.9
Eastbound through on Wingham Road	6.2	A	13.6
Eastbound on Wingham Road right into Kolodong Road	9.8	A	0.9
Overall Average Delays (secs / veh)	6.5	NA	13.9

The SIDRA simulations indicate that the 95% queue lengths over the afternoon peak hour are satisfactory with all movements at Level of Service A, if a roundabout were provided.

However, it is possible that the maximum queue lengths on Kolodong Road would remain considerably longer over a shorter period because of the higher dominant flows along Wingham Road over a shorter period.

The potential volume of additional traffic that could be generated by the subject residential subdivision past the school could adversely impact on the operation of traffic attending the Taree Christian College and maximum queue lengths are likely to still be unacceptable.

A roundabout option would also introduce delays to through-vehicle movements on Wingham Road 24 hours a day, with subsequent queuing on Wingham Road during evening peak traffic period.

Table 15.8: Average Delays per Movement for 2018 Traffic + 100% Subdivision Traffic – AM Peak (Existing Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	653.7	F	1,023.3
Northbound on Kolodong Road right into Wingham Road	668.3	F	1,023.3
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.4	A	2.3
Overall Average Delays (secs / veh)	194.5	NA	1,023.3

The SIDRA simulations indicate that the 95% queue lengths over the morning peak hour are unsatisfactory with movements from Kolodong Road at Level of Service F, using the existing intersection.

The potential volume of additional traffic that could be generated by the subject residential subdivision would adversely impact on the operation of the existing intersection and average delays and maximum queue lengths for the Kolodong Road leg are unacceptable.

Table 15.9: Average Delays per Movement for 2018 Traffic + 100% Subdivision Traffic – PM Peak (Existing Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	31.8	C	41.0
Northbound on Kolodong Road right into Wingham Road	51.7	D	41.0
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	11.1	A	3.6
Overall Average Delays (secs / veh)	8.2	NA	41.0

The SIDRA simulations indicate that the 95% queue lengths over the afternoon peak hour are unsatisfactory with movements out of Kolodong Road at Level of Service E or F, using the existing intersection.

The potential volume of additional traffic that could be generated by the subject residential subdivision would further impact on the operation of the existing intersection and average delays and maximum queue lengths for the Kolodong Road leg are unacceptable.

Right-turns out of Kolodong Road are likely to be near capacity at Level of Service D.

Table 15.10: Average Delays per Movement for 2018 Traffic + 100% Subdivision Traffic – AM Peak (Seagull Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	10.5	A	41.1
Northbound on Kolodong Road right into Wingham Road	14.8	B	41.1
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.4	A	2.3
Overall Average Delays (secs / veh)	5.4	NA	41.1

The SIDRA simulations indicate that the 95% queue lengths over the morning peak hour are satisfactory with all movements at Level of Service A, if a seagull intersection were provided.

A considerable number of buses of various sizes that attend the Taree Christian School adversely impact on the maximum queue length.

A seagull intersection would perform considerably better than the existing intersection in the 2018 AM peak if the proposed residential subdivision were fully occupied now. All movements would operate at Level of Service A or B.

Table 15.11: Average Delays per Movement for 2018 Traffic + 100% Subdivision Traffic – PM Peak (Seagull Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	10.9	A	16.4
Northbound on Kolodong Road right into Wingham Road	17.8	B	16.4
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	11.1	A	3.6
Overall Average Delays (secs / veh)	4.1	NA	16.4

The SIDRA simulations indicate that the 95% queue lengths over the afternoon peak hour are satisfactory with all movements at Level of Service A, if a seagull intersection were provided.

A considerable number of buses of various sizes that attend the Taree Christian School adversely impact on the maximum queue length.

A seagull intersection would perform considerably better than the existing intersection in the 2018 PM peak if the proposed residential subdivision were fully occupied now. All movements would operate at Level of Service A or B.

Table 15.12: Average Delays per Movement for 2018 Traffic + 100% Subdivision Traffic – AM Peak (Roundabout)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	6.6	A	18.3
Northbound on Kolodong Road right into Wingham Road	9.8	A	18.3
Westbound on Wingham Road left into Kolodong Road	6.2	A	6.6
Westbound through on Wingham Road	6.1	A	8.5
Eastbound through on Wingham Road	8.1	A	25.6
Eastbound on Wingham Road right into Kolodong Road	12.4	A	4.5
Overall Average Delays (secs / veh)	8.0	NA	25.6

The SIDRA simulations indicate that the 95% queue lengths over the morning peak hour are satisfactory with all movements at Level of Service A, if a roundabout were provided.

However, it is possible that the maximum queue lengths on Kolodong Road would remain considerably longer over a shorter period because of the higher dominant flows along Wingham Road over a shorter period.

The potential volume of additional traffic that could be generated by the subject residential subdivision past the school could adversely impact on the operation of traffic attending the Taree Christian College and maximum queue lengths are likely to still be unacceptable.

A roundabout option would also introduce delays to through-vehicle movements on Wingham Road 24 hours a day, with subsequent queuing on Wingham Road during morning peak traffic period.

Table 15.13: Average Delays per Movement for 2018 Traffic + 100% Subdivision Traffic – PM Peak (Roundabout)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	7.7	A	9.0
Northbound on Kolodong Road right into Wingham Road	11.0	A	9.0
Westbound on Wingham Road left into Kolodong Road	6.4	A	10.4
Westbound through on Wingham Road	6.2	A	16.9
Eastbound through on Wingham Road	6.6	A	14.9
Eastbound on Wingham Road right into Kolodong Road	10.5	A	4.1
Overall Average Delays (secs / veh)	7.1	NA	16.9

The SIDRA simulations indicate that the 95% queue lengths over the afternoon peak hour are satisfactory with all movements at Level of Service A, if a roundabout were provided.

However, it is possible that the maximum queue lengths on Kolodong Road would remain considerably longer over a shorter period because of the higher dominant flows along Wingham Road over a shorter period.

The potential volume of additional traffic that could be generated by the subject residential subdivision past the school could adversely impact on the operation of traffic attending the Taree Christian College and maximum queue lengths are likely to still be unacceptable.

