Rameus December Nominees Pty Ltd and Cobandrah Pty Ltd

Lochiel Proposed Rural Residential Development Traffic Impact Assessment

Prepared by Sydney Traffic Engineers & Traffic Matters

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Contents

Figures

1 Introduction

1.1 Background

Sydney Traffic Engineers and Traffic Matters have been commissioned by Rameus December Nominees Pty Ltd and Cobandrah Pty Ltd for their respective proposed rezonings of land at Lochiel, from Zone RU2 Rural Landscape to Zone C4 Environmental Living. In particular, this report addresses the matters raised by Transport for New South Wales (TfNSW) with respect to two separate planning proposals, being for:

- Lot 5 DP 750207 and Lot 1 DP 130034 which is owned by Cobandrah Pty Ltd (see TfNSW letter dated 21 February 2024) (TfNSW Reference: STH24/00121/001; Council Reference: F12/281); and
- Part Lot 23 DP1292533, Mount Darragh Rd Lochiel which is owned by Rameus December Nominees Pty Ltd (see TfNSW letter dated 19 February 2024) (TfNSW Reference: STH24/00094/001; Council Reference F12/281).

A single report has been prepared in accordance with the approach agreed in discussions with TfNSW and the Bega Valley Shire Council (BVSC). The report provides assessments with respect to both planning proposals on an individual basis, as well as considering the cumulative impact of the two proposals as well as the impact of the potential future development of Area 3 of the Pambula Catchment in the Bega Valley Shire Council Rural Residential Strategy (BVSC RRS).

1.2 Purpose of this Report

This report provides an assessment of the two respective proposed rezonings and potential traffic impacts on Mt Darragh Road, including the intersection of Mt Darragh Road and the Princes Highway at South Pambula. The following matters have been considered in the development of this report.

- Existing traffic conditions on the surrounding road network.
- Suitability of the proposed access drive location.
- The traffic generating characteristics of the proposed rezoning and development.
- The transport impacts of the development proposal on the surrounding road network.
- Assessment of key intersections including Mt Darragh Road/Princes Highway
- Existing bus services and potential changes as a result of these Planning Proposals
- Assessment of the existing active transport network

1.3 References

In the preparation of this report the following has been carried out:

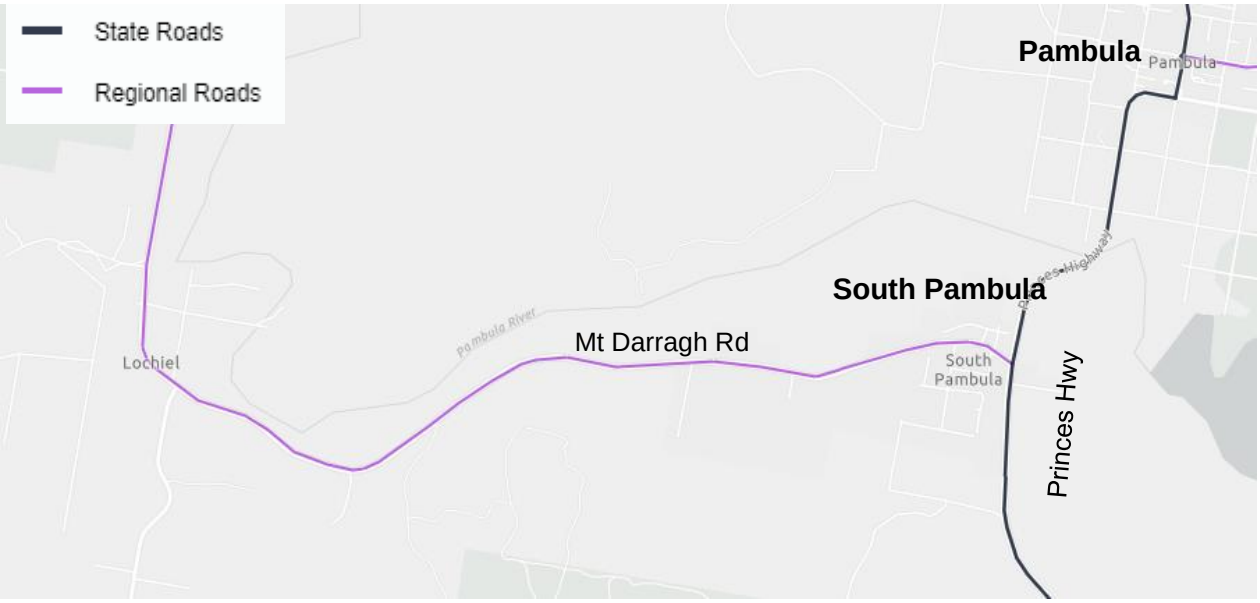
- A review of the surrounding road network.
- Traffic surveys of the Princes Highway/Mt Darragh Road intersection
- Review of the proposed rezoning plan for the development
- Australian Standards
- Guide to Traffic Generating Development Version 2.2
- Austroads Guide to Road Design Part 3 and Part 4A
- Austroads Guide to Traffic Management Part 12
- Other documents and information as included in this report.

2 Existing conditions

2.1 Road Hierarchy

The road network in the area is classified in accordance with the type of road and its function.

Figure 2-1 Road Classification



Source: Transport for NSW

2.1.1 Princes Highway (A1)

The Princes Highway is a state road which provides a major link between Sydney and Melbourne, linking a number of coastal towns and rural communities on the south coast of NSW. It provides an important commercial and tourist link for the south coast.

In the area of South Pambula it is generally configured as two lane rural highway with a right turn bay provided at the intersection with Mt Darragh Road. A speed limit of 80km/h applies through South Pambula.

2.1.2 Mount Darragh Road

Mount Darragh Road is a Regional Road (Main Road 91) under the care and control of Bega Valley Shire Council. Running generally east to west, it connects the Princes Highway at South Pambula to Wyndham and the Monaro Highway (State Highway 19) at Bombala. It is generally a two-lane rural road providing a single traffic lane in each direction. Surrounding land uses are generally rural, national park or state forest along its length, with a speed limit of 60 or 80km/h outside of communities such as South Pambula, Wyndham and Cathcart, where a 50km/h speed limit applies.

2.1.3 Back Creek Road

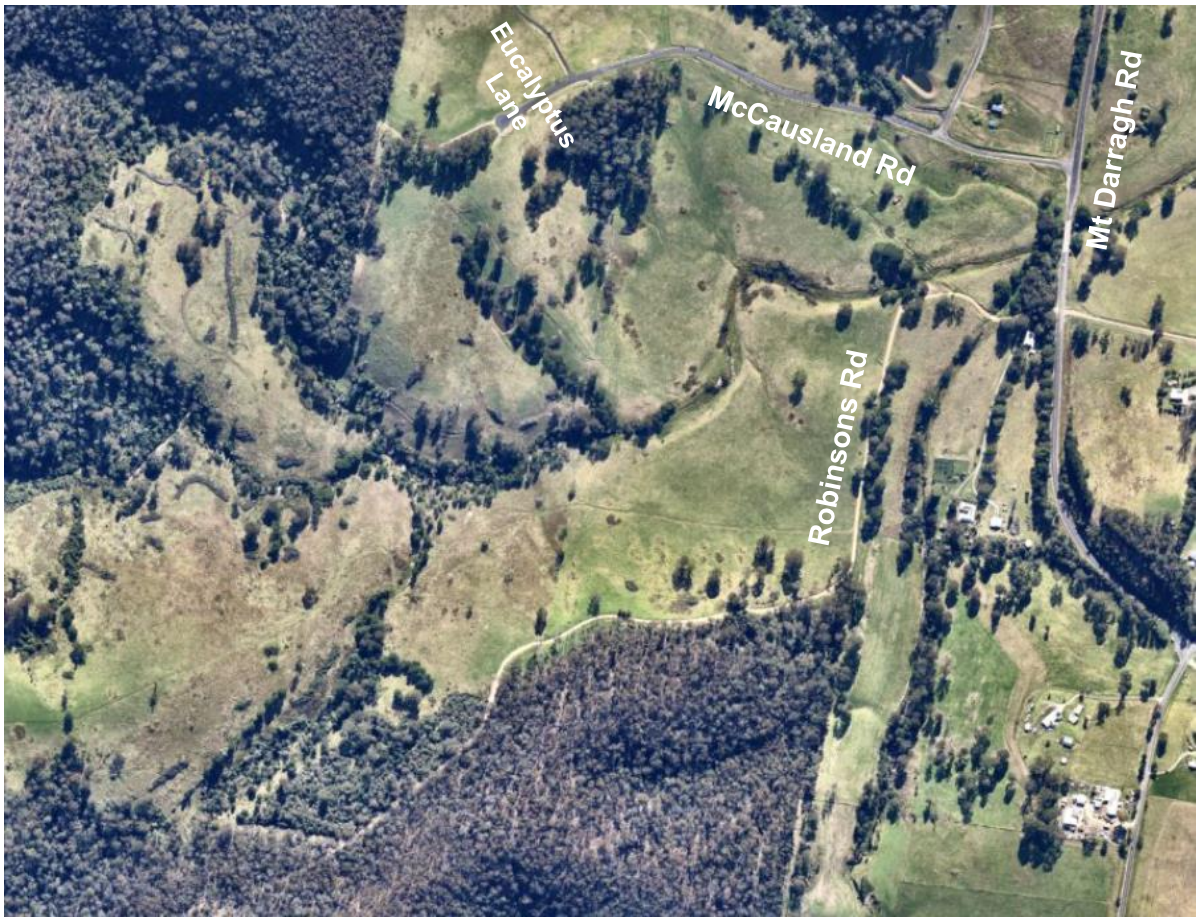
Back Creek Road is a local road which intersects with Mt Darragh Road approximately 750m south of the land subject to these planning proposals. It provides an alternative road

link between Lochiel and Eden, intersecting with Nethercote Road at Nethercote and continuing to Eden. It is a two-lane rural road providing a single traffic lane in each direction

2.1.4 McCausland Road

McCausland Road is a local road off Mt Darragh Road which services a number of existing rural residential properties on the western side. The proposed rezoning of land of Part Lot 23 is with respect to the land on the southern side of the road. McCausland Road is approximately 5.5m in width.

