

NOVEMBER 2022

PLANNING PROPOSAL - 12-20 SHIRALEE ROAD, ORANGE NSW

CURRAJONG
PLANNING, PROPERTY + PROJECT MANAGEMENT

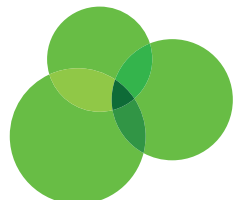
Appendix E

Traffic Impact Assessment

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12-20 SHIRALEE ROAD, ORANGE

199 LOT RESIDENTIAL SUBDIVISION

TRANSPORT IMPACT ASSESSMENT

PREPARED FOR OAKSTAND NSW PTY LTD
17 NOVEMBER 2022 | 300304208



Revision	Date	Description	Author	Quality Check	Approver
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1 Introduction

1.1 Background

A Planning Proposal is to be lodged with Orange City Council for a residential subdivision at 12-20 Shiralee Road, Orange. The site is within the broader Shiralee precinct located south of the Orange urban area. The subdivision comprises 199 residential lots (with potential for around 208 dwellings) and is based on the lot layout indicated within the Shiralee DCP, albeit with additional lots adjacent to the open space in the centre of the site.

Oakstand NSW Pty Ltd engaged Stantec Australia Pty Ltd to prepare a Transport Impact Assessment to accompany the Planning Proposal.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- existing traffic and parking conditions surrounding the site
- suitability of the proposed parking in terms of supply (quantum) and layout
- service vehicle requirements
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposed development
- suitability of the proposed access arrangements for the site
- the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- Orange Development Control Plan 2004 (DCP 2004)
- Shiralee Development Control Plan (Shiralee DCP)
- Orange Local Environmental Plan 2011 (LEP 2011)
- Proposed Subdivision of Lots 1 DP630681, A DP381933, 1 DP381932 & A DP381935 – Shiralee Road – Orange, Proposed Subdivision Layout – Stage 1 prepared by Carpenter, Collins, Craig dated 2 November 2022
- other documents and data as referenced in this report.



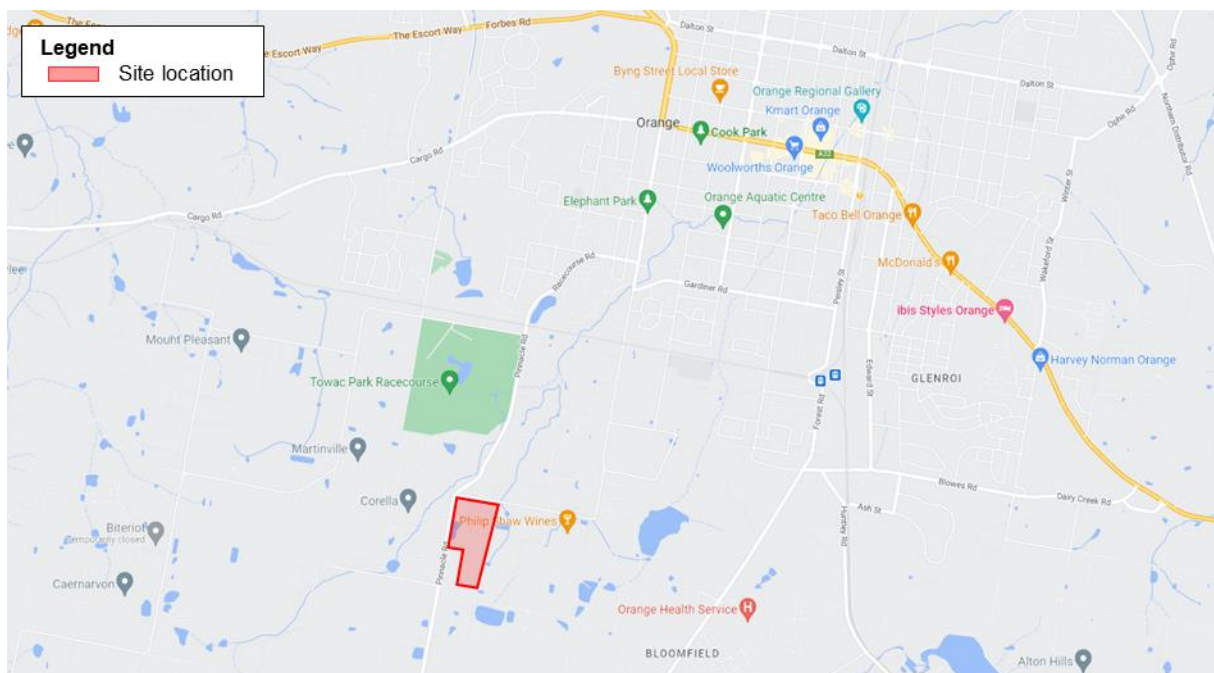
2 Existing Conditions

2.1 Location

The site is at 12-20 Shiralee Road, Orange with a frontage of around 360 metres to Shiralee Road to the north and Pinnacle Road to the west and is currently occupied by two rural residential dwellings. The surrounding properties include other low density residential dwellings and rural land with a residential subdivision currently under construction immediately to the east.

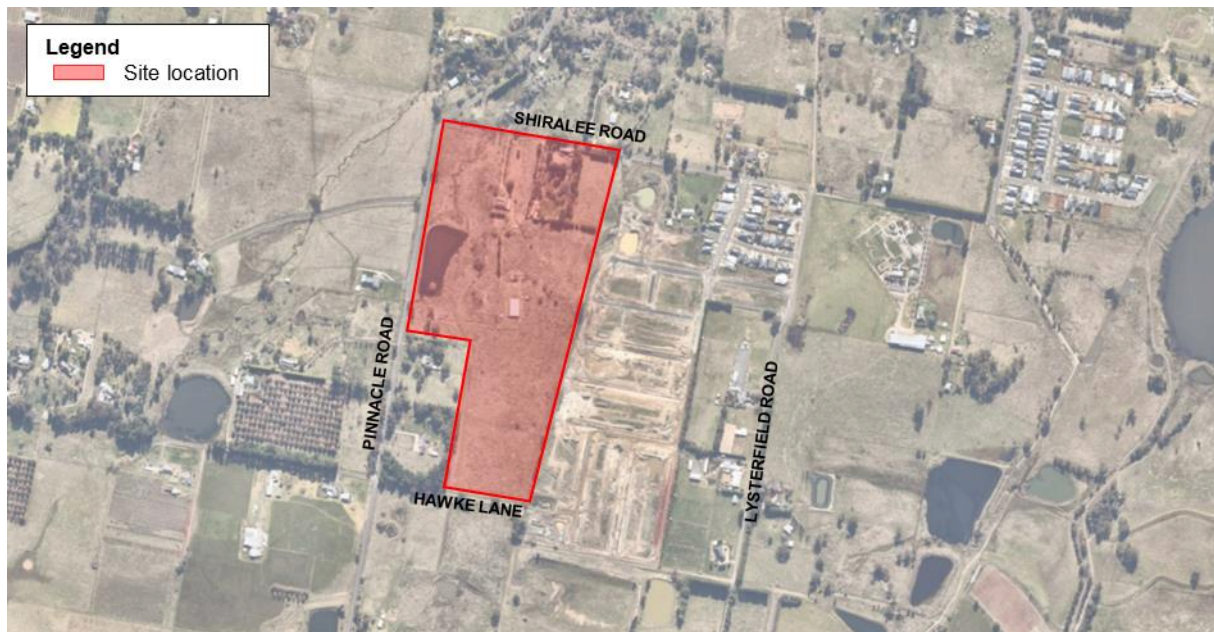
The location of the site and its surrounding environs is shown in Figure 1 and Figure 2.

