Yarragon Township Plan

Transport Impact Assessment

210823TIA001E-F.docx

19 October 2022

onemile**grid**

ABN: 79 168 115 679

(03) 9939 8250
56 Down Street

COLLINGWOOD, VIC 3066
www.onemilegrid.com.au

DOCUMENT INFORMATION

Prepared for	SMEC		
File Name	210823TIA001E-F.docx	**Report Date**	19 October 2022
Prepared by	Samuel Freeman	**Reviewed by**	Jamie Spratt
Signature		**Signature**	

*© One Mile Grid Pty Ltd. This document has been prepared by **one**mile**grid** for the sole use and benefit of the client as per the terms of engagement. It may not be modified or altered, copied, reproduced, sold or transferred in whole or in part in any format to any person other than by agreement. **one**mile**grid** does not assume responsibility or liability to any third party arising out of use or misuse of this document.*

CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

onemile**grid** has been requested by SMEC to assist with the preparation of the Yarragon Township Plan, which aims to establish the strategic framework for future land use and development in the area.

As part of this assessment the subject site has been inspected with due consideration of the structure plan investigations, traffic and parking data has been sourced and relevant background reports have been reviewed.

2 PROJECT BACKGROUND

The most recent Yarragon Structure Plan was developed in 2010 and is now outdated. The study area of the previous Plan was expanded, identifying areas in the west, south and east of the existing township for future development.

The current Yarragon Structure Plan at clause 21.04 of the Baw Baw Planning Scheme identifies that investigation areas within the township boundary should be considered to provide residential land supply, providing an indicative timing of post 2026.

In keeping with the current Plan at Clause 21.04 and future residential investigation areas, a Section 96A combined planning permit and planning scheme amendment proposal has been submitted to Council for assessment. This proposal involves a staged, multi lot subdivision of approximately 300 lots on land to the east of the town centre.

The Baw Baw Rural Land Use Review 2020 provides further research regarding considerations for residential growth in Yarragon however, this document has not been adopted by Council. Further recommended investigation to come out of the Baw Baw Rural Land Use Review 2020 was to undertake detailed assessment of the land north of Yarragon to determine the appropriateness of any additional dwellings in this area having regard to issues such as long-term growth and flooding.

The main objective of this project is to establish the strategic framework for future land use and development in the township through the development of the Yarragon Township Plan.