A roundabout option would also introduce delays to through-vehicle movements on Wingham Road 24 hours a day, with subsequent queuing on Wingham Road during evening peak traffic period.

Table 15.14: Average Delays per Movement for 2028 Traffic – AM Peak (Existing Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	20.6	B	27.7
Northbound on Kolodong Road right into Wingham Road	41.1	C	27.7
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.4	A	1.8
Overall Average Delays (secs / veh)	5.8	NA	27.7

The SIDRA simulations indicate that the 95% queue lengths over the 2028 morning peak hour are likely to be worse than the existing queue lengths with movements out of Kolodong Road being at Level of Service B for the left-turn out and C for the right-turn out.

Table 15.15: Average Delays per Movement for 2028 Traffic – PM Peak (Existing Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	18.1	B	18.5
Northbound on Kolodong Road right into Wingham Road	37.7	C	18.5
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	9.8	A	0.8
Overall Average Delays (secs / veh)	3.7	NA	18.5

The SIDRA simulations indicate that the 95% queue lengths over the 2028 evening peak hour are likely to be worse than the existing queue lengths with movements out of Kolodong Road being at Level of Service B for the left-turn out and C for the right-turn out.

Table 15.16: Average Delays per Movement for 2028 Traffic + Subdivision 100% occupied – AM Peak (Existing Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	1,608.6	F	1,777.2
Northbound on Kolodong Road right into Wingham Road	1,622.3	F	1,777.2
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.8	A	2.5
Overall Average Delays (secs / veh)	423.5	NA	1,777.2

The SIDRA simulations indicate that the 95% queue lengths over the 2028 morning peak hour with all lots in the proposed residential subdivision being occupied are likely to be considerably worse than the existing queue lengths with movements out of Kolodong Road being at Level of Service F for the left-turn out and F for the right-turn out.

The SIDRA simulations indicate that queue lengths and average delays are likely to be excessive on Kolodong Road in the 2028 morning peak.

Table 15.17: Average Delays per Movement for 2028 Traffic + Subdivision 100% occupied – PM Peak (Existing Intersection Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	372.0	F	304.0
Northbound on Kolodong Road right into Wingham Road	398.1	F	304.0
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	12.4	A	4.1
Overall Average Delays (secs / veh)	48.1	NA	304.0

The SIDRA simulations indicate that the 95% queue lengths over the 2028 evening peak hour with all lots in the proposed residential subdivision being occupied are likely to be considerably worse than the existing queue lengths with movements out of Kolodong Road being at Level of Service F for the left-turn out and F for the right-turn out.

The SIDRA simulations indicate that queue lengths and average delays are likely to be excessive on Kolodong Road in the 2028 evening peak.

Table 15.18: Average Delays per Movement for 2028 Traffic + Subdivision 100% occupied – AM Peak (Seagull Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	12.4	A	47.5
Northbound on Kolodong Road right into Wingham Road	17.3	B	47.5
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	8.8	A	2.5
Overall Average Delays (secs / veh)	5.5	NA	47.5

The SIDRA simulations indicate that average delays over the 2028 morning peak hour with all lots in the proposed residential subdivision being occupied, are likely to be similar to the existing 2018 morning delays with movements out of Kolodong Road being at Level of Service A for the left-turn out and B for the right-turn out.

The SIDRA simulations indicate that the 95% queue lengths over the 2028 morning peak hour with all lots in the proposed residential subdivision being occupied are likely to be longer than the existing queue lengths.

Table 15.19: Average Delays per Movement for 2028 Traffic + Subdivision 100% occupied – PM Peak (Seagull Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	14.2	A	20.7
Northbound on Kolodong Road right into Wingham Road	23.1	B	20.7
Westbound on Wingham Road left into Kolodong Road	6.4	A	0
Westbound through on Wingham Road	0	A	0
Eastbound through on Wingham Road	0	A	0
Eastbound on Wingham Road right into Kolodong Road	12.4	A	4.2
Overall Average Delays (secs / veh)	5.5	NA	47.5

The SIDRA simulations indicate that average delays over the 2028 evening peak hour with all lots in the proposed residential subdivision being occupied, are likely to be similar to the existing 2018 evening delays with movements out of Kolodong Road being at Level of Service A for the left-turn out and B for the right-turn out.

The SIDRA simulations indicate that the 95% queue lengths over the 2028 evening peak hour with all lots in the proposed residential subdivision being occupied are likely to be slightly longer than the existing queue lengths.

Table 15.20: Average Delays per Movement for 2028 Traffic + Subdivision 100% occupied – AM Peak (Roundabout Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	7.1	A	19.7
Northbound on Kolodong Road right into Wingham Road	10.3	B	19.7
Westbound on Wingham Road left into Kolodong Road	6.3	A	6.9
Westbound through on Wingham Road	6.1	A	10.7
Eastbound through on Wingham Road	8.8	A	37.9
Eastbound on Wingham Road right into Kolodong Road	12.4	A	4.5
Overall Average Delays (secs / veh)	8.4	NA	37.9

The SIDRA simulations indicate that average delays over the 2028 morning peak hour with all lots in the proposed residential subdivision being occupied, are likely to be less than the existing 2018 morning delays with movements out of Kolodong Road being at Level of Service A for the left-turn out and B for the right-turn out.

The SIDRA simulations indicate that the 95% queue lengths over the 2028 morning peak hour with all lots in the proposed residential subdivision being occupied are likely to be similar to the existing queue lengths. The 95% queue lengths for eastbound traffic on Wingham Road would be relatively significant at 37.9 metres in the morning peak.

However, the roundabout option would also introduce delays to through-vehicle movements on Wingham Road 24 hours a day. with subsequent queuing on Wingham Road during the morning peak traffic period.