Figure 2-2 McCausland Road



Aerial source: Nearmap

2.1.5 Mallyon Close, Beattie Lane, Eucalyptus Lane

Are local roads providing access to residential properties to several properties off McCausland Rd. Beattie Lane and Eucalyptus Lane are private laneways.

Figure 2-3 Mallyon Close

Aerial source: Nearmap

2.1.6 Unnamed Road

This runs off Mt Darragh Rd on the eastern side, opposite the intersection of Robinsons Road. It is a formed council-owned road of approximately 210 metres, constructed following the consent granted by the BVSC with respect to development application DA2018.219. Further, a Crown Road reserve extends from the council road and runs adjacent to the Site along its southern boundary.

Figure 2-4 Unnamed Road

Aerial source: Nearmap

2.2 Existing Traffic Controls

The following traffic controls are in place on the road network at the present time:

- Give Way signs are provided on Mt Darragh Road at the intersection with the Princes Highway.
- All other intersections in the area surrounding the proposed development operate under the T-junction rule, where vehicles on the terminating road must give way to vehicles on the through road.

2.3 Princes Highway Plans

Transport for NSW has published the Southern Regional Transport Plan (2014) and the Princes Highway Upgrade Roadmap 2040, providing an outline of the future planning of transport and access, and future road works on the Princes Highway. In the area of South Pambula this is limited to safety improvements and more overtaking lanes on the highway from Cobargo to Broadwater in the medium term. The Roadmap does not provide any specific detail on where these safety improvements might occur.

In addition, information provided from Transport for NSW (February 2024) highlights that "*TfNSW has no current plans or funding to investigate, develop and deliver road infrastructure upgrades along the Princes Highway at its existing connection with Mount Darragh Road*."

2.4 Road Network

Traffic counts were undertaken at the intersection of Mt Darragh Road and the Princes Highway at South Pambula, to assess the existing peak period traffic movements at the intersection. These traffic counts were carried out on Thursday 12th September 2024.

The counts identified the AM peak hour as 8:15-9:15 and the PM peak hour as 3:15-4:15. The intersection traffic count diagrams are shown below for the total vehicles for the AM (Figure 2-5) and PM peak (Figure 2-6). Extrapolation of the survey data to provide an estimate of Average Daily Traffic (ADT) provided an estimated 2,290 vehicles per day. This compares with the last available Average Annual Daily Traffic (AADT) information from the TfNSW Traffic Volume Viewer for a station located on Mt Darragh Road west of the intersection with Redfern Street. Count data from this station for the last available year, 2019, provided an AADT of 1,885.

Figure 2-5 AM Peak Volumes

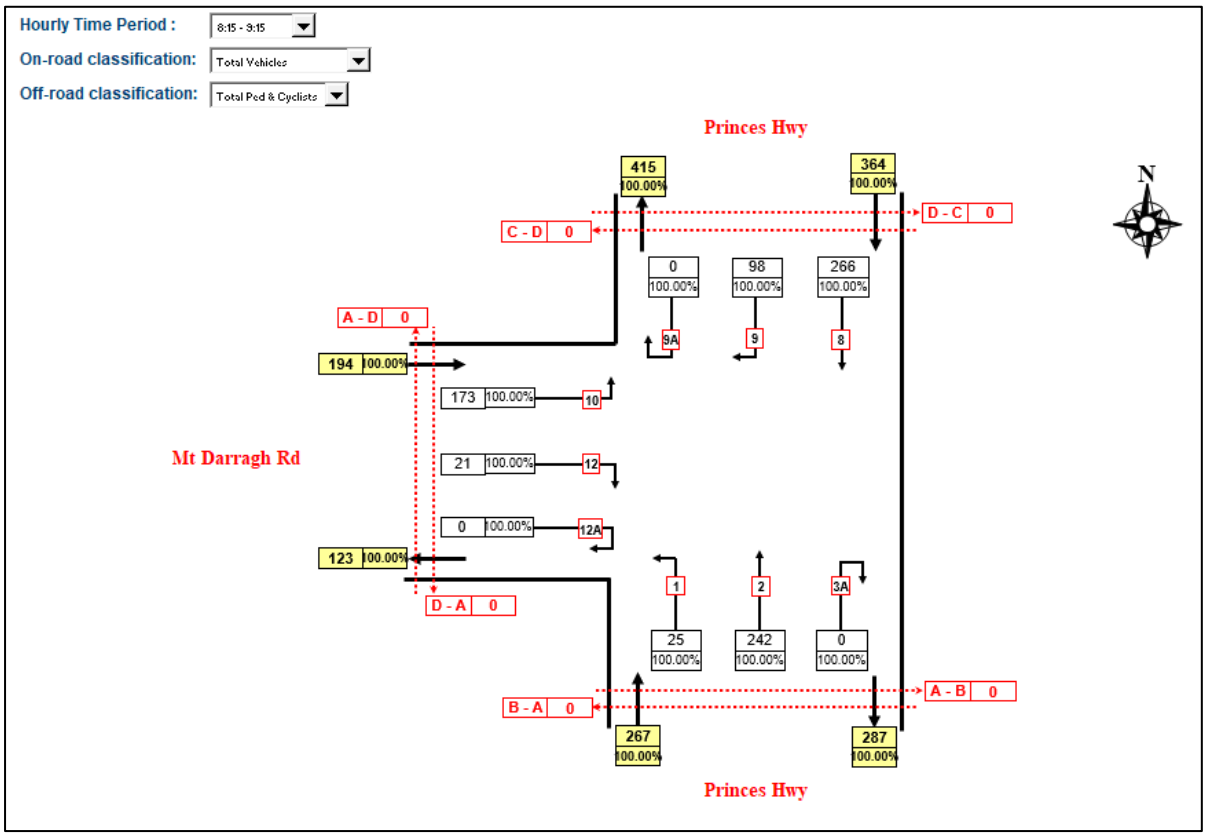
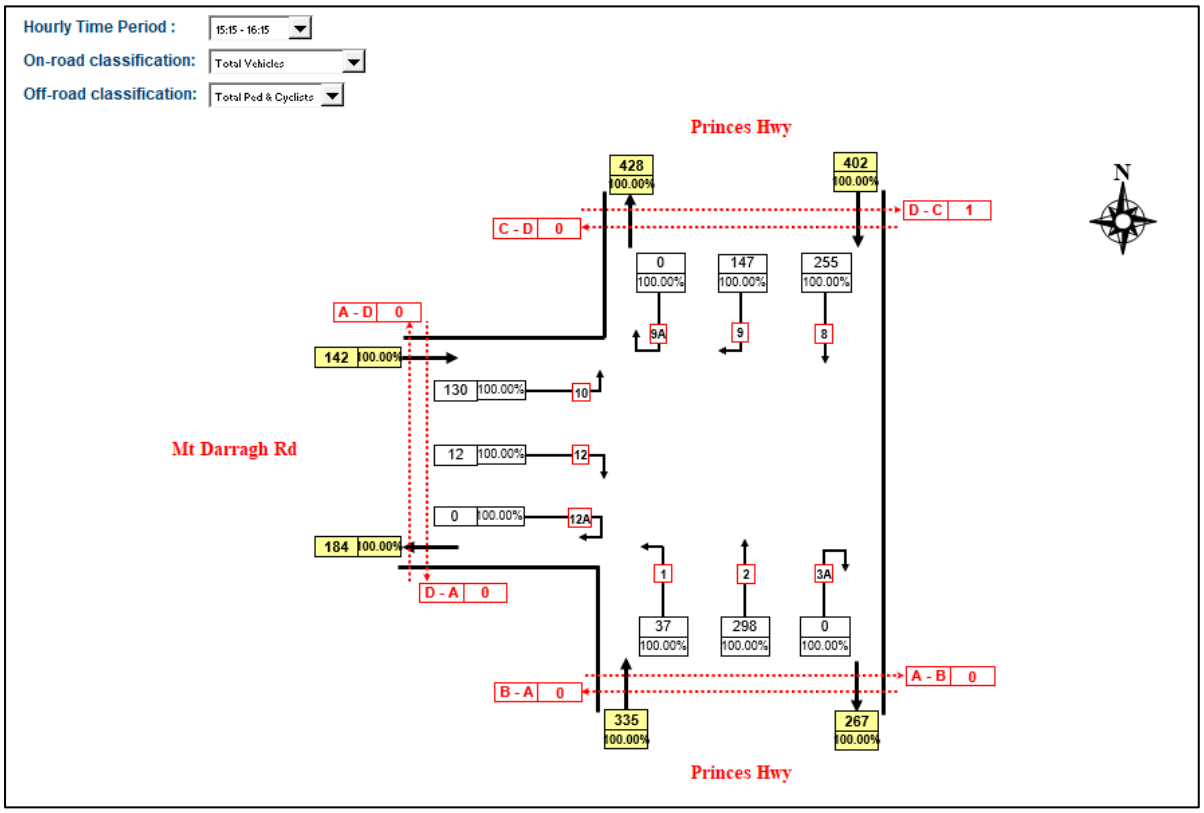


Figure 2-6 PM Peak Volumes



It is noted from the surveys that the peak traffic movements are the through movements on the Princes Highway, the right turn into Mt Darragh Road and the left turn out of Mt Darragh Road. The surveys also showed that the distribution of vehicles exiting Mt Darragh Road onto the Princes Highway was approximately 90% northbound and 10% southbound. For vehicles entering Mt Darragh Road from the Princes Highway the distribution of vehicles was approximately 80% from the north and 20% from the south.

2.5 Crash History

A review of the TfNSW crash data for the period 2019-2023 indicated that there had been three vehicle crashes in the section of Mt Darragh Road between McCausland Road and the intersection with the Princes Highway in that period.