Figure 1: Site location



Base image source: <http://www.street-directory.com.au/>

Figure 2: Aerial view



Base image source: Nearmap

2.2 Surrounding Road Network

Key roads surrounding the site include Shiralee Road and Pinnacle Road with a summary provided in Table 1.

Table 1: Surrounding road network

Road	Classification	Description	Photo
Shiralee Road	Local Road	<ul style="list-style-type: none"> Two-way local road along the northern boundary of the site. Approximately 6-metre-wide carriageway, allowing for one travel lane in each direction. 80km/h posted speed limit. 	
Pinnacle Road	Local Road	<ul style="list-style-type: none"> Two-way collector road along the western boundary of the site. Approximately 8.5-metre-wide carriageway with one travel lane in each direction. Provides connection from the site to Orange town centre. 80km/h speed limit. 	

Image source: Google Streetview

2.3 Traffic Volumes

Stantec commissioned traffic surveys at the Pinnacle Road/ Shiralee Road intersection on a typical weekday in October 2022 during the following peak periods:

- 6:30am and 9:30am
- 3:00pm and 6:00pm.

The weekday AM and PM peak hours were found to occur from 8:15am to 9:15am and 3:45pm to 4:45pm respectively, with the traffic volumes summarised in Figure 3 and Figure 4.

Figure 3: Existing AM peak hour traffic volumes

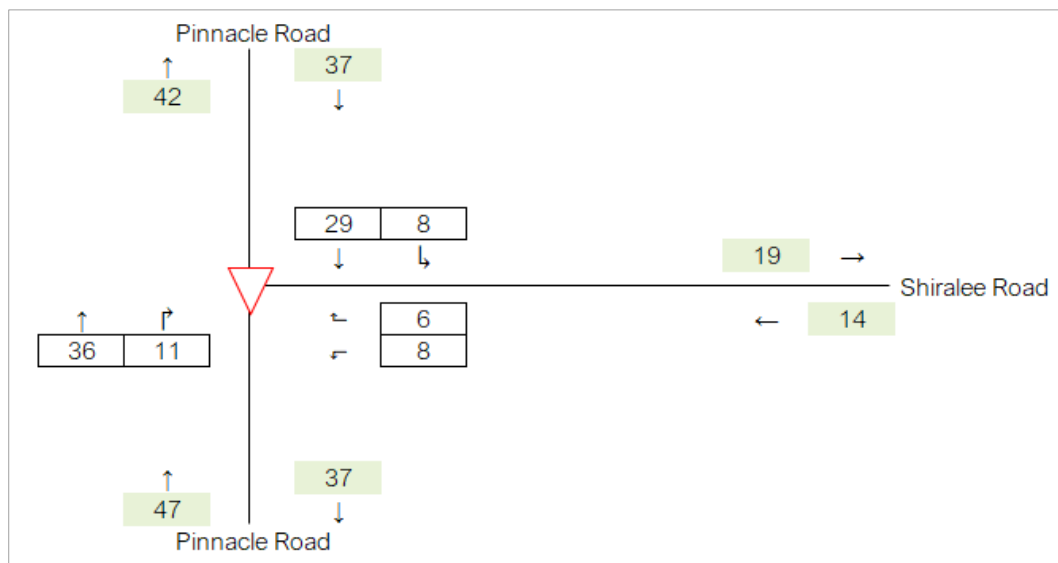
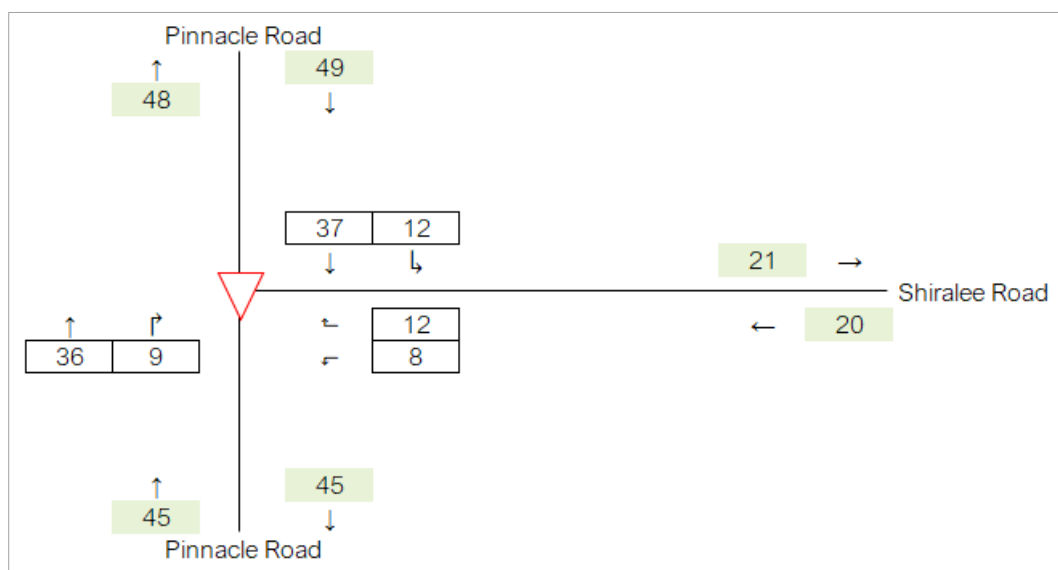


Figure 4: Existing PM peak hour traffic volumes



2.4 Intersection Operation

The operation of the Pinnacle Road/ Shiralee Road intersection has been assessed using SIDRA INTERSECTION (SIDRA), a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the TfNSW, is vehicle delay. SIDRA determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2 shows the criteria that SIDRA adopts in assessing the level of service.