Table 15.22: Average Delays per Movement for 2028 Traffic + Subdivision 100% occupied – PM Peak (Roundabout Geometry)

Movement	Average Delay for Movement (secs / veh)	Level of Service	95% Queue Length (m)
Northbound on Kolodong Road left into Wingham Road	8.6	A	10.2
Northbound on Kolodong Road right into Wingham Road	11.9	B	10.2
Westbound on Wingham Road left into Kolodong Road	6.4	A	11.1
Westbound through on Wingham Road	6.2	A	22.3
Eastbound through on Wingham Road	6.6	A	19.7
Eastbound on Wingham Road right into Kolodong Road	10.5	A	4.2
Overall Average Delays (secs / veh)	7.2	NA	22.3

The SIDRA simulations indicate that average delays over the 2028 evening peak hour with all lots in the proposed residential subdivision being occupied, are likely to be less than the existing 2018 morning delays with movements out of Kolodong Road being at Level of Service A for the left-turn out and B for the right-turn out.

The SIDRA simulations indicate that the 95% queue lengths over the 2028 evening peak hour with all lots in the proposed residential subdivision being occupied are likely to be similar to the existing queue lengths. The 95% queue lengths for westbound traffic on Wingham Road would be relatively significant at 22.3 metres in the evening peak.

However, the roundabout option would also introduce delays to through-vehicle movements on Wingham Road 24 hours a day. with subsequent queuing on Wingham Road during the morning peak traffic period.

16.0 SUMMARY

The proposed rezoning of several existing lots to R1 General Residential may enable a subdivision with a potential yield of approximately 450 residential lots estimated to generate approximately 320 trips in the weekday morning peak period and 351 trips in the weekday evening peak period.

It is proposed to be provided on Lot 54 DP 1042462, approximately 250 metres south of Wingham Road, approximately as indicated by Figure B1 in Appendix B, whereby traffic volumes would be directed to Wingham Road north of the Taree Christian Christian College and the Taree Baptist Centre.

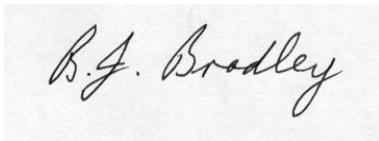
In my opinion, there would be negligible traffic, pedestrian or bicycle impacts likely to result in any adverse safety impacts resulting from the proposed R1 General Residential rezoning at Kolodong Road, Taree as there is unlikely to be any additional subdivision traffic directed south along Kolodong Road past the Taree Christian College and Taree Christian College.

Upgrading of the intersection of Kolodong Road and Wingham Road is desirable given the existing performance of the intersection in the morning and evening peak periods. The additional traffic associated with the proposed residential subdivision would increase slowly over many years as the subdivision is constructed and occupied.

Costs for any upgrading of the intersection of Kolodong Road and Wingham Road should be on a share basis between the major traffic generators, the Taree Christian Christian College, the Taree Baptist Centre and the proposed residential subdivision which is the subject of the Planning Proposal.

In my opinion, a seagull intersection would provide a suitable alternative solution to cater for projected traffic utilising the intersection of the next 10 years or so. A seagull intersection offers performance improvements by 2028 to that of a roundabout.

Installation of a roundabout would introduce delays to through-vehicle movements on Wingham Road 24 hours a day, with subsequent queuing on Wingham Road during the peak traffic periods.



B J Bradley BE Grad Dip Man MIE Aust

APPENDIX A

SITE PHOTOS



Photo No. 1: Looking left (generally west) along Wingham Road from Kolodong Road showing the existing traffic environment and sight distances.



Photo No. 2: Looking right (generally east) along Wingham Road from Kolodong Road showing the existing traffic environment and sight distances.



Photo No. 3: Looking generally south along Kolodong Road from Wingham Road showing the existing traffic environment.



Photo No. 4: Looking generally south-east across Wingham Road from showing the existing traffic environment at the western intersection with Kolodong Road.



Photo No. 5: Looking generally north along Kolodong Road from just north of the Taree Baptist Centre showing the existing traffic environment.



Photo No. 6: Looking generally south along Kolodong Road showing the existing traffic environment past the Taree Christian College towards the end of the existing sealed pavement.



Photo No. 7: Looking generally south along Kolodong Road from south of the Taree Christian College showing the gravel pavement and traffic environment.



Photo No. 8: Looking generally south along Kolodong Road towards Neals Lane showing the existing traffic environment and gravel pavement with part of the site for the rezoning on the right.



Photo No. 9: Looking generally east along Kolodong Road towards the eastern intersection with Wingham Road showing the existing traffic environment approaching Wingham Road.



Photo No. 10: Typical traffic environment on Kolodong Road between Neals Lane and the eastern intersection with Wingham Road.

APPENDIX B

SUGGESTED ACCESS LOCATIONS

Figure B1



Indicative Location of Access to new Residential Subdivision

(Image Courtesy of Six Maps)

APPENDIX C

SIDRA DATA

MOVEMENT SUMMARY

▽ Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2018 AM Peak]

Existing Tee Geometry
 Site Category: (None)
 GiveWay / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kolodong Rd south												
1	L2	36	0.0	0.493	11.0	LOS A	2.5	17.9	0.75	0.98	1.15	45.3
3	R2	125	0.8	0.493	24.5	LOS B	2.5	17.9	0.75	0.98	1.15	45.2
Approach		161	0.6	0.493	21.5	LOS B	2.5	17.9	0.75	0.98	1.15	45.2
East: Wingham Road east												
4	L2	158	0.6	0.088	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	249	7.6	0.135	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	70.0
Approach		407	4.9	0.135	2.5	NA	0.0	0.0	0.00	0.24	0.00	65.6
West: Wingham Road west												
11	T1	489	3.1	0.253	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	59	0.0	0.063	8.1	LOS A	0.2	1.7	0.45	0.68	0.45	54.7
Approach		548	2.7	0.253	0.9	NA	0.2	1.7	0.05	0.07	0.05	67.9
All Vehicles		1116	3.2	0.493	4.4	NA	2.5	17.9	0.13	0.26	0.19	62.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2018 PM Peak]