There was a fatal head-on crash on Mt Darragh Road approx. 2.3km west of the Princes Highway intersection, a non-casualty single vehicle crash, just south of the intersection with McCausland Road and a moderate injury single vehicle crash at the intersection with the Princes Highway.

2.6 Public transport, pedestrians and cyclists

There are no public bus services which operate along Mt Darragh Road at Lochiel. There are school bus services operated by Sapphire Coast Buslines which pick up on Mt Darragh Road at McCausland Rd with two services in the morning and one in the afternoon.

The morning bus operations provide services to Pambula Public School (Bus Service S308) and to Lumen Christi Catholic College (LCCC), Eden Marine High School and Eden Public School (Bus Service S306). The S306 bus picks up students on the eastern side of Mt Darragh Road, opposite McCausland Road.

The afternoon bus service is a combination of three services (S319, S338, S340) from all of the abovementioned schools which drops students at the intersection of Mt Darragh Road and McCausland Road.

Site observations indicate that there is no hard stand area provided at either of the stops at McCausland Road, with the bus picking up and dropping off on the unsealed shoulder of Mt Darragh Road.

There are no sealed pedestrian paths or designated cycle lanes along Mt Darragh Road or the Princes Highway in Lochiel and South Pambula. A designated shoulder area of varying width is provided along the Princes Highway. The TfNSW Cycleway Finder identifies the road shoulder on the Princes Highway from north of the intersection with Mt Darragh Road to Pambula as a cycle suitable road shoulder.

2.6.1 Guidelines for Bus Capable Infrastructure

TfNSW had requested that detail be provided to support public transport, including school bus services and how the subject land can be serviced, in compliance with the TfNSW Guidelines for Bus Capable Infrastructure in Greenfield Sites. A review of these guidelines found that, in the most part, they are directed at the development of greenfield sites in urban areas and in the development of an appropriate road network to provide for bus services.

As indicated above, school bus services operate long Mt Darragh Road. The nature of these rural residential developments subject of this report would mean that bus services are unlikely to turn off Mt Darragh Road due to the small catchments involved, the distances that the bus must operate over and the additional time that would be involved in diverting off

Mt Darragh Road to service a relatively small number of passengers. Timing of buses is critical in managing transfers between services in order to service the various schools in Pambula and Eden. Additional time required for small diversions may mean that connections are missed, which may require the provision of additional buses to be operated.

As in most rural areas, buses would require a shoulder area to be able to pull off the traffic lane in order to pick up or set down. There is an existing shoulder area provided at McCausland Road which buses currently use.

2.7 Traffic Impacts

The traffic impacts have been assessed for the current traffic volumes for each of the planning proposals outlined in this report, and for a +10 year scenario with full development of Area 3 providing a total of 171 rural residential lots.

The future scenario identified that traffic growth occurs at an annual rate of approximately 1.6%. This has been assessed from information provided on the Transport for NSW Traffic Volume Viewer site for a station on Mt Darragh Road and one on the Princes Highway approximately 10km south of South Pambula.

There was no recent count data at either of the stations with the latest data being 2019 on Mt Darragh Road and 2013 for the Princes Highway station. However, the data provided for an estimate of the annual traffic growth. This annual traffic growth has been applied to estimate the peak hour traffic volumes at the intersection of the Princes Highway and Mt Darragh Road. The Area 3 development traffic has then been added to these estimated volumes.

In assessing the proposal for the rezoning, one of the major considerations is the potential impact that the additional traffic generated by the proposal will have on the existing road network and, most importantly, the intersections that will need to accommodate this additional traffic.

These impacts can be assessed through the modelling of the intersections. This modelling can provide outputs on the intersection Level of Service (LoS) and the Average Vehicle Delay (AVD) experienced by the traffic using the intersection. The TfNSW Guide to Traffic Generating Developments includes a Level of Service criterion which provides a recommended baseline for the assessment of intersection operations, taking in to account various intersection controls.

Table 2-1 Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic signals, roundabouts	Give Way and Stop signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Traffic modelling of the intersection of the Princes Highway and Mt Darragh Road has been carried out using SIDRA 9.1 modelling program. This program assesses the Level of Service (LoS), average delay and queue lengths for the intersection.

The assessment was carried out with the additional traffic that would be generated by the proposal, and the impact on current traffic volumes. This is considered appropriate as the traffic generated with full development of the proposal will not change in the future. Any future assessment would be including background traffic in the assessment, and not as a result of the proposal.

A turn warrant assessment for the intersection of Mt Darragh Road and the Princes Highway has also been carried out for each of the proposals, to identify if any additional works are required to meet the forecast increased traffic demand at this intersection. The results of this are outlined in Section 3.5.

3 Planning Proposal Lot 1/Lot 5

3.1 Lot 1 DP 130034 & Lot 5 DP 750207 (Part 299/300 Mt Darragh Road, Lochiel)

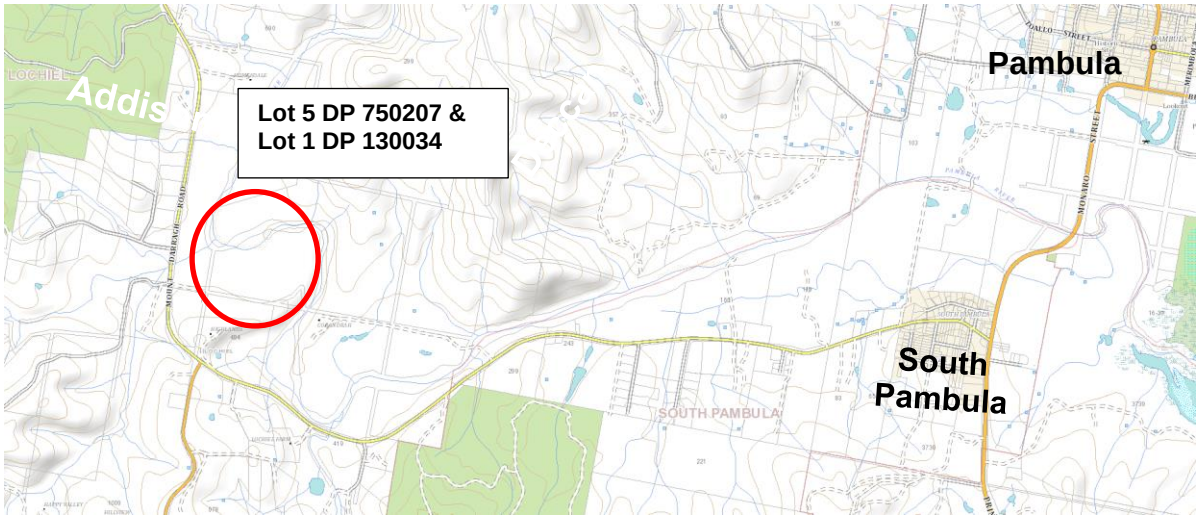
The site for this proposed rezoning is located on the eastern side of Mt Darragh Road approximately 5.5km west of the Princes Highway. It is open rural land at the present time, gently sloping towards the Pambula River located along the northern boundary.

The area surrounding the site is generally rural with the Pambula River forming the northern boundary of the site. The existing unnamed road off Mt Darragh Road, opposite the intersection of Mt Darragh Road and Robinsons Road, provides the only access to the site.

There is an existing rural residential development located to the north-west of the site on the western side of Mt Darragh Road.

The location of the site is shown in Figure 3-1.

Figure 3-1 Location Map

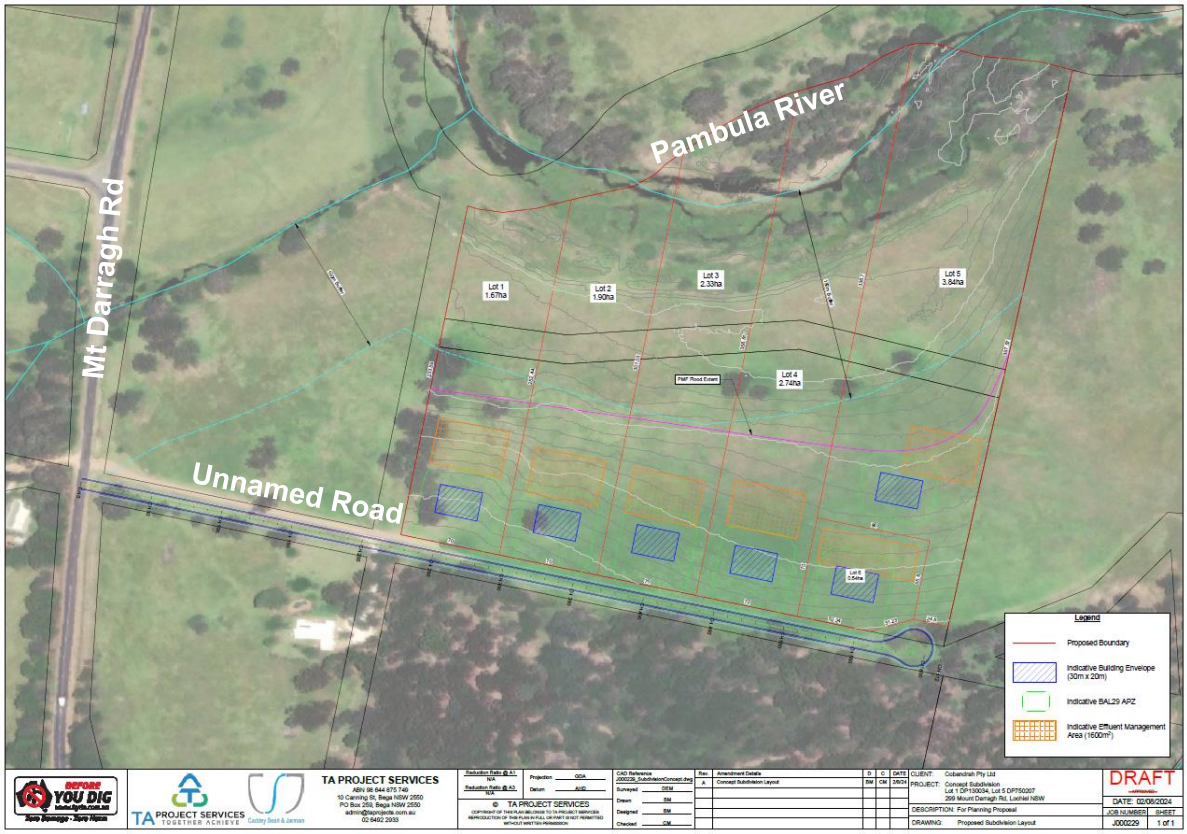


Source: SIX Maps

3.2 Rezoning Proposal

The rezoning proposal is seeking to enable the development of a six lot rural residential subdivision on the subject land. The site covers an area of approximately 12.9 ha and is located approximately 210 metres east of Mt Darragh Road. A layout plan for the proposed rezoning area is shown in Figure 3-2.