Table 2: SIDRA level of service criteria

Level of service (LOS)	Average delay per vehicle (secs/veh)	Traffic signals, roundabout	Give way & stop sign
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	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 3 presents a summary of the existing operation of the Pinnacle Road/ Shiralee Road intersection during the weekday peak hours.

Table 3: Existing intersection operating conditions

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
AM	South	0.03	6	1	A
	East	0.01	6	1	A
	North	0.02	6	0	A
PM	South	0.03	6	1	A
	East	0.01	6	1	A
	North	0.03	6	0	A

Table 3 indicates the Pinnacle Road/ Shiralee Road intersection currently operates well at a LOS A, with minimal queuing and delay across the intersection.



2.5 Public Transport

The site has limited connection to public transport services, with the closest bus stop located 2.5 kilometres to the north-east towards Orange town centre. Orange town centre itself is serviced by several local bus services, as well as train services through Orange Station.

2.6 Shiralee DCP

As mentioned, the site is within a precinct known as Shiralee which includes a site specific DCP which came into effect in December 2015. The boundary for Shiralee is shown in Figure 5.

Figure 5: Shiralee boundary

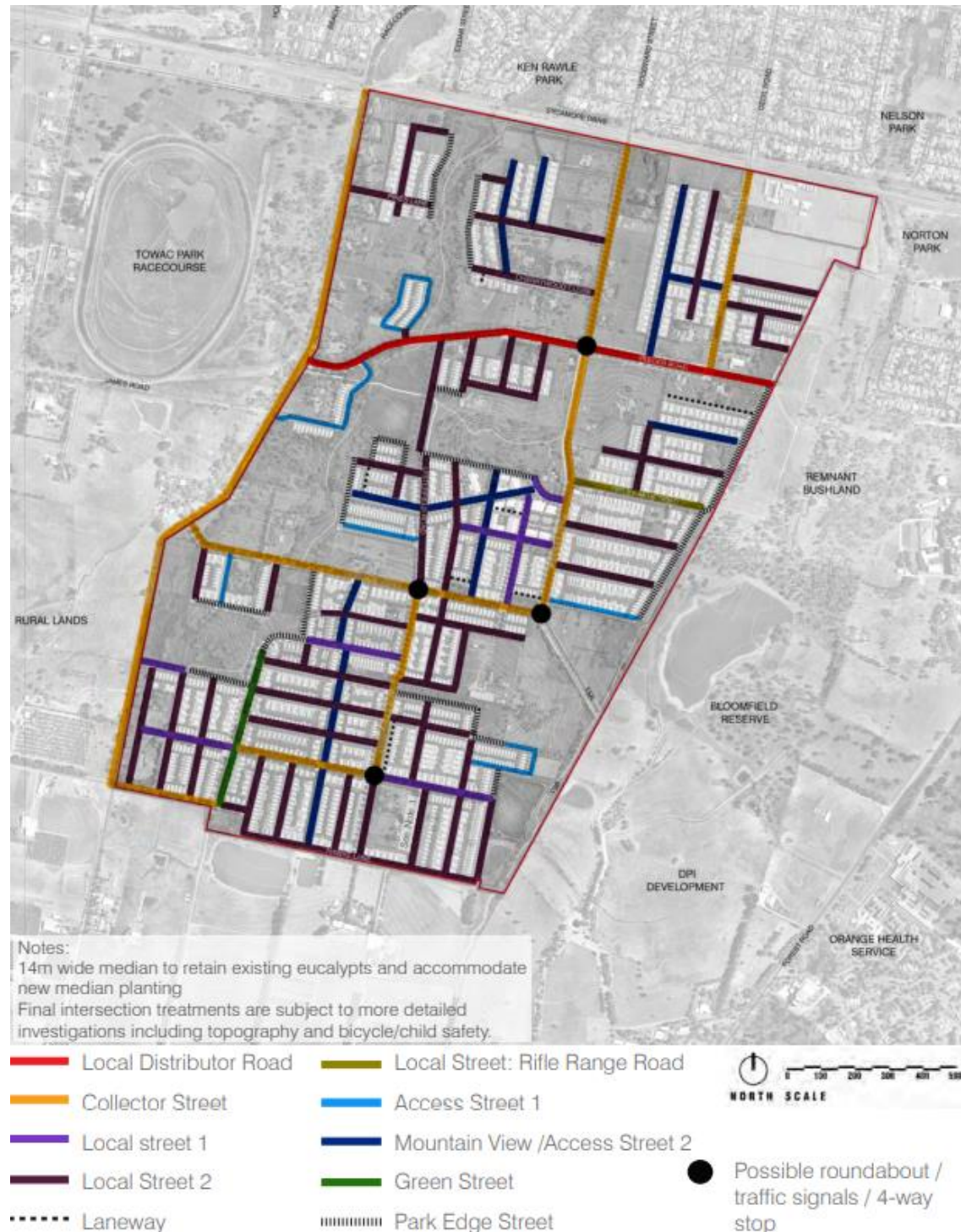


Source: orange.nsw.gov.au/Shiralee-Development-Control-Plan-2015.pdf

12-20 Shiralee Road, Orange 2 Existing Conditions

Figure 6 outlines the envisaged internal road layout through Shiralee. Specific to the site, Shiralee Road along the northern boundary of the site is a Collector Road, with a mixture of Local Streets, Access Streets and Laneways also indicated throughout the site.