Existing Tee Geometry
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Kolodong Rd south												
1	L2	29	0.0	0.388	11.0	LOS A	1.7	12.2	0.79	0.99	1.04	46.0
3	R2	90	2.2	0.388	23.3	LOS B	1.7	12.2	0.79	0.99	1.04	45.8
Approach		119	1.7	0.388	20.3	LOS B	1.7	12.2	0.79	0.99	1.04	45.9
East: Wingham Road east												
4	L2	76	2.6	0.043	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.6
5	T1	468	4.3	0.248	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		544	4.0	0.248	0.9	NA	0.0	0.0	0.00	0.09	0.00	68.3
West: Wingham Road west												
11	T1	381	2.6	0.195	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	21	0.0	0.027	8.9	LOS A	0.1	0.7	0.51	0.70	0.51	54.0
Approach		402	2.5	0.195	0.5	NA	0.1	0.7	0.03	0.04	0.03	68.9
All Vehicles		1065	3.2	0.388	2.9	NA	1.7	12.2	0.10	0.17	0.13	64.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2018 AM Peak + 100% Subdivision]

Existing Tee Geometry
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kolodong Rd south												
1	L2	95	0.0	1.351	653.7	LOS F	145.9	1023.3	1.00	8.31	25.54	5.0
3	R2	322	0.3	1.351	668.3	LOS F	145.9	1023.3	1.00	8.31	25.54	5.0
Approach		417	0.2	1.351	664.9	LOS F	145.9	1023.3	1.00	8.31	25.54	5.0
East: Wingham Road east												
4	L2	205	0.5	0.114	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	249	7.6	0.135	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	70.0
Approach		454	4.4	0.135	2.9	NA	0.0	0.0	0.00	0.27	0.00	64.9
West: Wingham Road west												
11	T1	489	3.1	0.252	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	76	0.0	0.085	8.4	LOS A	0.3	2.3	0.48	0.71	0.48	54.5
Approach		565	2.7	0.252	1.2	NA	0.3	2.3	0.06	0.10	0.06	67.4
All Vehicles		1436	2.5	1.351	194.5	NA	145.9	1023.3	0.32	2.54	7.44	14.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2018 PM Peak + 100% Subdivision]

Existing Tee Geometry
 Site Category: (None)
 GiveWay / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kolodong Rd south												
1	L2	46	0.0	0.803	31.8	LOS C	5.8	41.0	0.92	1.38	2.40	34.4
3	R2	143	1.4	0.803	51.7	LOS D	5.8	41.0	0.92	1.38	2.40	34.4
Approach		189	1.1	0.803	46.9	LOS D	5.8	41.0	0.92	1.38	2.40	34.4
East: Wingham Road east												
4	L2	295	0.7	0.164	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	468	4.3	0.248	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		763	2.9	0.248	2.5	NA	0.0	0.0	0.00	0.24	0.00	65.6
West: Wingham Road west												
11	T1	381	2.6	0.196	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	83	0.0	0.139	11.1	LOS A	0.5	3.6	0.62	0.86	0.62	52.4
Approach		464	2.2	0.196	2.0	NA	0.5	3.6	0.11	0.15	0.11	66.0
All Vehicles		1416	2.4	0.803	8.2	NA	5.8	41.0	0.16	0.36	0.36	58.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2018 AM Peak_Seagull]

Existing Tee Geometry
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kolodong Rd south												
1	L2	36	0.0	0.232	6.9	LOS A	1.0	7.0	0.52	0.73	0.52	53.7
3	R2	125	0.8	0.232	9.4	LOS A	1.0	7.0	0.52	0.73	0.52	53.5
Approach		161	0.6	0.232	8.9	LOS A	1.0	7.0	0.52	0.73	0.52	53.6
East: Wingham Road east												
4	L2	158	0.6	0.088	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	249	7.6	0.135	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	70.0
Approach		407	4.9	0.135	2.5	NA	0.0	0.0	0.00	0.24	0.00	65.6
West: Wingham Road west												
11	T1	489	3.1	0.253	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	59	0.0	0.063	8.1	LOS A	0.2	1.7	0.45	0.68	0.45	54.7
Approach		548	2.7	0.253	0.9	NA	0.2	1.7	0.05	0.07	0.05	67.9
All Vehicles		1116	3.2	0.253	2.6	NA	1.0	7.0	0.10	0.23	0.10	64.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2018 PM Peak - Seagull]

Existing Tee Geometry
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kolodong Rd south												
1	L2	29	0.0	0.222	8.5	LOS A	0.9	6.3	0.61	0.83	0.61	52.1
3	R2	90	2.2	0.222	11.7	LOS A	0.9	6.3	0.61	0.83	0.61	51.9
Approach		119	1.7	0.222	10.9	LOS A	0.9	6.3	0.61	0.83	0.61	52.0
East: Wingham Road east												
4	L2	76	2.6	0.043	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.6
5	T1	468	4.3	0.248	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		544	4.0	0.248	0.9	NA	0.0	0.0	0.00	0.09	0.00	68.3
West: Wingham Road west												
11	T1	381	2.6	0.195	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	21	0.0	0.027	8.9	LOS A	0.1	0.7	0.51	0.70	0.51	54.0
Approach		402	2.5	0.195	0.5	NA	0.1	0.7	0.03	0.04	0.03	68.9
All Vehicles		1065	3.2	0.248	1.9	NA	0.9	6.3	0.08	0.15	0.08	66.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2018 AM Peak_Seagull + 100% Subdivision]

Existing Tee Geometry
 Site Category: (None)
 GiveWay / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	v/c	sec		veh	m				km/h
South: Kolodong Rd south												
1	L2	95	0.0	0.628	10.5	LOS A	5.9	41.1	0.70	1.04	1.23	50.0
3	R2	322	0.3	0.628	14.8	LOS B	5.9	41.1	0.70	1.04	1.23	49.9
Approach		417	0.2	0.628	13.8	LOS A	5.9	41.1	0.70	1.04	1.23	50.0
East: Wingham Road east												
4	L2	205	0.5	0.114	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	249	7.6	0.135	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	70.0
Approach		454	4.4	0.135	2.9	NA	0.0	0.0	0.00	0.27	0.00	64.9
West: Wingham Road west												
11	T1	489	3.1	0.252	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	76	0.0	0.085	8.4	LOS A	0.3	2.3	0.48	0.71	0.48	54.5
Approach		565	2.7	0.252	1.2	NA	0.3	2.3	0.06	0.10	0.06	67.4
All Vehicles		1436	2.5	0.628	5.4	NA	5.9	41.1	0.23	0.43	0.38	60.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2018 PM Peak - Seagull + 100% Subdivision]