Figure 3-2 Proposed Development Layout - Lot 1 & Lot 5



3.3 Traffic generation

The traffic generation for the development of six rural residential lots has been calculated in accordance with the Guide to Traffic Generating Development (the Guide).

- Weekday average AM peak hour trips = 0.85 per dwelling
- Weekday average PM peak hour trips = 0.90 per dwelling
- Daily vehicle trips = 7.4 per dwelling

Based on the above traffic generation rates and the proposal for the development of six lots then the expected traffic generation for the development would be:

- AM Peak vehicle trips – 5 trips
- PM Peak vehicle trips – 5 trips
- Daily – 44 vehicle trips.

Sensitivity Test

Comments from Transport for NSW requested that traffic generation be also assessed on the basis that some of the proposed lots will end up with secondary dwellings. In order to assess the impact for each of the proposed rezoning sites, a sensitivity assessment has been carried out for second dwellings being developed on 30% of the lots. Using the same traffic generation rates per dwelling as shown above this has resulted in the following traffic generation.

30% with secondary dwellings

- AM Peak vehicle trips – 7 trips

- PM Peak vehicle trips – 7 trips
- Daily – 58 vehicle trips.

3.4 Traffic Distribution

The distribution of the traffic from the proposed rural residential lots has been assumed on the basis that most of the trip attractors during the peak, as a destination or origin, are located to the east of the proposed sites, schools, shops and employment zones located north and south along the Princes Highway. The distribution of traffic at the intersection of Mt Darragh Road and the Princes Highway has been derived from the traffic surveys that were carried out. The traffic distribution from the survey data has then been used to provide the distribution of the proposal on the surrounding road network on the following basis during the peak periods:

- AM peak – 80% outbound, 20% inbound.
- PM peak – 20% outbound, 80% inbound
- 90% of the traffic heading east toward South Pambula
- 10% heading west toward Wyndham
- 90% of eastbound traffic turning left at the Princes Highway
- 10% of eastbound traffic turning right at the Princes Highway
- 80% of traffic turning right from the Princes Highway into Mt Darragh Road
- 20% of traffic turning left from the Princes Highway into Mt Darragh Road.

3.4.1 Traffic Modelling

An assessment of the impacts of this additional traffic has been undertaken for the intersection of Mt Darragh Road and the Princes Highway. The intersection assessment was modelled using SIDRA 9.1, an intersection modelling program, to identify the impacts of the development of the site for the six lots proposed, and also to assess the impacts with 30% of the properties having a second dwelling located. The intersection was modelled for the existing traffic volumes, as identified from the traffic surveys, with the development of the six lots for rural residential, and with 30% of the lots also having a second dwelling.

The results from the SIDRA assessment identified that the proposed development would little to no impact on the Degree of Saturation, Average Delay for the intersection and the Level of Service. The results of the assessment are shown in Table 3-1, providing a comparison for total volume of traffic at the intersection, Degree of Saturation (DoS), Average Delay and Level of Service (LoS). Full Results are Provided in Appendix A.

Table 3-1 Intersection Assessment

AM	Volume	DoS	Av. Delay (sec)	LoS
Existing	868	0.154	2.5	A
+ Development	874	0.154	2.6	A
+30% 2nd dwelling	878	0.155	2.6	A
PM				
Existing	925	0.189	2.8	A
+ Development	931	0.190	2.8	A
+30% 2nd dwelling	933	0.190	2.8	A

It is considered that the traffic generation from the proposed development is acceptable for the surrounding road network.

3.5 Turn Assessment

A turn assessment was carried out for the intersection of Mt Darragh Road and the Princes Highway, in accordance with the Austroads Guide to Traffic Management Part 6: Figure 3.25, for the left turn movement from The Princes Highway into Mt Darragh Road. This was not carried out for the right turn movements as there is an existing 80m long right turn bay provided for vehicles turning right from the Princes Highway into Mt Darragh Road.

Reference to Table 3.25 of the Guide indicates that the existing through volume and left turning volume, without the proposal, meets the warrant for the provision of a short Left Turn Auxiliary Lane at the intersection. This identified that, with the development, turning volumes are no greater than the existing turning volumes and no additional delay is caused to northbound traffic.

3.6 Sight Distance

A sight distance assessment of the intersection where the Unnamed Road intersects with Mt Darragh Road indicated that, for the 80km/h speed limit in place on Mt Darragh Road and a reaction time of 2 seconds, that the following was required:

- Stopping Sight Distance (SSD) – 118m
- Safe Intersection Sight Distance (SISD) – 190m

The initial assessment is that for vehicles exiting the Unnamed Road there is approximately 206m sight distance to the south and >400m to the north, along Mt Darragh Road.

The intersection of the Unnamed Road with Mt Darragh Road will need to be upgraded at the development stage to provide a sealed road at the intersection that allows for two-way traffic flow. As the Robinsons Road intersection with Mt Darragh Road is located opposite the Unnamed Road intersection it will require the provision of Give Way or Stop signs with any development and upgrade of the access.

4 Planning Proposal – Part Lot 23

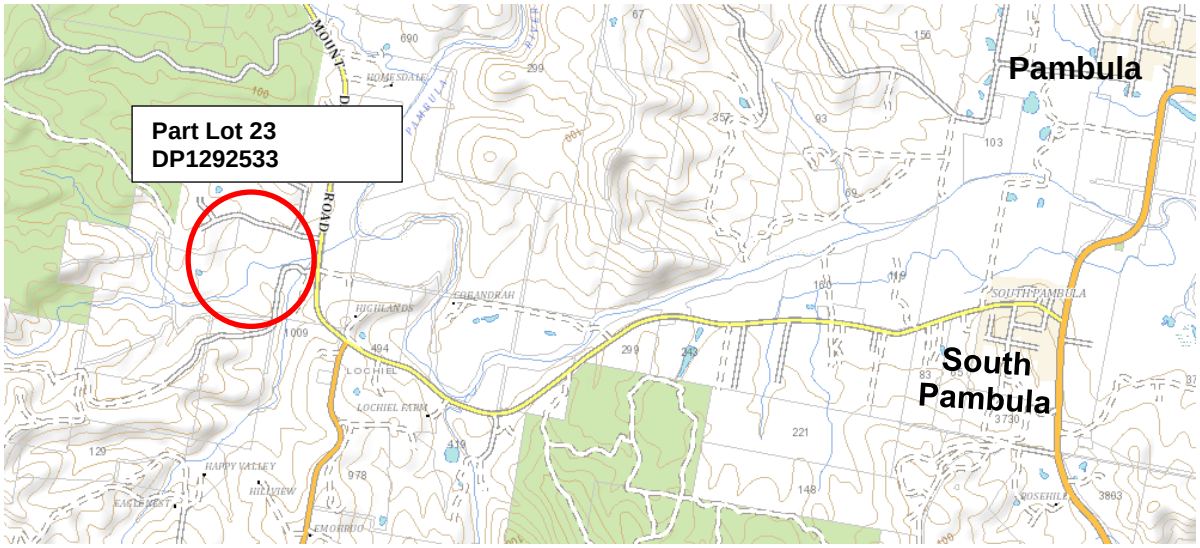
4.1 Part Lot 23 DP 1292533 (Part 299/300 Mt Darragh Road, Lochiel)

The site for this proposed rezoning is on the western side of Mt Darragh Road and the southern side of McCausland Road. The site is part of a large lot and is predominantly cleared rural land bordered by McCausland Road on the northern side and Burtons Creek on the southern side. The eastern boundary is Mt Darragh Road.

There is a small rural residential development on the northern side of McCausland Road and the site approaches Burtons Creek on the southern side. The area south of Burtons Creek is rural land.

The location of the site with respect to Pambula and South Pambula is shown in Figure 4-1.