Figure 6: Shiralee road hierarchy



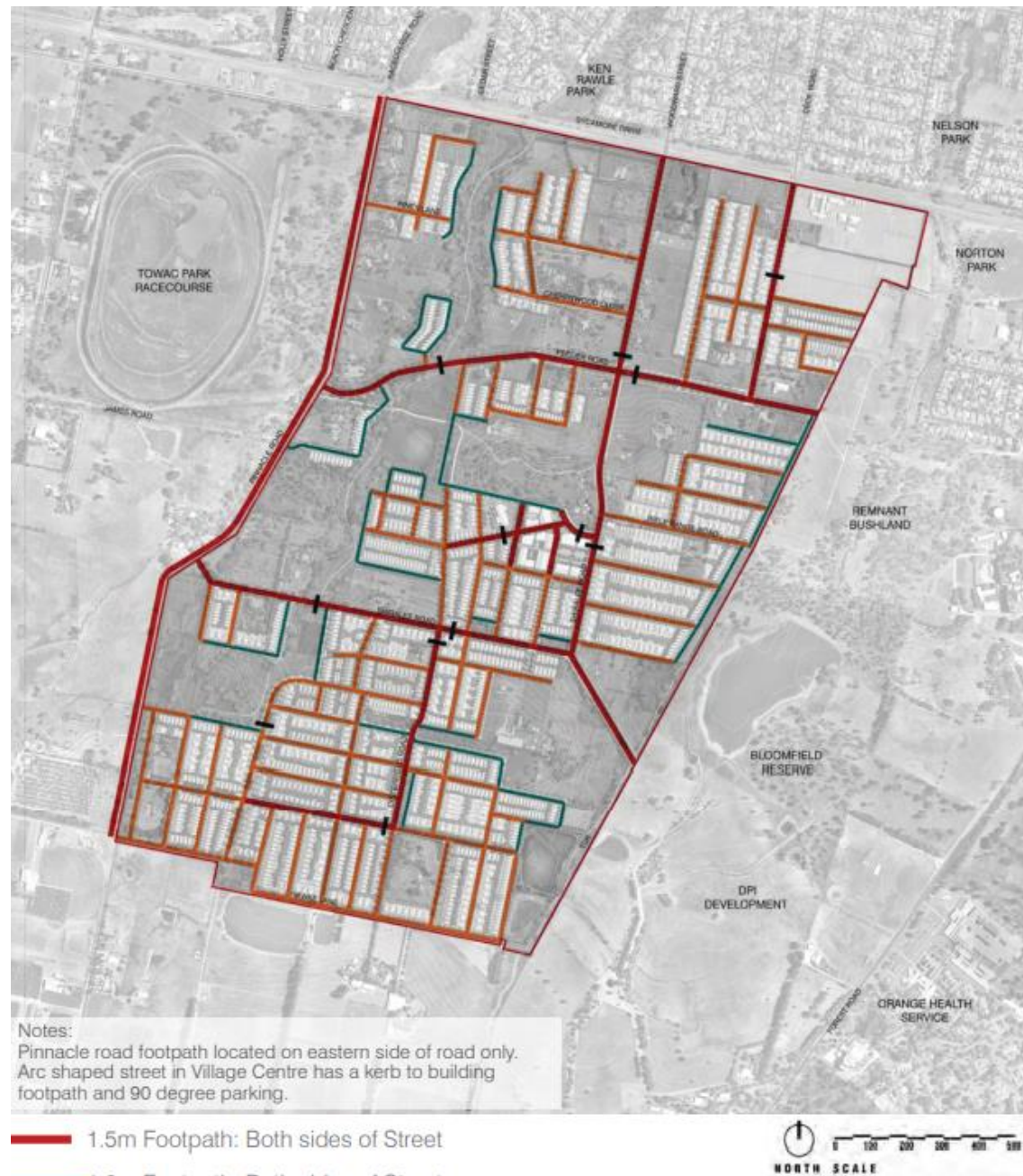
Source: orange.nsw.gov.au/Shiralee-Development-Control-Plan-2015.pdf



12-20 Shiralee Road, Orange 2 Existing Conditions

The Shiralee DCP also outlines the proposed footpath network through the precinct, as shown in Figure 7. This indicates that 1.5-metre-wide footpaths are envisaged for both sides of Shiralee Road along the northern boundary of the site, with 1.2-metre-wide footpaths on both sides of most internal roads. Select roads include footpaths on one side only.

Figure 7: Shiralee footpath network



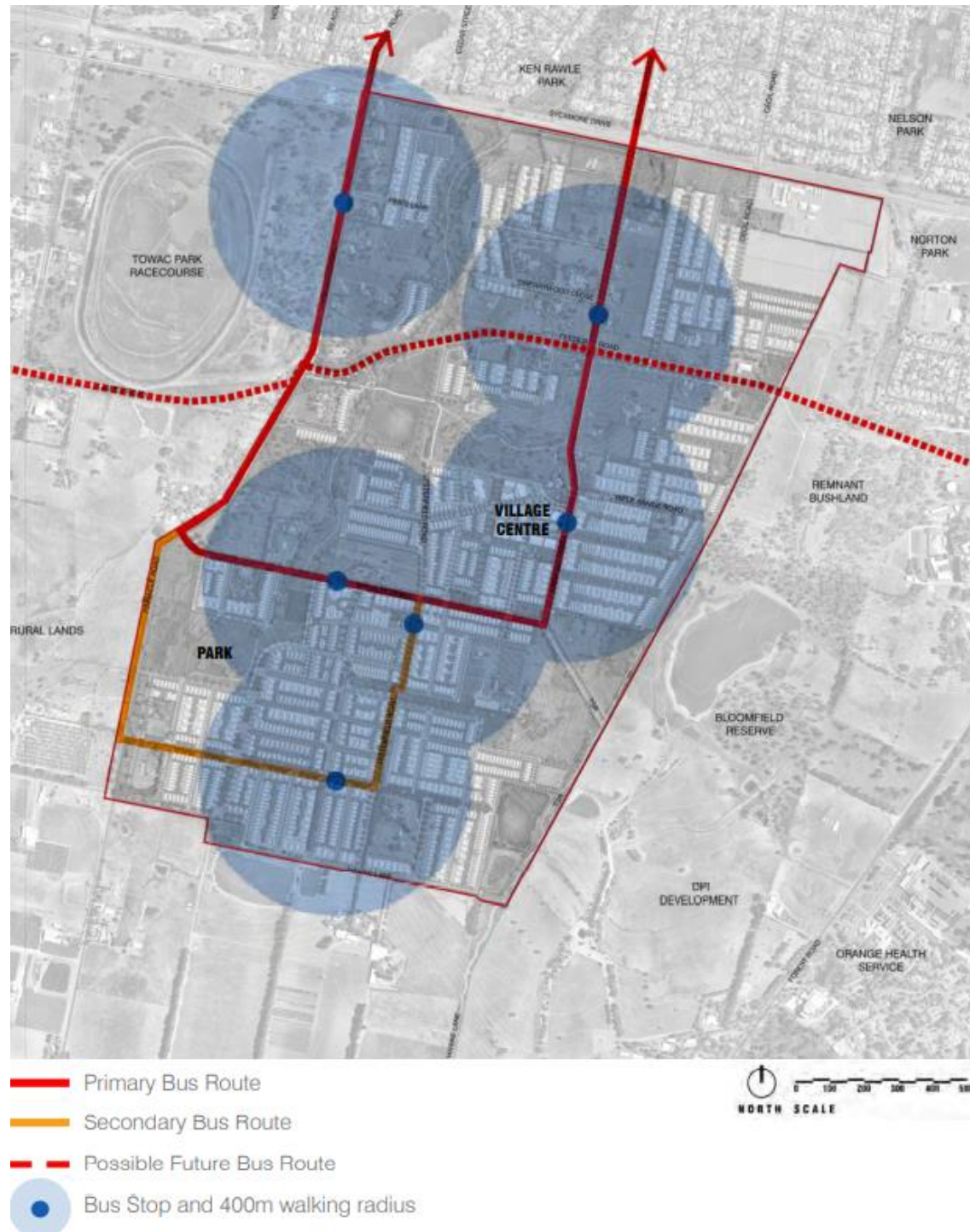
Source: orange.nsw.gov.au/Shiralee-Development-Control-Plan-2015.pdf