Existing Tee Geometry
 Site Category: (None)
 GiveWay / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	v/c	sec		veh	m				km/h
South: Kolodong Rd south												
1	L2	46	0.0	0.440	10.9	LOS A	2.3	16.4	0.73	0.98	1.05	48.5
3	R2	143	1.4	0.440	17.8	LOS B	2.3	16.4	0.73	0.98	1.05	48.4
Approach		189	1.1	0.440	16.1	LOS B	2.3	16.4	0.73	0.98	1.05	48.4
East: Wingham Road east												
4	L2	295	0.7	0.164	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	468	4.3	0.248	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		763	2.9	0.248	2.5	NA	0.0	0.0	0.00	0.24	0.00	65.6
West: Wingham Road west												
11	T1	381	2.6	0.196	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	83	0.0	0.139	11.1	LOS A	0.5	3.6	0.62	0.86	0.62	52.4
Approach		464	2.2	0.196	2.0	NA	0.5	3.6	0.11	0.15	0.11	66.0
All Vehicles		1416	2.4	0.440	4.1	NA	2.3	16.4	0.13	0.31	0.18	62.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101v [Wingham Rd_Kolodong Rd Tee Intersection 2018 AM Peak - Rbt]

Single Lane Roundabout
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kolodong Rd south												
1	L2	36	0.0	0.155	6.2	LOS A	0.8	5.8	0.44	0.66	0.44	53.6
3	R2	125	0.8	0.155	9.4	LOS A	0.8	5.8	0.44	0.66	0.44	54.1
Approach		161	0.6	0.155	8.7	LOS A	0.8	5.8	0.44	0.66	0.44	54.0
East: Wingham Road east												
4	L2	158	0.6	0.132	6.2	LOS A	0.7	4.8	0.20	0.56	0.20	56.0
5	T1	249	7.6	0.188	6.0	LOS A	1.0	7.7	0.21	0.50	0.21	58.3
Approach		407	4.9	0.188	6.1	LOS A	1.0	7.7	0.20	0.52	0.20	57.4
West: Wingham Road west												
11	T1	489	3.1	0.384	6.5	LOS A	2.7	19.2	0.38	0.54	0.38	59.5
12	R2	59	0.0	0.080	10.2	LOS A	0.4	2.7	0.35	0.66	0.35	54.2
Approach		548	2.7	0.384	6.9	LOS A	2.7	19.2	0.38	0.55	0.38	58.9
All Vehicles		1116	3.2	0.384	6.9	LOS A	2.7	19.2	0.32	0.56	0.32	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101v [Wingham Rd_Kolodong Rd Tee Intersection 2018 PM Peak - Rbt]

Roundabout
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Kolodong Rd south												
1	L2	29	0.0	0.136	7.5	LOS A	0.7	5.1	0.57	0.73	0.57	52.7
3	R2	90	2.2	0.136	10.8	LOS A	0.7	5.1	0.57	0.73	0.57	53.2
Approach		119	1.7	0.136	10.0	LOS A	0.7	5.1	0.57	0.73	0.57	53.1
East: Wingham Road east												
4	L2	76	2.6	0.083	6.1	LOS A	0.4	2.8	0.12	0.56	0.12	56.3
5	T1	468	4.3	0.305	5.8	LOS A	1.9	13.9	0.12	0.50	0.12	59.7
Approach		544	4.0	0.305	5.9	LOS A	1.9	13.9	0.12	0.51	0.12	59.2
West: Wingham Road west												
11	T1	381	2.6	0.289	6.2	LOS A	1.9	13.6	0.30	0.51	0.30	60.0
12	R2	21	0.0	0.027	9.8	LOS A	0.1	0.9	0.29	0.63	0.29	54.4
Approach		402	2.5	0.289	6.4	LOS A	1.9	13.6	0.30	0.52	0.30	59.6
All Vehicles		1065	3.2	0.305	6.5	LOS A	1.9	13.9	0.24	0.54	0.24	58.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [Wingham Rd_Kolodong Rd Tee Intersection 2018 AM Peak - Rbt + 100% Subdivision]**

Single Lane Roundabout
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %				Vehicles	Distance				
		veh/h		v/c	sec		veh	m				km/h
South: Kolodong Rd south												
1	L2	95	0.0	0.396	6.6	LOS A	2.6	18.3	0.54	0.70	0.54	53.3
3	R2	322	0.3	0.396	9.8	LOS A	2.6	18.3	0.54	0.70	0.54	53.9
Approach		417	0.2	0.396	9.1	LOS A	2.6	18.3	0.54	0.70	0.54	53.7
East: Wingham Road east												
4	L2	205	0.5	0.166	6.2	LOS A	0.9	6.6	0.25	0.56	0.25	55.9
5	T1	249	7.6	0.195	6.1	LOS A	1.1	8.5	0.25	0.51	0.25	58.1
Approach		454	4.4	0.195	6.2	LOS A	1.1	8.5	0.25	0.53	0.25	57.1
West: Wingham Road west												
11	T1	489	3.1	0.485	8.1	LOS A	3.6	25.6	0.66	0.70	0.66	58.2
12	R2	76	0.0	0.131	12.4	LOS A	0.6	4.5	0.55	0.76	0.55	52.6
Approach		565	2.7	0.485	8.7	LOS A	3.6	25.6	0.64	0.71	0.64	57.4
All Vehicles		1436	2.5	0.485	8.0	LOS A	3.6	25.6	0.49	0.65	0.49	56.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101v [Wingham Rd_Kolodong Rd Tee Intersection 2018 PM Peak - Rbt + 100% Subdivision]