Figure 4-1 Location Map



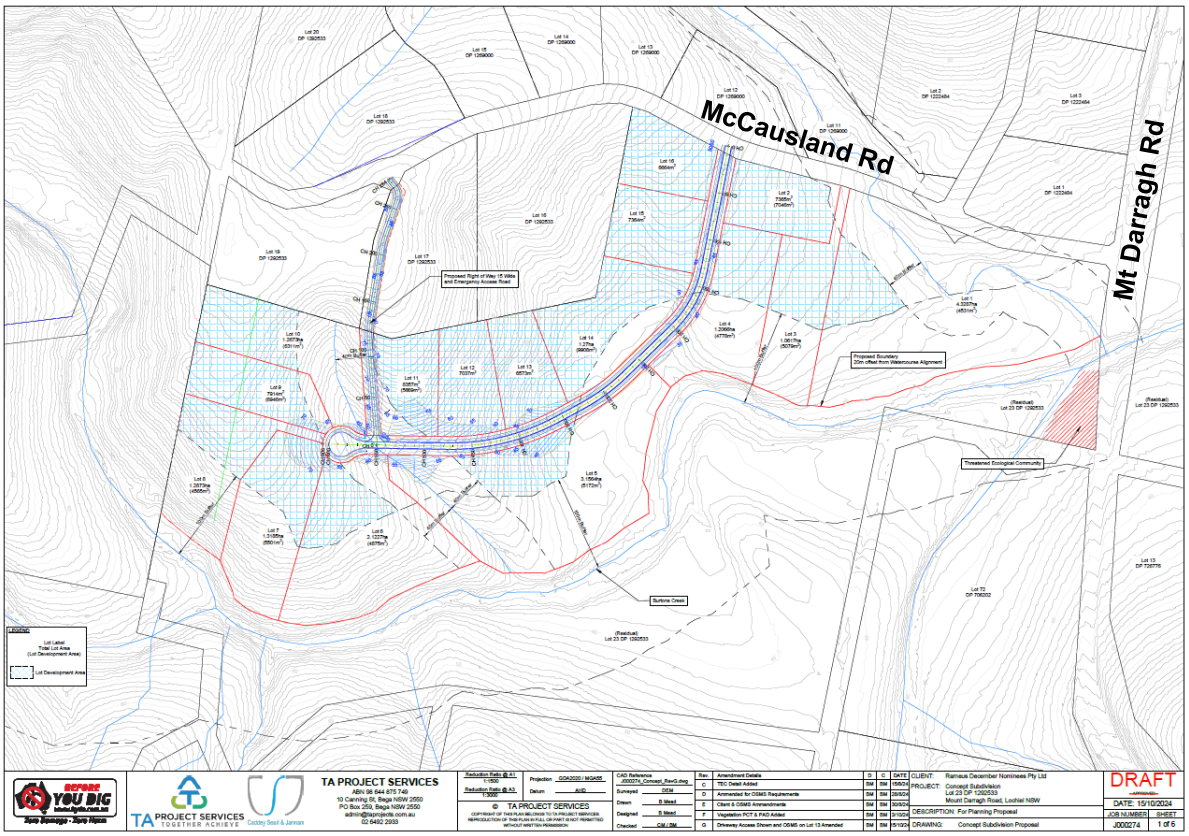
4.2 Rezoning Proposal

Part Lot 23 DP 1292533 (Part 299/300 Mt Darragh Road, Lochiel)

The rezoning proposal for this area of land is seeking to enable the development of 16 rural residential lots on an area of land of approximately 27 ha on the land bounded by Mt Darragh Road in the east, McCausland Road in the north, Burtons Creek to the south and an existing rural lot to the west.

A new access road is proposed off McCausland Road, approximately 400m west of the intersection with Mt Darragh Road. A layout plan for the proposed rezoning area is shown in Figure 4-2.

Figure 4-2 Proposed development layout – Pt Part Lot 23



4.3 Traffic Generation

The traffic generation for the development of 16 rural residential lots has been calculated in accordance with the Guide.

- Weekday average AM peak hour trips = 0.85 per dwelling
- Weekday average PM peak hour trips = 0.90 per dwelling
- Daily vehicle trips = 7.4 per dwelling

Based on the above traffic generation rates and the proposal for the development of 16 lots then the expected traffic generation for the development would be:

- AM Peak vehicle trips – 14 trips
- PM Peak vehicle trips – 14 trips
- Daily – 126 vehicle trips.

Sensitivity Test

Comments from Transport for NSW requested that traffic generation be also assessed on the basis that some of the proposed lots will end up with secondary dwellings. In order to assess the impact for each of the proposed rezoning sites, a sensitivity assessment has been carried out for second dwellings being developed on 30% of the lots. Using the same traffic generation rates per dwelling as shown above this has resulted in the following traffic generation.

30% with secondary dwellings

- AM Peak vehicle trips – 18 trips

- PM Peak vehicle trips – 19 trips
- Daily – 154 vehicle trips.

4.4 Traffic Distribution

The distribution of the traffic from the proposed rural residential lots has been assumed on the basis that most of the trip attractors during the peak, as a destination or origin, are located to the east of the proposed sites, schools, shops and employment zones located north and south along the Princes Highway. The distribution of traffic at the intersection of Mt Darragh Road and the Princes Highway has been derived from the traffic surveys that were carried out.

It is understood that some residents from the proposal may use Back Creek Road to access Eden however, no reduction has been made for the additional generated traffic.

The traffic distribution from the survey data has then been used to provide the distribution of the proposal on the surrounding road network on the following basis during the peak periods:

- AM peak – 80% outbound, 20% inbound.
- PM peak – 20% outbound, 80% inbound
- 90% of the traffic heading east toward South Pambula
- 10% heading west toward Wyndham
- 90% of eastbound traffic turning left at the Princes Highway
- 10% of eastbound traffic turning right at the Princes Highway
- 80% of traffic turning right from the Princes Highway into Mt Darragh Road
- 20% of traffic turning left from the Princes Highway into Mt Darragh Road.

4.4.1 Traffic Modelling

Traffic modelling of the intersection of the Princes Highway and Mt Darragh Road has been carried out using SIDRA 9.1 an intersection modelling program, to identify the impacts of the development of the site for the sixteen lots proposed, and also to assess the impacts with 30% of the properties having a second dwelling in place. SIDRA assesses the Level of Service (LoS), average delay and queue lengths for the intersection.

The traffic distribution for the development, as outlined above, of the 16 rural residential lots on the land would result in an increase of 14 vehicle trips to and from the east toward the intersection with the Princes Highway during peak hours and 1-2 vehicle to the west along Mt Darragh Road.

The assessment was carried out with the additional traffic that would be generated by the proposal, and the impact on current traffic volumes. This is considered appropriate as the traffic generated with full development of the proposal will not change. Any future assessment would be including background traffic in the assessment, and not as a result of the proposal.

Modelling of the existing intersection of the Princes Highway and Mt Darragh Road shows that the intersection currently operates at LoS ‘A’ in both peak periods, with minimal delays for all approaches and turning movements.

The results from the SIDRA assessment identified that the proposed development would have little to no impact on the Degree of Saturation, Average Delay for the intersection and the Level of Service. The results of the assessment are shown in Table 4-1, providing a comparison for total volume of traffic at the intersection, Degree of Saturation (DoS), Average Delay and Level of Service (LoS). Full Results are Provided in Appendix A.

Table 4-1 Intersection Assessment

AM	Volume	DoS	Av. Delay (sec)	LoS
Existing	868	0.154	2.5	A
+ Development	881	0.154	2.6	A
+30% 2nd dwelling	885	0.155	2.6	A
PM				
Existing	925	0.189	2.8	A
+ Development	938	0.191	2.9	A
+30% 2nd dwelling	953	0.191	2.9	A

As highlighted in the table above, the traffic generated by proposed rezoning site has little impact on the operation of the intersection, with LoS 'A' in both AM and PM peak hours.

4.5 Turn Assessment

A turn assessment was carried out for the intersection of Mt Darragh Road and the Princes Highway, in accordance with the Austroads Guide to Traffic Management Part 6: Figure 3.25 for the left turn movement from the Princes Highway into Mt Darragh Road. This was not carried out for the right turn movements, as there is an existing 80m long right turn bay provided for vehicles turning right from the Princes Highway into Mt Darragh Road.

Reference to Table 3.25 of the Guide indicates that the existing through volume and left turning volume meets the warrant for the provision of a short Left Turn Auxiliary Lane at the intersection. The forecast traffic volumes during the PM peak would meet the warrant however, the intersection modelling for the intersection indicates that the intersection would operate satisfactorily without the left turn lane, with no delay for northbound through traffic.

4.6 Sight Distance

A sight distance assessment of the intersection where McCausland Road intersects with Mt Darragh Road indicated that, for the 80km/h speed limit in place on Mt Darragh Road and a reaction time of 2 seconds, that the following was required:

- Stopping Sight Distance (SSD) – 118m
- Safe Intersection Sight Distance (SISD) – 190m

The initial assessment is that for vehicles exiting McCausland Road there is approximately 221m sight distance to the north and >400m to the south, along Mt Darragh Road. It is noted that McCausland Road is an existing road serving a number of properties and there is no existing crash history involving vehicles turning into, or out of, McCausland Road.