12-20 Shiralee Road, Orange 2 Existing Conditions

A future bus network is also proposed to service Shiralee, with the primary route travelling along Shiralee Road and a secondary route along an internal road that runs through the southern side of the site, as shown in Figure 8.

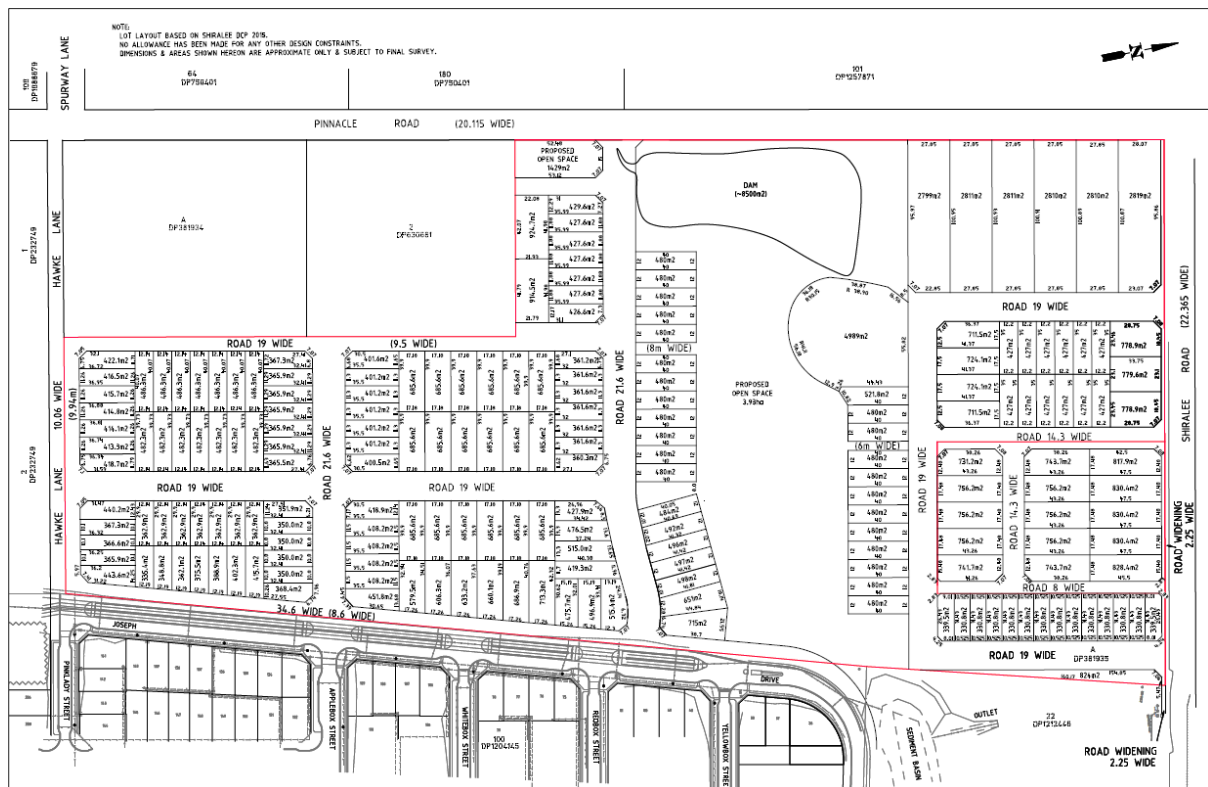
Figure 8: Shiralee bus network



Source: orange.nsw.gov.au/Shiralee-Development-Control-Plan-2015.pdf

Internal roads have generally been designed to Council standards and include footpaths on both sides of most roads with the exception of laneways. It is anticipated that internal walking connections would also be provided through the public open space central to the site, ensuring suitable walking connectivity through and surrounding the site. The subdivision plan is shown in Figure 9.

Figure 9: Subdivision plan



4 Parking, Loading and Layout Assessment

4.1 Car Parking

As a residential subdivision, the development itself does not generate any on-site parking demand, however on-site car parking will need to be further assessed as part of planning approvals for each residential lot.

The car parking requirements for different development types are set out in DCP 2004 which recommends that a minimum of one car parking space, but preferably two spaces be provided per dwelling house, which can be readily achieved within each residential lot.

4.2 Loading and Servicing

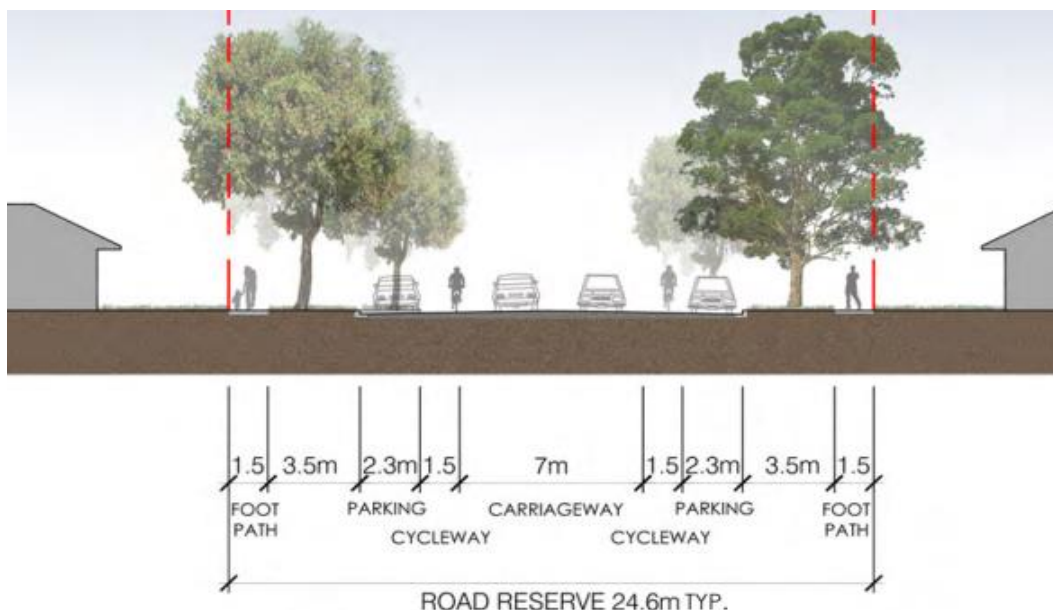
No specific loading dock provision rates are included in DCP 2004. Waste collection and servicing is proposed to occur on-street consistent with low density residential areas. Internal roads have been designed to Council standards with generally minimum 3-metre-wide travel lanes in one direction which can suitably accommodate service vehicles.