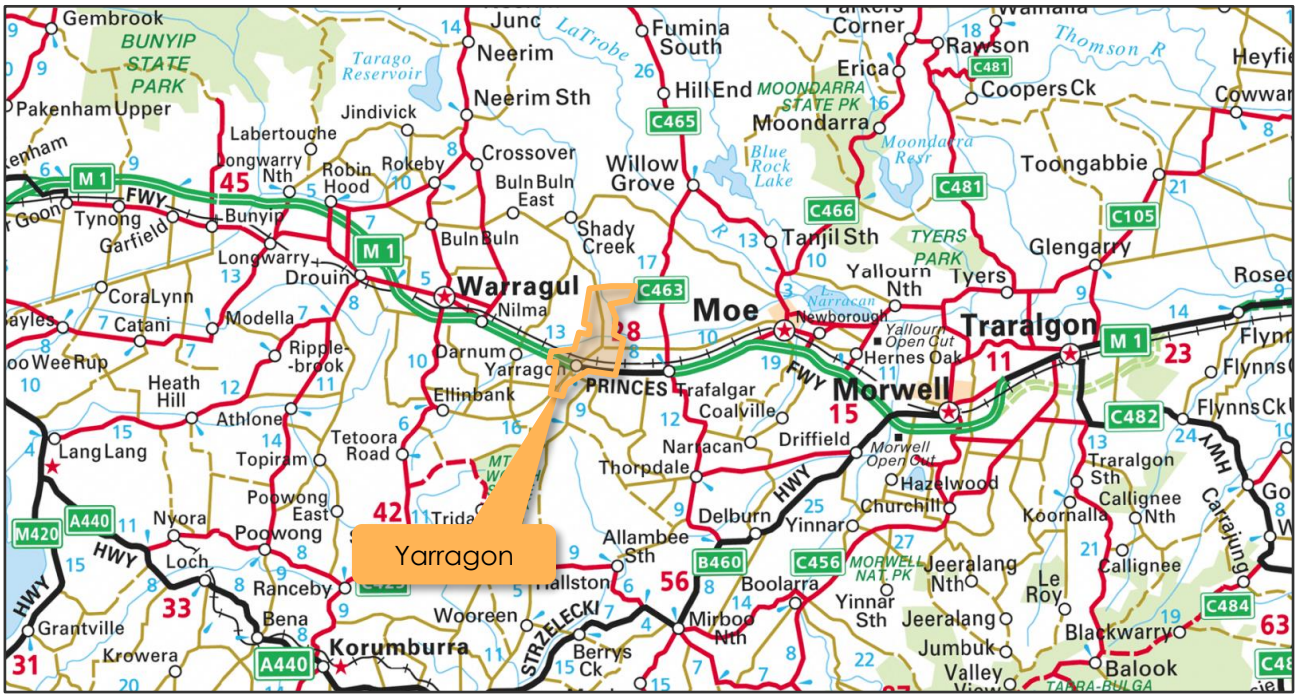
3 EXISTING CONDITIONS

3.1 Location

Yarragon is a regional town located within the Baw Baw Shire in the West Gippsland region of Victoria, approximately 110 kilometres southeast of Melbourne. Yarragon is situated along Princes highway, between Warragul approximately 12 kilometres in the west and Moe approximately 18 kilometres in the east. Smaller towns located within this region are Nilma and Darnum in the west and Trafalgar in the east.

A view of Yarragon's location in relation to surrounding regional towns in provided in Figure 1 below.