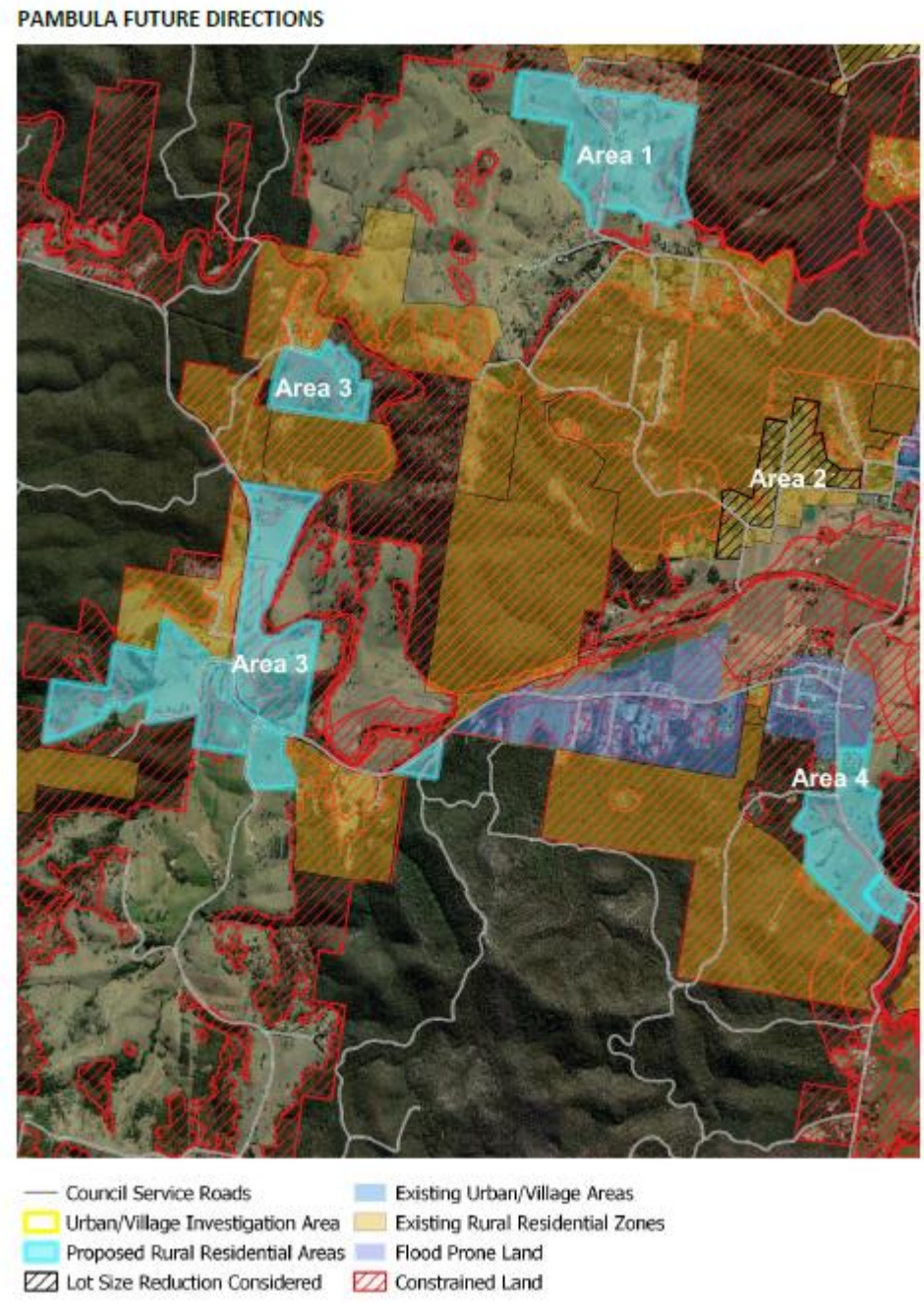
The current configuration of the intersection of McCausland Road and Mt Darragh Road is considered suitable for local street in a rural area servicing rural residential properties.

5 Area 3 Cumulative Impact

The potential impact for the full development of Area 3 of the Pambula Catchment identified in the Bega Valley Shire Council (BVSC) Rural Residential Land Strategy (RRS): BVSC 2020, has been assessed as well, in order to identify if any additional measures are required with the development of the area. Figure 5-1 provides an outline of the Area 3 lands identified.

Discussions with BVSC provided an agreement that the theoretical yield for Area 3 would be 171 lots.

Figure 5-1 Pambula Catchment



Source: BVSC Rural Residential Strategy 2020

5.1 Area 3 Traffic Generation

The traffic generation for the development of 171 rural residential lots has been calculated in accordance with the Guide.

- Weekday average AM peak hour trips = 0.85 per dwelling
- Weekday average PM peak hour trips = 0.90 per dwelling
- Daily vehicle trips = 7.4 per dwelling

Based on the above traffic generation rates and the proposal for the development of 171 lots then the expected traffic generation for the development would be:

- AM Peak vehicle trips – 145 trips
- PM Peak vehicle trips – 154 trips
- Daily – 1265 vehicle trips.

Sensitivity Test

Comments from Transport for NSW requested that traffic generation be also assessed on the basis that some of the proposed lots will end up with secondary dwellings. In order to assess the impact for each of the proposed rezoning sites, a sensitivity assessment has been carried out for second dwellings being developed on 30% of the lots. Using the same traffic generation rates per dwelling as shown above this has resulted in the following traffic generation.

30% with secondary dwellings

- AM Peak vehicle trips – 189 trips
- PM Peak vehicle trips – 200 trips
- Daily – 1645 vehicle trips.

5.2 Traffic Impact

Traffic modelling of the intersection of the Princes Highway and Mt Darragh Road has been carried out using SIDRA 9.1 modelling program.

An assessment of the impacts of this additional traffic has been undertaken for the intersection of Mt Darragh Road and the Princes Highway. The intersection assessment was modelled using SIDRA 9.1, an intersection modelling program, to identify the impacts of the development of the site for the 171 lots, and also to assess the impacts with 30% of the properties having a second dwelling located. SIDRA assesses the Level of Service (LoS), average delay and queue lengths for the intersection.

For this scenario, the intersection was modelled for the +10 year future traffic volumes without development, with the development of the 171 lots for rural residential, and with 30% of the lots also having a second dwelling.

The results from the SIDRA assessment identified that the proposed development would have little to minimal impact on the Degree of Saturation, Average Delay for the intersection and the Level of Service over the base traffic volume forecast for the +10 year scenario. The results of the assessment are shown in Table 5-1, providing a comparison for total volume of traffic at the intersection, Degree of Saturation (DoS), Average Delay and Level of Service (LoS). Full Results are Provided in Appendix A.

Table 5-1 Intersection Assessment

AM	Volume	DoS	Av. Delay (sec)	LoS	Comments
+10 years, no dev.	1009	0.179	2.7	A	
+ Development	1147	0.257	3.2	A	
+30% 2nd dwelling	1188	0.281	3.3	A	
PM					
+10 years, no dev.	1075	0.220	2.9	A	Mt Darragh Rd RT – LoS 'B'
+ Development	1222	0.251	3.7	A	Mt Darragh Rd RT – LoS 'B'
+30% 2nd dwelling	1268	0.281	3.9	A	Mt Darragh Rd RT – LoS 'B'

The intersection modelling shows that the intersection will operate satisfactorily in the future with minimal delay and most legs operating at LoS 'A' in both the AM and PM peak. The only movement which does not operate at this level is the right turn from Mt Darragh Road in the PM peak. This movement operates at LoS 'B' in the PM peak, even with no development in place.

5.3 Turn Assessment

A turn assessment was carried out for the intersection of Mt Darragh Road and the Princes Highway in accordance with the Austroads Guide to Traffic Management Part 6: Figure 3.25 for the left run movement from The Princes Highway into Mt Darragh Road, as there is an existing 80m long right turn bay provided for vehicles turning right from the Princes Highway into Mt Darragh Road.

Reference to Table 3.25 of the Guide indicates that the +10 years forecast through volume and left turning volume meets the warrant for the provision of a short Left Turn Auxiliary Lane at the intersection.

The forecast traffic volumes during the AM and PM peaks with the development of Area 3 would meet the warrant however, the intersection modelling for the intersection indicates that the intersection would operate satisfactorily without the left turn lane, with no delay for northbound through traffic.

6 Conclusion

This report has reviewed the planning proposals for two parcels of land at Lochiel, one proposal for six rural residential lots being located south of the Pambula River on the eastern side of Mt Darragh Road and the other, for 16 rural residential lots located on the southern side of McCausland Road.

A review of the potential future traffic impacts for the full development of the identified Pambula Catchment Area 3 as outlined in the Bega Valle Shire Council's Rural Residential Land Strategy. This would provide a total 171 rural residential lots. Each of these proposals was also assessed for 30% of proposed lots including a second dwelling on the lot.

The proposed rural residential rezoning of each of the two parcels of land examined in this report is expected to have minimal impact on the traffic volumes along Mt Darragh Road and at the intersections of Mt Darragh Road and the Princes Highway at South Pambula. It was also identified that sight distance for traffic entering Mt Darragh Road from the proposals would have sufficient sight distance to oncoming traffic.

The future assessment for +10 years was carried out for the full development of Area 3 as well. This identified that the background traffic growth for Mt Darragh Road and the Princes Highway intersection would not have any significant reduction in level of service or average delay with the current intersection configuration and additional traffic generated from Area 3 development.

Appendix A SIDRA Results

MOVEMENT SUMMARY

▽ Site: 101 [AM Peak Princes/Mt Darragh South Pambula (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	26	60.0	26	60.0	0.154	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	54.0
2	T1	All MCs	255	3.7	255	3.7	0.154	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	79.4
Approach			281	9.0	281	9.0	0.154	0.8	NA	0.0	0.0	0.00	0.06	0.00	76.1
North: Princes Highway															
8	T1	All MCs	280	7.5	280	7.5	0.151	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	103	16.3	103	16.3	0.084	6.9	LOS A	0.4	3.0	0.40	0.61	0.40	51.0
Approach			383	9.9	383	9.9	0.151	1.9	NA	0.4	3.0	0.11	0.16	0.11	57.2
West: Mt Darragh Road															
10	L2	All MCs	182	4.0	182	4.0	0.144	5.6	LOS A	0.6	4.4	0.36	0.58	0.36	51.6
12	R2	All MCs	22	9.5	22	9.5	0.048	10.6	LOS A	0.2	1.3	0.59	0.77	0.59	47.3
Approach			204	4.6	204	4.6	0.144	6.1	LOS A	0.6	4.4	0.38	0.60	0.38	51.1
All Vehicles			868	8.3	868	8.3	0.154	2.5	NA	0.6	4.4	0.14	0.23	0.14	60.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ Site: 101 [PM Peak Princes/Mt Darragh South Pambula (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	39	27.0	39	27.0	0.189	7.5	LOS A	0.0	0.0	0.00	0.07	0.00	62.7
2	T1	All MCs	314	3.4	314	3.4	0.189	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	78.9
Approach			353	6.0	353	6.0	0.189	0.9	NA	0.0	0.0	0.00	0.07	0.00	76.7
North: Princes Highway															
8	T1	All MCs	268	4.3	268	4.3	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	All MCs	155	6.8	155	6.8	0.128	8.4	LOS A	0.6	4.3	0.45	0.68	0.45	52.2
Approach			423	5.2	423	5.2	0.141	3.1	NA	0.6	4.3	0.17	0.25	0.17	66.9
West: Mt Darragh Road															
10	L2	All MCs	137	7.7	137	7.7	0.118	5.9	LOS A	0.5	3.6	0.40	0.60	0.40	50.7
12	R2	All MCs	13	16.7	13	16.7	0.035	12.9	LOS A	0.1	0.9	0.66	0.81	0.66	44.7
Approach			149	8.5	149	8.5	0.118	6.5	LOS A	0.5	3.6	0.42	0.62	0.42	50.2
All Vehicles			925	6.0	925	6.0	0.189	2.8	NA	0.6	4.3	0.14	0.24	0.14	66.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Lot 1 DP 130034 & Lot 5 DP 750207