Roundabout
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %				Vehicles	Distance				
		veh/h	%	v/c	sec		veh	m				km/h
South: Kolodong Rd south												
1	L2	46	0.0	0.221	7.7	LOS A	1.3	9.0	0.62	0.76	0.62	52.6
3	R2	143	1.4	0.221	11.0	LOS A	1.3	9.0	0.62	0.76	0.62	53.1
Approach		189	1.1	0.221	10.2	LOS A	1.3	9.0	0.62	0.76	0.62	52.9
East: Wingham Road east												
4	L2	295	0.7	0.252	6.4	LOS A	1.5	10.4	0.28	0.56	0.28	55.8
5	T1	468	4.3	0.350	6.2	LOS A	2.3	16.9	0.29	0.51	0.29	58.8
Approach		763	2.9	0.350	6.3	LOS A	2.3	16.9	0.29	0.53	0.29	57.6
West: Wingham Road west												
11	T1	381	2.6	0.314	6.6	LOS A	2.1	14.9	0.40	0.55	0.40	59.5
12	R2	83	0.0	0.117	10.5	LOS A	0.6	4.1	0.40	0.67	0.40	54.0
Approach		464	2.2	0.314	7.3	LOS A	2.1	14.9	0.40	0.57	0.40	58.4
All Vehicles		1416	2.4	0.350	7.1	LOS A	2.3	16.9	0.37	0.58	0.37	57.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2028 AM Peak]

Existing Tee Geometry
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Kolodong Rd south												
1	L2	36	0.0	0.684	20.6	LOS B	3.9	27.7	0.86	1.16	1.70	38.2
3	R2	125	0.8	0.684	41.1	LOS C	3.9	27.7	0.86	1.16	1.70	38.1
Approach		161	0.6	0.684	36.5	LOS C	3.9	27.7	0.86	1.16	1.70	38.1
East: Wingham Road east												
4	L2	158	0.6	0.088	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	304	7.6	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	70.0
Approach		462	5.2	0.164	2.2	NA	0.0	0.0	0.00	0.21	0.00	66.1
West: Wingham Road west												
11	T1	597	3.0	0.308	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	59	0.0	0.067	8.4	LOS A	0.3	1.8	0.48	0.70	0.48	54.4
Approach		656	2.7	0.308	0.8	NA	0.3	1.8	0.04	0.06	0.04	68.2
All Vehicles		1279	3.4	0.684	5.8	NA	3.9	27.7	0.13	0.25	0.24	61.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2028 PM Peak]

Existing Tee Geometry
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Kolodong Rd south												
1	L2	29	0.0	0.561	18.1	LOS B	2.6	18.5	0.89	1.09	1.40	39.6
3	R2	90	2.2	0.561	37.7	LOS C	2.6	18.5	0.89	1.09	1.40	39.5
Approach		119	1.7	0.561	33.0	LOS C	2.6	18.5	0.89	1.09	1.40	39.6
East: Wingham Road east												
4	L2	76	2.6	0.043	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.6
5	T1	571	4.2	0.302	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		647	4.0	0.302	0.8	NA	0.0	0.0	0.00	0.07	0.00	68.5
West: Wingham Road west												
11	T1	465	2.6	0.238	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	21	0.0	0.031	9.8	LOS A	0.1	0.8	0.56	0.75	0.56	53.3
Approach		486	2.5	0.238	0.4	NA	0.1	0.8	0.02	0.03	0.02	69.0
All Vehicles		1252	3.2	0.561	3.7	NA	2.6	18.5	0.09	0.15	0.14	64.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2028 AM Peak + 100% Subdivision]

Existing Tee Geometry
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Kolodong Rd south												
1	L2	95	0.0	1.884	1608.6	LOS F	253.4	1777.2	1.00	11.52	37.64	2.2
3	R2	322	0.3	1.884	1622.3	LOS F	253.4	1777.2	1.00	11.52	37.64	2.2
Approach		417	0.2	1.884	1619.1	LOS F	253.4	1777.2	1.00	11.52	37.64	2.2
East: Wingham Road east												
4	L2	205	0.5	0.114	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	304	7.6	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	70.0
Approach		509	4.7	0.164	2.6	NA	0.0	0.0	0.00	0.25	0.00	65.4
West: Wingham Road west												
11	T1	597	3.0	0.307	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	76	0.0	0.091	8.8	LOS A	0.4	2.5	0.51	0.73	0.51	54.2
Approach		673	2.7	0.307	1.0	NA	0.4	2.5	0.06	0.08	0.06	67.7
All Vehicles		1599	2.7	1.884	423.5	NA	253.4	1777.2	0.28	3.12	9.84	7.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2028 PM Peak + 100% Subdivision]

Existing Tee Geometry
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Kolodong Rd south												
1	L2	46	0.0	1.174	372.0	LOS F	43.0	304.0	1.00	4.02	12.39	8.0
3	R2	143	1.4	1.174	398.1	LOS F	43.0	304.0	1.00	4.02	12.39	8.0
Approach		189	1.1	1.174	391.7	LOS F	43.0	304.0	1.00	4.02	12.39	8.0
East: Wingham Road east												
4	L2	295	0.7	0.164	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	567	3.5	0.299	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		862	2.6	0.299	2.2	NA	0.0	0.0	0.00	0.21	0.00	66.0
West: Wingham Road west												
11	T1	465	2.6	0.239	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	83	0.0	0.162	12.4	LOS A	0.6	4.1	0.68	0.88	0.68	51.4
Approach		548	2.2	0.239	1.9	NA	0.6	4.1	0.10	0.13	0.10	66.3
All Vehicles		1599	2.3	1.174	48.1	NA	43.0	304.0	0.15	0.63	1.50	35.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2028 AM Peak_Seagull + 100% Subdivision]