Figure 1 Site Location



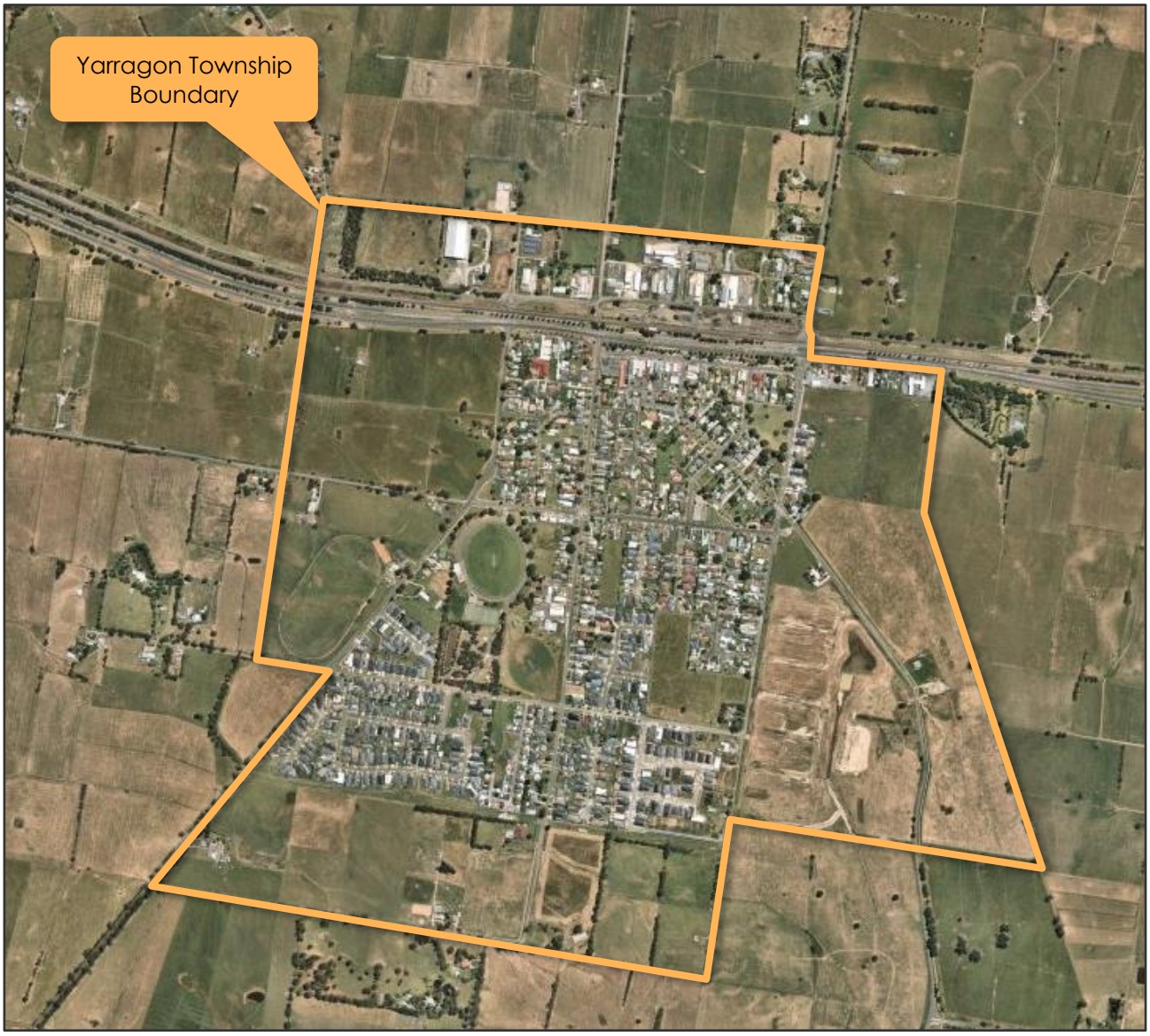
Copyright Melway Publishing

Yarragon is the fourth largest town within the Baw Baw Shire and consists of mostly farmland, with the Yarragon township located toward the south of the town. The Yarragon township is mostly residential land, with recreational facilities and industrial and commercial land. Yarragon also has a strong tourist-oriented shopping destination. Furthermore, Yarragon Primary School and the adjacent Dowton Park Reserve are situated centrally within the township.

Main access to the Yarragon township is from Princes Highway from the west and east. Additional connections to the town are from Hazeldean Road in the southwest, Yarragon-Leongatha Road in the southeast and Yarragon-Shady Creek Road in the northeast.

An aerial view of the Yarragon Township is provided in Figure 2.

Figure 2 Site Context (26 January 2022)