4.3 Road Layout

As discussed in Section 2.6, Shiralee DCP provides guidance on the internal road hierarchy and layout of Shiralee, with this previously detailed in Figure 6. This indicates that Shiralee Road would be designed as a Collector Road, with a mixture of Local Streets, Access Streets and Laneways throughout the site.

A summary of Council's road design standards is included in Figure 10 to Figure 14.

Figure 10: Collector Road characteristics



12-20 Shiralee Road, Orange
4 Parking, Loading and Layout Assessment

Figure 11: Local Road 1 characteristics

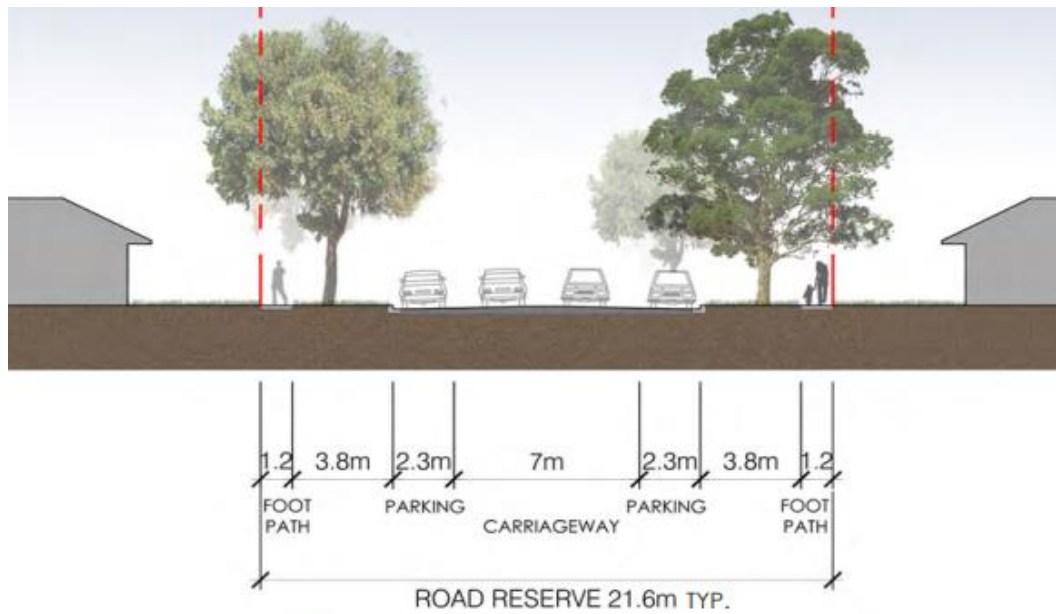


Figure 12: Local Road 2 characteristics

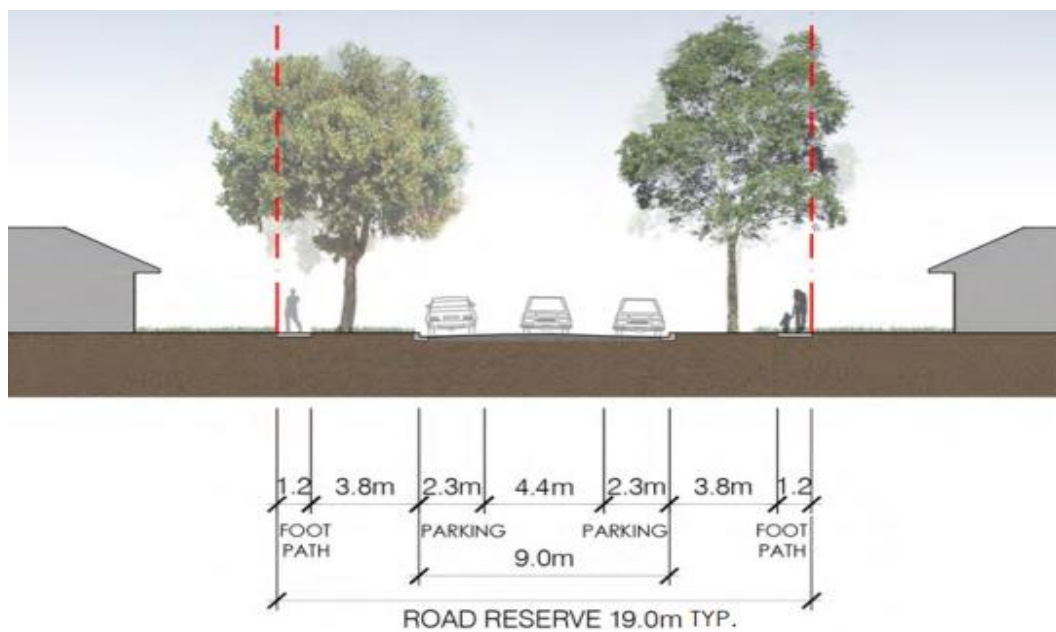
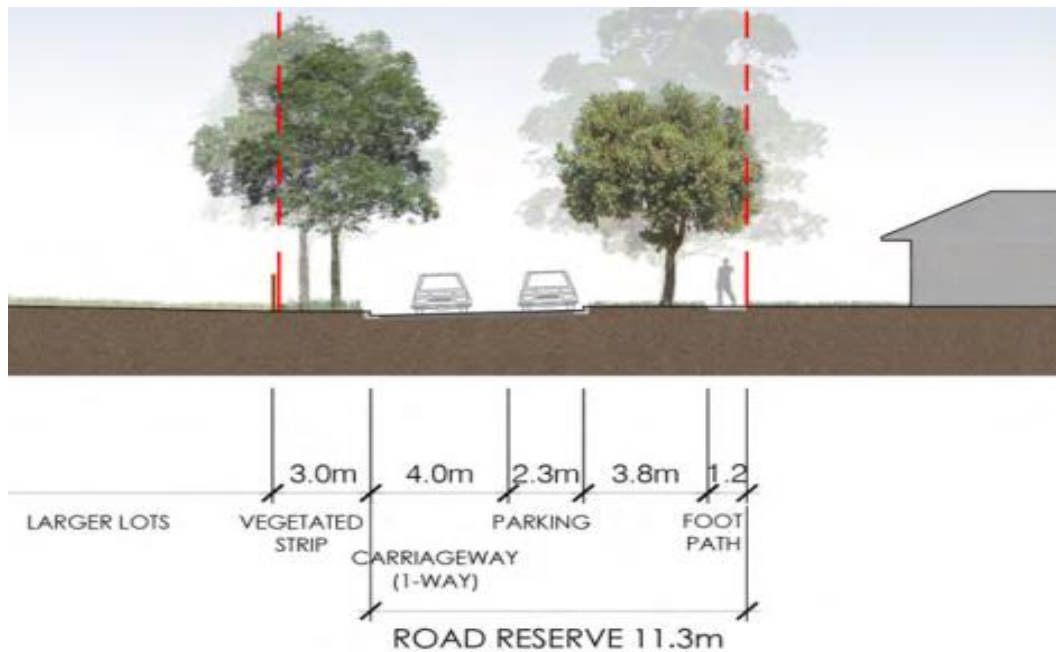
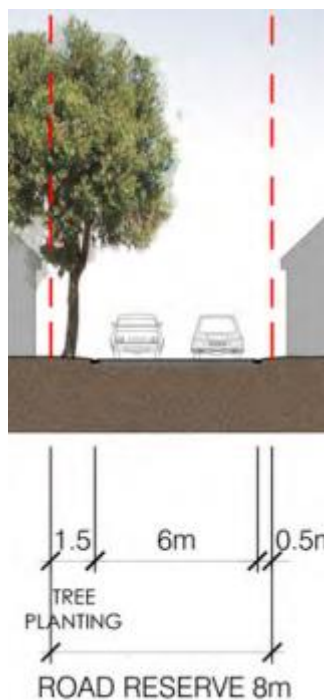