299 Mt Darragh Road

MOVEMENT SUMMARY

▽ **Site: 101 [AM Peak w/ dev Princes/Mt Darragh South Pambula (Site Folder: Lot 1 & Lot 5 With Dev)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

With Development
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	26	60.0	26	60.0	0.154	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	54.0
2	T1	All MCs	255	3.7	255	3.7	0.154	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	79.4
Approach			281	9.0	281	9.0	0.154	0.8	NA	0.0	0.0	0.00	0.06	0.00	76.1
North: Princes Highway															
8	T1	All MCs	280	7.5	280	7.5	0.151	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	104	16.3	104	16.3	0.085	6.9	LOS A	0.4	3.0	0.40	0.61	0.40	51.0
Approach			384	9.9	384	9.9	0.151	1.9	NA	0.4	3.0	0.11	0.17	0.11	57.2
West: Mt Darragh Road															
10	L2	All MCs	185	4.0	185	4.0	0.147	5.6	LOS A	0.6	4.5	0.36	0.58	0.36	51.6
12	R2	All MCs	23	9.5	23	9.5	0.050	10.6	LOS A	0.2	1.3	0.60	0.78	0.60	47.3
Approach			208	4.6	208	4.6	0.147	6.1	LOS A	0.6	4.5	0.39	0.60	0.39	51.1
All Vehicles			874	8.3	874	8.3	0.154	2.6	NA	0.6	4.5	0.14	0.23	0.14	60.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [PM Peak w/ dev Princes/Mt Darragh South Pambula (Site Folder: Lot 1 & Lot 5 With Dev)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	40	27.0	40	27.0	0.190	7.5	LOS A	0.0	0.0	0.00	0.07	0.00	62.7
2	T1	All MCs	314	3.4	314	3.4	0.190	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	78.8
Approach			354	6.1	354	6.1	0.190	0.9	NA	0.0	0.0	0.00	0.07	0.00	76.6
North: Princes Highway															
8	T1	All MCs	268	4.3	268	4.3	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	All MCs	158	6.8	158	6.8	0.131	8.4	LOS A	0.6	4.4	0.45	0.68	0.45	52.2
Approach			426	5.2	426	5.2	0.141	3.1	NA	0.6	4.4	0.17	0.25	0.17	66.8
West: Mt Darragh Road															
10	L2	All MCs	138	7.7	138	7.7	0.119	5.9	LOS A	0.5	3.6	0.40	0.60	0.40	50.7
12	R2	All MCs	13	16.7	13	16.7	0.035	13.0	LOS A	0.1	0.9	0.66	0.81	0.66	44.7
Approach			151	8.5	151	8.5	0.119	6.5	LOS A	0.5	3.6	0.42	0.62	0.42	50.2
All Vehicles			931	6.1	931	6.1	0.190	2.8	NA	0.6	4.4	0.14	0.24	0.14	66.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [AM Peak w/ dev +30% Princes/Mt Darragh South Pambula (Site Folder: Lot 1 & Lot 5 With Dev)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

With Development
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	27	60.0	27	60.0	0.155	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	54.0
2	T1	All MCs	255	3.7	255	3.7	0.155	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	79.4
Approach			282	9.2	282	9.2	0.155	0.8	NA	0.0	0.0	0.00	0.06	0.00	75.9
North: Princes Highway															
8	T1	All MCs	280	7.5	280	7.5	0.151	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	105	16.3	105	16.3	0.086	6.9	LOS A	0.4	3.0	0.40	0.61	0.40	51.0
Approach			385	9.9	385	9.9	0.151	1.9	NA	0.4	3.0	0.11	0.17	0.11	57.2
West: Mt Darragh Road															
10	L2	All MCs	186	4.0	186	4.0	0.147	5.6	LOS A	0.6	4.5	0.36	0.58	0.36	51.6
12	R2	All MCs	24	9.5	24	9.5	0.052	10.7	LOS A	0.2	1.4	0.60	0.78	0.60	47.3
Approach			211	4.6	211	4.6	0.147	6.2	LOS A	0.6	4.5	0.39	0.60	0.39	51.1
All Vehicles			878	8.4	878	8.4	0.155	2.6	NA	0.6	4.5	0.14	0.24	0.14	60.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [PM Peak w/ dev +30% Princes/Mt Darragh South Pambula (Site Folder: Lot 1 & Lot 5 With Dev)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	40	27.0	40	27.0	0.190	7.5	LOS A	0.0	0.0	0.00	0.07	0.00	62.7
2	T1	All MCs	314	3.4	314	3.4	0.190	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	78.8
Approach			354	6.1	354	6.1	0.190	0.9	NA	0.0	0.0	0.00	0.07	0.00	76.6
North: Princes Highway															
8	T1	All MCs	268	4.3	268	4.3	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	All MCs	159	6.8	159	6.8	0.132	8.4	LOS A	0.6	4.4	0.45	0.68	0.45	52.2
Approach			427	5.2	427	5.2	0.141	3.2	NA	0.6	4.4	0.17	0.25	0.17	66.8
West: Mt Darragh Road															
10	L2	All MCs	139	7.7	139	7.7	0.120	5.9	LOS A	0.5	3.6	0.40	0.60	0.40	50.7
12	R2	All MCs	13	16.7	13	16.7	0.035	13.0	LOS A	0.1	0.9	0.66	0.81	0.66	44.7
Approach			152	8.4	152	8.5	0.120	6.5	LOS A	0.5	3.6	0.42	0.62	0.42	50.2
All Vehicles			933	6.1	933	6.1	0.190	2.8	NA	0.6	4.4	0.15	0.24	0.15	66.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Lot 23 DP 1292533

Mt Darragh Road

MOVEMENT SUMMARY

▽ **Site: 101 [AM Peak w/ dev Princes/Mt Darragh South Pambula (Site Folder: Lot 23 With Dev)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

With Development
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	26	60.0	26	60.0	0.154	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	54.0
2	T1	All MCs	255	3.7	255	3.7	0.154	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	79.4
Approach			281	9.0	281	9.0	0.154	0.8	NA	0.0	0.0	0.00	0.06	0.00	76.1
North: Princes Highway															
8	T1	All MCs	280	7.5	280	7.5	0.151	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	105	16.3	105	16.3	0.086	6.9	LOS A	0.4	3.0	0.40	0.61	0.40	51.0
Approach			385	9.9	385	9.9	0.151	1.9	NA	0.4	3.0	0.11	0.17	0.11	57.2
West: Mt Darragh Road															
10	L2	All MCs	192	4.0	192	4.0	0.152	5.6	LOS A	0.6	4.6	0.36	0.58	0.36	51.6
12	R2	All MCs	23	9.5	23	9.5	0.050	10.6	LOS A	0.2	1.3	0.60	0.78	0.60	47.3
Approach			215	4.6	215	4.6	0.152	6.1	LOS A	0.6	4.6	0.39	0.60	0.39	51.1
All Vehicles			881	8.3	881	8.3	0.154	2.6	NA	0.6	4.6	0.14	0.24	0.14	60.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ Site: 101 [PM Peak w/ dev Princes/Mt Darragh South Pambula (Site Folder: Lot 23 With Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	41	27.0	41	27.0	0.191	7.5	LOS A	0.0	0.0	0.00	0.07	0.00	62.7
2	T1	All MCs	314	3.4	314	3.4	0.191	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	78.8
Approach			355	6.1	355	6.1	0.191	0.9	NA	0.0	0.0	0.00	0.07	0.00	76.5
North: Princes Highway															
8	T1	All MCs	268	4.3	268	4.3	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	All MCs	163	6.8	163	6.8	0.136	8.5	LOS A	0.6	4.5	0.46	0.68	0.46	52.2
Approach			432	5.2	432	5.2	0.141	3.2	NA	0.6	4.5	0.17	0.26	0.17	66.6
West: Mt Darragh Road															
10	L2	All MCs	139	7.7	139	7.7	0.120	5.9	LOS A	0.5	3.6	0.40	0.60	0.40	50.7
12	R2	All MCs	13	16.7	13	16.7	0.035	13.1	LOS A	0.1	0.9	0.67	0.82	0.67	44.6
Approach			152	8.4	152	8.5	0.120	6.5	LOS A	0.5	3.6	0.42	0.62	0.42	50.2
All Vehicles			938	6.1	938	6.1	0.191	2.9	NA	0.6	4.5	0.15	0.25	0.15	66.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [AM Peak w/ dev +30% Princes/Mt Darragh South Pambula (Site Folder: Lot 23 With Dev)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