Existing Tee Geometry
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Kolodong Rd south												
1	L2	95	0.0	0.686	12.4	LOS A	6.8	47.5	0.76	1.15	1.52	48.4
3	R2	322	0.3	0.686	17.3	LOS B	6.8	47.5	0.76	1.15	1.52	48.3
Approach		417	0.2	0.686	16.2	LOS B	6.8	47.5	0.76	1.15	1.52	48.4
East: Wingham Road east												
4	L2	205	0.5	0.114	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	304	7.6	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	70.0
Approach		509	4.7	0.164	2.6	NA	0.0	0.0	0.00	0.25	0.00	65.4
West: Wingham Road west												
11	T1	597	3.0	0.307	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	76	0.0	0.091	8.8	LOS A	0.4	2.5	0.51	0.73	0.51	54.2
Approach		673	2.7	0.307	1.0	NA	0.4	2.5	0.06	0.08	0.06	67.7
All Vehicles		1599	2.7	0.686	5.5	NA	6.8	47.5	0.22	0.41	0.42	60.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wingham Rd_Kolodong Rd Tee Intersection 2028 PM Peak - Seagull + 100% Subdivision]

Existing Tee Geometry
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Kolodong Rd south												
1	L2	46	0.0	0.538	14.2	LOS A	2.9	20.7	0.82	1.07	1.31	45.6
3	R2	143	1.4	0.538	23.1	LOS B	2.9	20.7	0.82	1.07	1.31	45.5
Approach		189	1.1	0.538	20.9	LOS B	2.9	20.7	0.82	1.07	1.31	45.5
East: Wingham Road east												
4	L2	295	0.7	0.164	6.4	LOS A	0.0	0.0	0.00	0.61	0.00	59.7
5	T1	571	4.2	0.302	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		866	3.0	0.302	2.2	NA	0.0	0.0	0.00	0.21	0.00	66.0
West: Wingham Road west												
11	T1	465	2.6	0.239	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
12	R2	83	0.0	0.164	12.4	LOS A	0.6	4.2	0.69	0.88	0.69	51.4
Approach		548	2.2	0.239	1.9	NA	0.6	4.2	0.10	0.13	0.10	66.3
All Vehicles		1603	2.5	0.538	4.3	NA	2.9	20.7	0.13	0.28	0.19	62.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101v [Wingham Rd_Kolodong Rd Tee Intersection 2028 AM Peak - Rbt + 100% Subdivision]

Single Lane Roundabout
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %				Vehicles	Distance				
		veh/h	%	v/c	sec		veh	m				
South: Kolodong Rd south												
1	L2	95	0.0	0.420	7.1	LOS A	2.8	19.7	0.60	0.73	0.60	53.0
3	R2	322	0.3	0.420	10.3	LOS A	2.8	19.7	0.60	0.73	0.60	53.6
Approach		417	0.2	0.420	9.6	LOS A	2.8	19.7	0.60	0.73	0.60	53.5
East: Wingham Road east												
4	L2	205	0.5	0.173	6.3	LOS A	1.0	6.9	0.26	0.56	0.26	55.9
5	T1	304	7.6	0.235	6.1	LOS A	1.4	10.7	0.26	0.51	0.26	58.1
Approach		509	4.7	0.235	6.2	LOS A	1.4	10.7	0.26	0.53	0.26	57.2
West: Wingham Road west												
11	T1	597	3.0	0.587	8.8	LOS A	5.3	37.9	0.73	0.75	0.78	57.9
12	R2	76	0.0	0.131	12.4	LOS A	0.6	4.5	0.56	0.76	0.56	52.6
Approach		673	2.7	0.587	9.2	LOS A	5.3	37.9	0.71	0.75	0.75	57.2
All Vehicles		1599	2.7	0.587	8.4	LOS A	5.3	37.9	0.54	0.68	0.56	56.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101v [Wingham Rd_Kolodong Rd Tee Intersection 2028 PM Peak - Rbt + 100% Subdivision]

Roundabout
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Kolodong Rd south												
1	L2	46	0.0	0.242	8.6	LOS A	1.4	10.2	0.68	0.80	0.68	51.9
3	R2	143	1.4	0.242	11.9	LOS A	1.4	10.2	0.68	0.80	0.68	52.4
Approach		189	1.1	0.242	11.1	LOS A	1.4	10.2	0.68	0.80	0.68	52.3
East: Wingham Road east												
4	L2	295	0.7	0.266	6.4	LOS A	1.6	11.1	0.29	0.57	0.29	55.8
5	T1	571	4.2	0.422	6.2	LOS A	3.1	22.3	0.32	0.52	0.32	58.7
Approach		866	3.0	0.422	6.3	LOS A	3.1	22.3	0.31	0.53	0.31	57.7
West: Wingham Road west												
11	T1	465	2.6	0.380	6.6	LOS A	2.8	19.7	0.43	0.55	0.43	59.3
12	R2	83	0.0	0.117	10.5	LOS A	0.6	4.2	0.40	0.67	0.40	54.0
Approach		548	2.2	0.380	7.2	LOS A	2.8	19.7	0.43	0.57	0.43	58.4
All Vehicles		1603	2.5	0.422	7.2	LOS A	3.1	22.3	0.39	0.58	0.39	57.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