Figure 13: Access Street 1 characteristics



Source: orange.nsw.gov.au/Shiralee-Development-Control-Plan-2015.pdf

Figure 14: Laneway characteristics



Source: orange.nsw.gov.au/Shiralee-Development-Control-Plan-2015.pdf

Most of the proposed roads through the site have generally been designed in accordance with Shiralee DCP. The only deviations to that recommended are as follows:

- An additional north-south Laneway is proposed off Shiralee Road.
- An additional east-west Access Street is proposed on the northern side of the site.

12-20 Shiralee Road, Orange
4 Parking, Loading and Layout Assessment

- Additional laneways are proposed to provide connection to the proposed open space from both the north and the south.
- Local Road Type 1 or 2 are proposed in place of the Laneways indicated in Shiralee DCP.

Overall, the above deviations are considered minor and acceptable noting that if anything, they provide greater amenity for vehicles, cyclists and pedestrians than that indicated in Shiralee DCP.



5 Traffic Impact Assessment

5.1 Traffic Generation

Traffic generation rates have been sourced from the TfNSW Guide to Traffic Generating Developments 2002 (the Guide) and Technical Direction: Updated Traffic Surveys (TDT 2013/ 04a).

The TDT 2013/ 04a recommends a rate of 0.71 and 0.78 vehicle trips per dwelling in the weekday AM and PM peak hours respectively for low density residential dwellings located in regional areas. Based on the proposal for 199 lots or the potential for up to 208 dwellings, it is estimated the proposed subdivision would generate up to 148 vehicle trips in the weekday AM peak hour and 162 vehicle trips in the weekday PM peak hour once the lots are fully developed.

5.2 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by several factors, including the:

- existing configuration of the surrounding road network and intersections providing access between the local and arterial road network
- distribution of households in the vicinity of the site
- surrounding employment centres, retail centres and schools in relation to the site.

Having consideration to the above and for the purposes of estimating vehicle movements, it is estimated that 80 per cent of traffic would travel north and 20 per cent south.

Consideration has also been given to the proportion of the development that will likely access the site via Shiralee Road and Pinnacle Road. Overall, around 35 per cent of development traffic has been assumed to access the site via Shiralee Road, with the remaining 65 per cent assumed to use the Pinnacle Road access. This is also conservative given it assumes all site generated traffic would use Pinnacle Road on approach and departure despite Shiralee Road also connecting with Orange town centre and Mitchell Highway to the east.

In addition, it is assumed that 20 per cent of development trips would be inbound and 80 per cent outbound in the AM peak hour, reversed in the PM peak hour to reflect typical resident travel behaviour.

Figure 15 has been produced to summarise the assumed traffic development traffic volumes at the key Shiralee Road/ Pinnacle Road intersection during the weekday AM and PM peak hours.