With Development
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	27	60.0	27	60.0	0.155	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	54.0
2	T1	All MCs	255	3.7	255	3.7	0.155	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	79.4
Approach			282	9.2	282	9.2	0.155	0.8	NA	0.0	0.0	0.00	0.06	0.00	75.9
North: Princes Highway															
8	T1	All MCs	280	7.5	280	7.5	0.151	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	105	16.3	105	16.3	0.086	6.9	LOS A	0.4	3.0	0.40	0.61	0.40	51.0
Approach			385	9.9	385	9.9	0.151	1.9	NA	0.4	3.0	0.11	0.17	0.11	57.2
West: Mt Darragh Road															
10	L2	All MCs	195	4.0	195	4.0	0.154	5.6	LOS A	0.7	4.7	0.36	0.58	0.36	51.6
12	R2	All MCs	23	9.5	23	9.5	0.050	10.7	LOS A	0.2	1.3	0.60	0.78	0.60	47.3
Approach			218	4.6	218	4.6	0.154	6.1	LOS A	0.7	4.7	0.39	0.60	0.39	51.1
All Vehicles			885	8.4	885	8.4	0.155	2.6	NA	0.7	4.7	0.14	0.24	0.14	60.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [PM Peak w/ dev +30% Princes/Mt Darragh South Pambula (Site Folder: Lot 23 With Dev)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	42	27.0	42	27.0	0.191	7.5	LOS A	0.0	0.0	0.00	0.08	0.00	62.6
2	T1	All MCs	314	3.4	314	3.4	0.191	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	78.8
Approach			356	6.2	356	6.2	0.191	0.9	NA	0.0	0.0	0.00	0.08	0.00	76.4
North: Princes Highway															
8	T1	All MCs	268	4.3	268	4.3	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	All MCs	165	6.8	165	6.8	0.138	8.5	LOS A	0.6	4.6	0.46	0.68	0.46	52.2
Approach			434	5.3	434	5.3	0.141	3.2	NA	0.6	4.6	0.17	0.26	0.17	66.5
West: Mt Darragh Road															
10	L2	All MCs	149	7.7	149	7.7	0.129	5.9	LOS A	0.5	3.9	0.40	0.60	0.40	50.7
12	R2	All MCs	14	16.7	14	16.7	0.039	13.2	LOS A	0.1	1.0	0.67	0.82	0.67	44.6
Approach			163	8.5	163	8.5	0.129	6.5	LOS A	0.5	3.9	0.42	0.62	0.42	50.2
All Vehicles			953	6.2	953	6.2	0.191	2.9	NA	0.6	4.6	0.15	0.25	0.15	66.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Area 3

Pambula Catchment

MOVEMENT SUMMARY

Site: 101 [AM Peak Princes/Mt Darragh South Pambula w/o dev (Site Folder: Future +10 yrs Area 3 Full Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	31	60.0	31	60.0	0.179	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	54.0
2	T1	All MCs	296	3.7	296	3.7	0.179	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	79.4
Approach			326	9.0	326	9.0	0.179	0.8	NA	0.0	0.0	0.00	0.06	0.00	76.0
North: Princes Highway															
8	T1	All MCs	326	7.5	326	7.5	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	120	16.3	120	16.3	0.104	7.2	LOS A	0.5	3.6	0.44	0.64	0.44	50.9
Approach			446	9.9	446	9.9	0.175	2.0	NA	0.5	3.6	0.12	0.17	0.12	57.2
West: Mt Darragh Road															
10	L2	All MCs	212	4.0	212	4.0	0.175	5.8	LOS A	0.7	5.4	0.40	0.60	0.40	51.5
12	R2	All MCs	25	9.5	25	9.5	0.065	12.4	LOS A	0.2	1.7	0.66	0.85	0.66	46.2
Approach			237	4.6	237	4.6	0.175	6.5	LOS A	0.7	5.4	0.43	0.63	0.43	50.9
All Vehicles			1009	8.3	1009	8.3	0.179	2.7	NA	0.7	5.4	0.15	0.24	0.15	60.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [PM Peak Princes/Mt Darragh South Pambula w/o dev (Site Folder: Future +10 yrs Area 3 Full Development)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	45	27.0	45	27.0	0.220	7.5	LOS A	0.0	0.0	0.00	0.07	0.00	62.7
2	T1	All MCs	364	3.4	364	3.4	0.220	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	78.8
Approach			409	6.0	409	6.0	0.220	0.9	NA	0.0	0.0	0.00	0.07	0.00	76.6
North: Princes Highway															
8	T1	All MCs	312	4.3	312	4.3	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	All MCs	180	6.8	180	6.8	0.160	8.8	LOS A	0.7	5.3	0.50	0.71	0.50	52.1
Approach			492	5.2	492	5.2	0.164	3.2	NA	0.7	5.3	0.18	0.26	0.18	66.8
West: Mt Darragh Road															
10	L2	All MCs	159	7.7	159	7.7	0.146	6.2	LOS A	0.6	4.4	0.44	0.63	0.44	50.6
12	R2	All MCs	15	16.7	15	16.7	0.051	15.8	LOS B	0.2	1.3	0.73	0.88	0.73	43.2
Approach			174	8.5	174	8.5	0.146	7.0	LOS A	0.6	4.4	0.46	0.65	0.46	49.9
All Vehicles			1075	6.0	1075	6.0	0.220	2.9	NA	0.7	5.3	0.16	0.25	0.16	66.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [AM Peak w/dev Princes/Mt Darragh South Pambula (Site Folder: Future +10 yrs Area 3 Full Development)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	36	60.0	36	60.0	0.183	8.1	LOS A	0.0	0.0	0.00	0.07	0.00	53.9
2	T1	All MCs	296	3.7	296	3.7	0.183	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	79.3
Approach			332	9.8	332	9.8	0.183	0.9	NA	0.0	0.0	0.00	0.07	0.00	75.5
North: Princes Highway															
8	T1	All MCs	326	7.5	326	7.5	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	142	16.3	142	16.3	0.124	7.3	LOS A	0.6	4.4	0.45	0.65	0.45	50.8
Approach			468	10.2	468	10.2	0.175	2.2	NA	0.6	4.4	0.14	0.20	0.14	56.8
West: Mt Darragh Road															
10	L2	All MCs	311	4.0	311	4.0	0.257	5.9	LOS A	1.2	8.4	0.42	0.61	0.42	51.5
12	R2	All MCs	37	9.5	37	9.5	0.099	13.1	LOS A	0.3	2.5	0.68	0.86	0.68	45.9
Approach			347	4.6	347	4.6	0.257	6.7	LOS A	1.2	8.4	0.45	0.63	0.45	50.8
All Vehicles			1147	8.4	1147	8.4	0.257	3.2	NA	1.2	8.4	0.19	0.29	0.19	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [PM Peak w/dev Princes/Mt Darragh South Pambula (Site Folder: Future +10 yrs Area 3 Full Development)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Princes Highway															
1	L2	All MCs	68	27.0	68	27.0	0.235	7.5	LOS A	0.0	0.0	0.00	0.10	0.00	62.4
2	T1	All MCs	364	3.4	364	3.4	0.235	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	78.4
Approach			433	7.1	433	7.1	0.235	1.2	NA	0.0	0.0	0.00	0.10	0.00	75.3
North: Princes Highway															
8	T1	All MCs	314	4.3	314	4.3	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	All MCs	273	6.8	273	6.8	0.251	9.1	LOS A	1.2	8.7	0.54	0.73	0.54	51.9
Approach			586	5.5	586	5.5	0.251	4.3	NA	1.2	8.7	0.25	0.34	0.25	63.9
West: Mt Darragh Road															
10	L2	All MCs	185	7.7	185	7.7	0.170	6.3	LOS A	0.7	5.2	0.44	0.64	0.44	50.6
12	R2	All MCs	18	16.7	18	16.7	0.075	18.7	LOS B	0.2	1.8	0.78	0.90	0.78	41.8
Approach			203	8.5	203	8.5	0.170	7.4	LOS A	0.7	5.2	0.47	0.66	0.47	49.7
All Vehicles			1222	6.6	1222	6.6	0.251	3.7	NA	1.2	8.7	0.20	0.31	0.20	64.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ **Site: 101 [AM Peak w/dev +30% Princes/Mt Darragh South Pambula (Site Folder: Future + 30% 2nd Dwelling)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	38	60.0	38	60.0	0.184	8.1	LOS A	0.0	0.0	0.00	0.07	0.00	53.9
2	T1	All MCs	296	3.7	296	3.7	0.184	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	79.3
Approach			334	10.1	334	10.1	0.184	0.9	NA	0.0	0.0	0.00	0.07	0.00	75.3
North: Princes Highway															
8	T1	All MCs	326	7.5	326	7.5	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	148	16.3	148	16.3	0.130	7.3	LOS A	0.6	4.6	0.45	0.65	0.45	50.8
Approach			475	10.3	475	10.3	0.175	2.3	NA	0.6	4.6	0.14	0.20	0.14	56.7
West: Mt Darragh Road															
10	L2	All MCs	340	4.0	340	4.0	0.281	6.0	LOS A	1.3	9.4	0.43	0.61	0.43	51.4
12	R2	All MCs	40	9.5	40	9.5	0.109	13.3	LOS A	0.4	2.8	0.69	0.86	0.69	45.8
Approach			380	4.6	380	4.6	0.281	6.7	LOS A	1.3	9.4	0.46	0.64	0.46	50.8
All Vehicles			1188	8.4	1188	8.4	0.281	3.3	NA	1.3	9.4	0.20	0.31	0.20	58.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

▽ Site: 101 [PM Peak w/dev +30% Princes/Mt Darragh South Pambula (Site Folder: Future + 30% 2nd Dwelling)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Princes Highway															
1	L2	All MCs	76	27.0	76	27.0	0.241	7.5	LOS A	0.0	0.0	0.00	0.11	0.00	62.3
2	T1	All MCs	366	3.4	366	3.4	0.241	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	78.2
Approach			442	7.4	442	7.4	0.241	1.3	NA	0.0	0.0	0.00	0.11	0.00	74.9
North: Princes Highway															
8	T1	All MCs	314	4.3	314	4.3	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	All MCs	301	6.8	301	6.8	0.281	9.3	LOS A	1.3	9.9	0.55	0.74	0.55	51.8
Approach			615	5.5	615	5.5	0.281	4.6	NA	1.3	9.9	0.27	0.36	0.27	63.1
West: Mt Darragh Road															
10	L2	All MCs	193	7.7	193	7.7	0.177	6.3	LOS A	0.7	5.5	0.45	0.64	0.45	50.6
12	R2	All MCs	19	16.7	19	16.7	0.084	19.8	LOS B	0.3	2.0	0.79	0.91	0.79	41.2
Approach			212	8.5	212	8.5	0.177	7.5	LOS A	0.7	5.5	0.48	0.66	0.48	49.6
All Vehicles			1268	6.7	1268	6.7	0.281	3.9	NA	1.3	9.9	0.21	0.33	0.21	63.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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