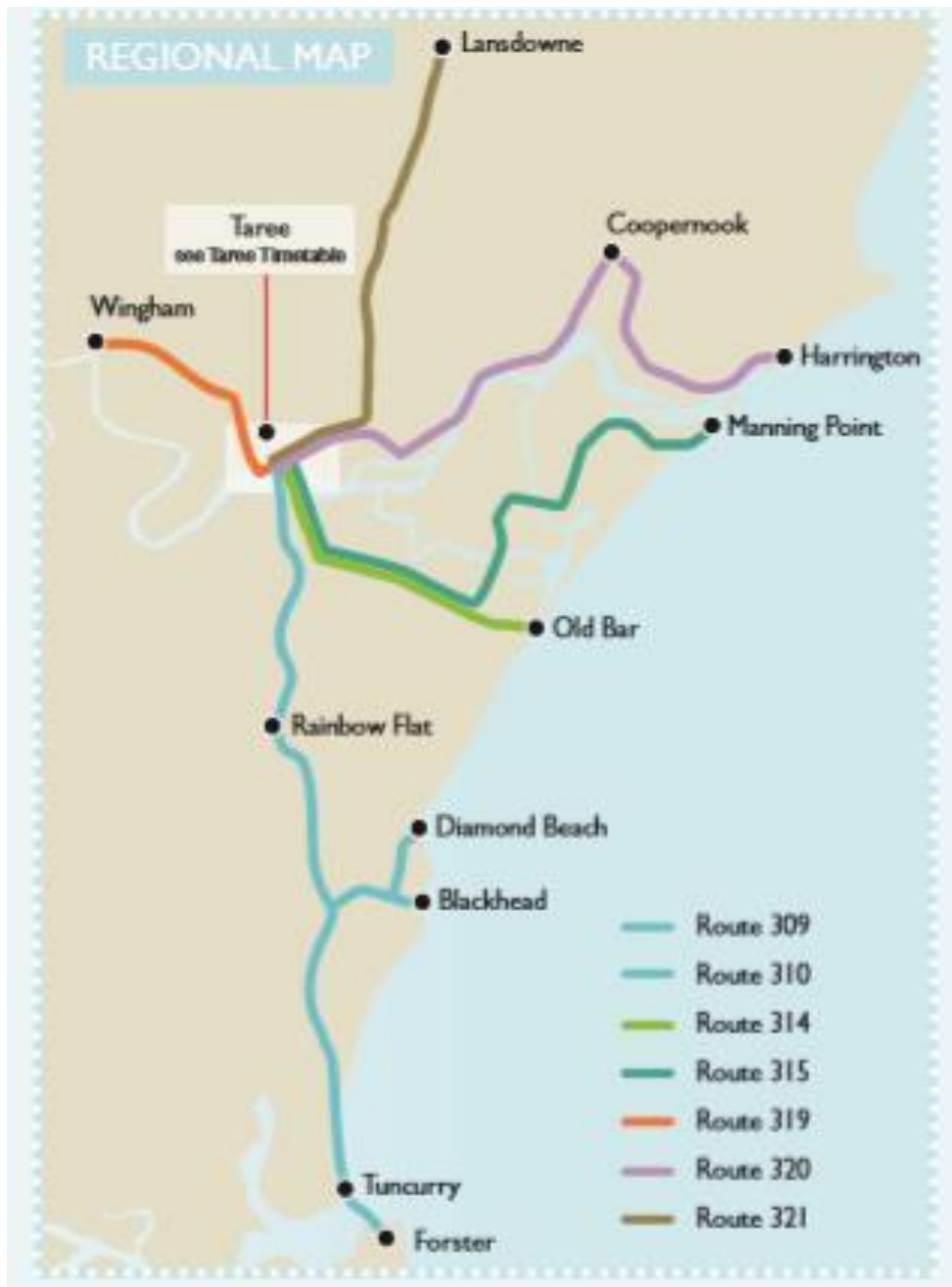
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

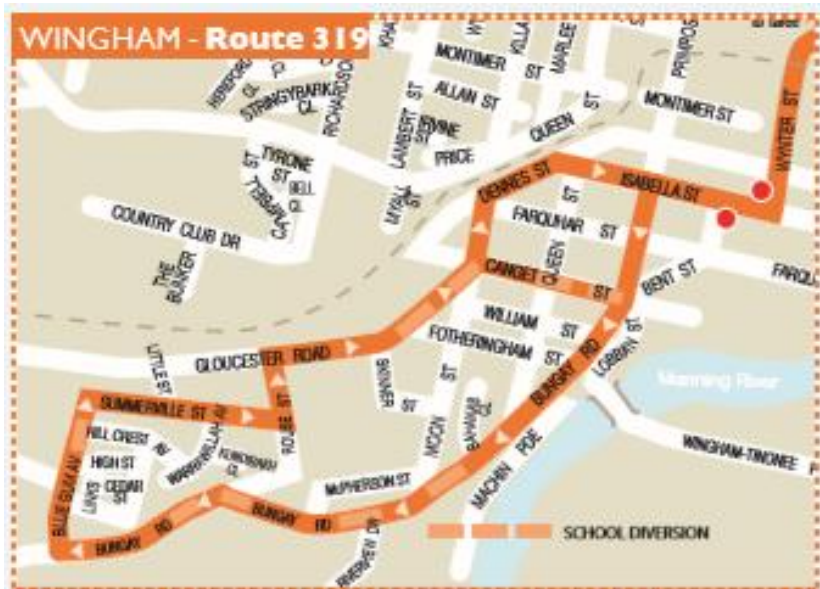
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX D

BUS ROUTE AND TIMETABLES





Taree to Wingham • ROUTE 319

SERVICE DAYS	MONDAY - FRIDAY				
ROUTE NUMBER	319 ♿	319 ♿	319 ♿	319 ♿	319 ♿
Manning Mall, Manning St	7.35am	9.10am	12.25pm	2.10pm	3.40pm (3.15pm)
Valley Fair, Victoria St	7.40am	9.15am	12.30pm	2.15pm	3.45pm (3.20pm)
Frances St after Spence St	-	-	12.35pm	-	-
Mayo Hospital, Wingham Rd	7.50am	9.25am	12.40pm	2.25pm	4.05pm (3.30pm)
Isabella St Bus Stop	7.55am	9.30am	12.45pm	2.30pm	4.10pm (3.35pm)

Wingham to Taree • ROUTE 319

SERVICE DAYS	MONDAY - FRIDAY				
ROUTE NUMBER	319 ♿	319 ♿	319 ♿	319 ♿	319 ♿
Isabella St Bus Stop	8.10am	9.55am	1.15pm	2.45pm	4.20pm (4.00pm)
Alma Place, Wingham Rd	8.15am	10.00am	1.20pm	2.50pm	4.25pm (4.05pm)
Frances St after Spence St	-	10.10am	-	-	-
Centerpoint Victoria St	8.30am	10.15am	1.32pm	3.00pm	4.35pm (4.15pm)
Manning Mall, Manning St	8.35am	10.20am	1.30pm	3.05pm	4.40pm (4.20pm)

No service weekends & public holidays
 () brackets indicate altered times for school holidays