Figure 15: AM development traffic at Shiralee Road/ Pinnacle Road intersection

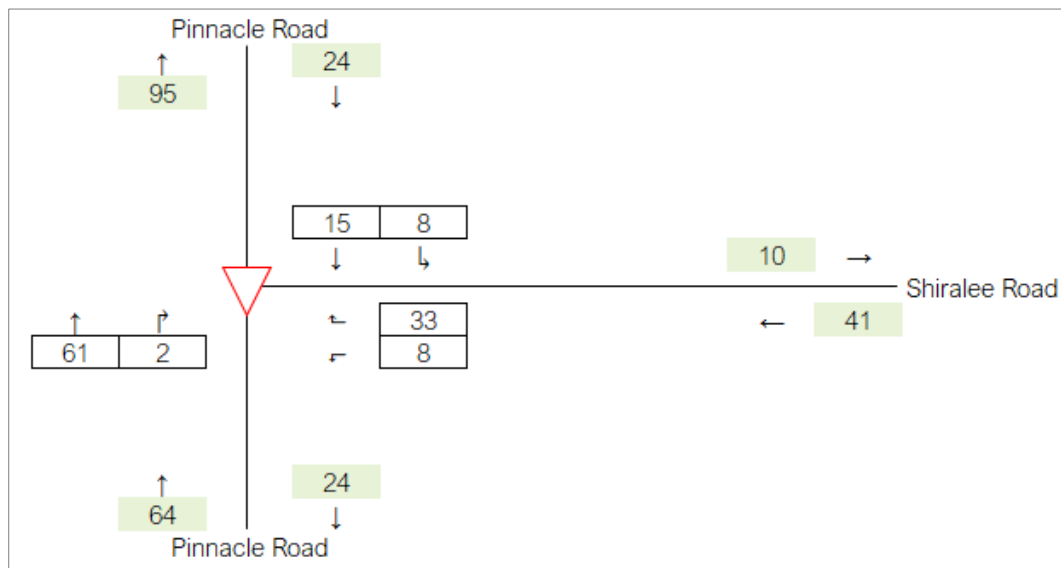
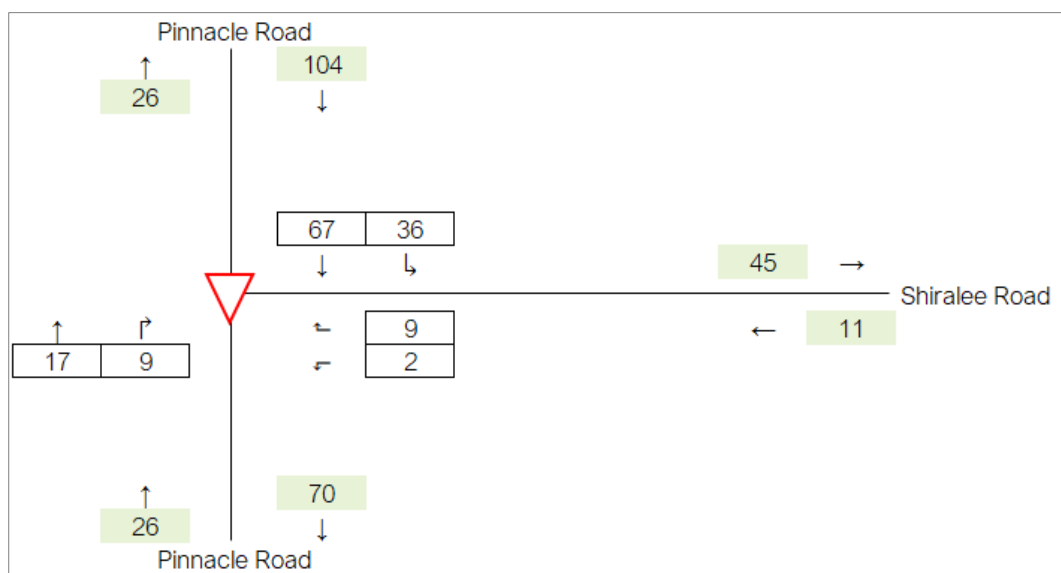


Figure 16: PM development traffic at Shiralee Road/ Pinnacle Road intersection



5.3 Traffic Impact

SIDRA modelling has been completed to consider the anticipated minor increase in traffic through the Shiralee Road/ Pinnacle Road intersection. Table 4 provides a summary of the anticipated intersection operation based on existing traffic volumes plus traffic associated with the proposed development.

Table 4: Existing with development intersection operating conditions

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
AM	South	0.06	6	1	A
	East	0.04	6	1	A
	North	0.03	6	0	A
PM	South	0.04	6	1	A
	East	0.02	6	1	A
	North	0.08	6	0	A

Table 4 indicates that the proposed development traffic would have a negligible impact on the operation of the Shiralee Road/ Pinnacle Road intersection compared to existing conditions, with only a minor increase in DOS and no change to delay or queues.

It is recognised the surrounding area is rapidly changing as a result of the Shiralee Master Plan which will increase traffic volumes on the surrounding road network. To consider this, a sensitivity assessment has been completed by increasing existing traffic volumes travelling through this intersection. A 10-fold increase in traffic volumes has been applied, equating to a conservatively high annual growth rate of around 25 per cent over 10 years.

Table 5 provides a summary of this anticipated future year scenario without the proposed development traffic.

Table 5: Future without development intersection operating conditions

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
AM	South	0.30	8	8	A
	East	0.12	11	3	A
	North	0.21	6	0	A
PM	South	0.29	9	9	A
	East	0.27	12	7	A
	North	0.27	6	0	A

Table 5 confirms that with the growth factors applied, the Shiralee Road/ Pinnacle Road intersection is expected to continue operating well at an overall LOS A.

Table 6 also includes a summary of the Shiralee Road/ Pinnacle Road intersection with the same future background traffic growth plus proposed development traffic.



Table 6: Future with development intersection operating conditions

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
AM	South	0.33	8	10	A
	East	0.22	12	5	A
	North	0.22	6	0	A
PM	South	0.33	10	12	A
	East	0.34	15	9	A
	North	0.33	6	0	A

Table 6 confirms again that the proposed development would have a minor impact on the Shiralee Road/ Pinnacle Road intersection compared to existing conditions, with negligible increases to delay and queuing.

Overall, the above traffic assessment demonstrates that the proposed residential subdivision could not be expected to compromise the safety or function of the surrounding road network even when significant background growth rates are applied. The intersection and surrounding road network have ample spare capacity to accommodate background growth, the proposed development and future traffic associated with Shiralee Master Plan.

6 Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

1. A Planning Proposal is to be lodged with Orange City Council for a residential subdivision at 12-20 Shiralee Road, Orange. The subdivision comprises 199 residential lots (potential for around 208 dwellings) and is based on the lot layout indicated within Shiralee DCP, albeit with additional lots adjacent to the open space in the centre of the site.
2. As a residential subdivision, the development itself does not generate any on-site parking demand, however on-site car parking will need to be further assessed as part of planning approvals for each residential lot. DCP 2004 recommends that a minimum of one car parking space, but preferably two spaces be provided per dwelling house, which can be readily achieved within each residential lot.
3. Waste collection and servicing would be on-street and consistent with what occurs for low density residential areas. Internal roads have been designed to Council standards with generally minimum 3-metre-wide travel lanes in one direction which can suitably accommodate service vehicles.
4. Most of the proposed roads through the site have generally been designed in accordance with Shiralee DCP. Any proposed deviations from the design requirements are considered minor and acceptable noting that if anything, they provide greater amenity for vehicles, cyclists and pedestrians than that indicated in the DCP.
5. Based on the proposal for 199 lots or the potential for up to 208 dwellings, it is estimated the proposed subdivision would generate up to 148 vehicle trips in the weekday AM peak hour and 162 vehicle trips in the weekday PM peak hour once the lots are developed.
6. SIDRA modelling has been completed at the Pinnacle Road/ Shiralee Road intersection based on existing traffic volumes through the intersection, as well a sensitivity test to consider increased volumes associated with development of the broader Shiralee precinct.
7. Traffic modelling confirms that the Shiralee Master Plan and specifically the proposed 199 lot residential subdivision could not be expected to compromise the safety or function of the surrounding road network.