Copyright Nearmap

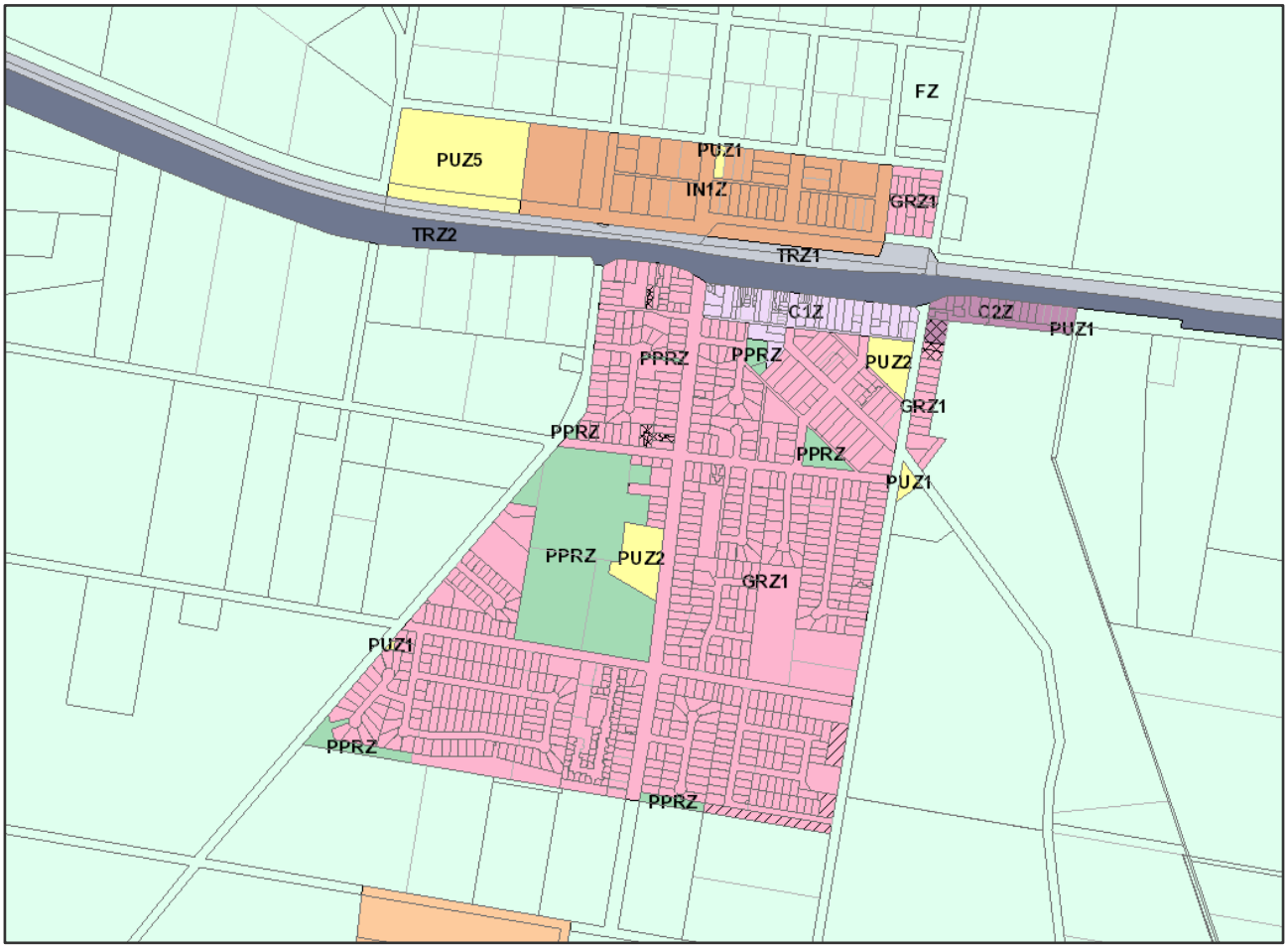
3.2 Planning Zones and Overlays

It is shown in Figure 3 that Yarragon contains land with the following planning zones:

- General Residential Zone (GRZ1).
- Industrial 1 Zone (IN1Z).
- Commercial 1 Zone (C1Z).
- Commercial 2 Zone (C2Z).
- Farming Zone (FZ).
- Public Use Zone (PUZ).
- Public Park and Recreation Zone (PPRZ).

A view of the Planning Scheme Zones within Yarragon is shown in Figure 3 below.

Figure 3 Planning Scheme Zones



Furthermore, Princes Highway is located within a Transport Zone (TZ1); State Transport Infrastructure, and the adjacent railway line is located within a Transport Zone (TZ2); Principal Road Network.

3.3 Road Network

3.3.1 General

Yarragon township is served by an internal road network generally split between the north and the south by Princes Highway and the railway line that runs parallel. Sole access to the north of Princes Highway is via Yarragon-Shady Creek Road in the east of the township, and access to the south is via Hazeldean Road, Loch Street and Rollo Street.

A view of the road network and road hierarchy classification is provided in Figure 4 below, with the road hierarchy sourced from the Baw Baw Shire Public Road Register 2021-2022.

Figure 4 Yarragon Road Network

Copyright Nearmap

3.3.2 Princes Highway

Princes Highway is an arterial road under VicRoads control which is generally the main access road to and from Yarragon. Princes Highway is generally aligned east-west, running between Warragul in the west and Moe in the east. Princes Highway operates with dual traffic lanes in each direction separated by a central grass median throughout the Yarragon township.

A service road runs parallel to the main highway for approximately 480 metres within the Yarragon township, located on the south side of the highway.

This service road offers line marked kerbside parking on both sides of the road, generally restricted to 2P parking on the north side of the road and 1P on the south side. Parking is mixed between parallel and angled parking, with four spaces allocated to motorcycles.

An 80km/h speed limit applies to Princes Highway throughout Yarragon and a 50km/h limit applies to the Princes Highway Service Road.

3.3.3 Hazeldean Road

Hazeldean Road is a local road under Council control located towards the west of Yarragon township and is generally aligned north-south, running between Princes Highway in the north at an unsignalised intersection, and towards Cloverlea for approximately seven kilometres in the south. Within Yarragon between Princes Highway and Market Street, Hazeldean Road provides a single traffic lane in each direction with sealed shoulders on the southbound direction and unsealed shoulders on the northbound side. For the remainder of Hazeldean Road unsealed shoulders are present on both sides of the road.

A 60km/h speed limit applies to Hazeldean Road for the first 500 metres south of Princes Highway and changes to 80km/h for the remaining stretch within Yarragon.

3.3.4 Rollo Street

Rollo Street is a local road under Council control located towards the east of Yarragon township and is generally aligned north-south, running between Princes Highway in the north and terminates approximately 1.1 kilometres in the south. Rollo Street provides a single paved traffic lane in each direction with unsealed shoulders in the southbound direction for the first 730 metres south of Princes Highway. Rollo Street is unsealed for the remainder of the carriageway further south.

Rollo Street intersects with Yarragon – Leongatha Road at an unsignalised cross intersection midway along the road.

The default 50km/h speed limit applies to Rollo Street in the vicinity of the site.

3.3.5 Loch Street

Loch Street is a local road under Council control located towards the centre of Yarragon township and is generally aligned north-south, running between Princes Highway in the north and McIntyre Road approximately two kilometres in the south. Loch Street provides a single paved traffic lane in each direction with sealed shoulders for the first 1,200 metres south of Princes Highway. Loch Street is unsealed for the remainder of the carriageway further south.

The default 50km/h speed limit applies to Loch Street in the vicinity of the site.

3.4 Intersection Volumes

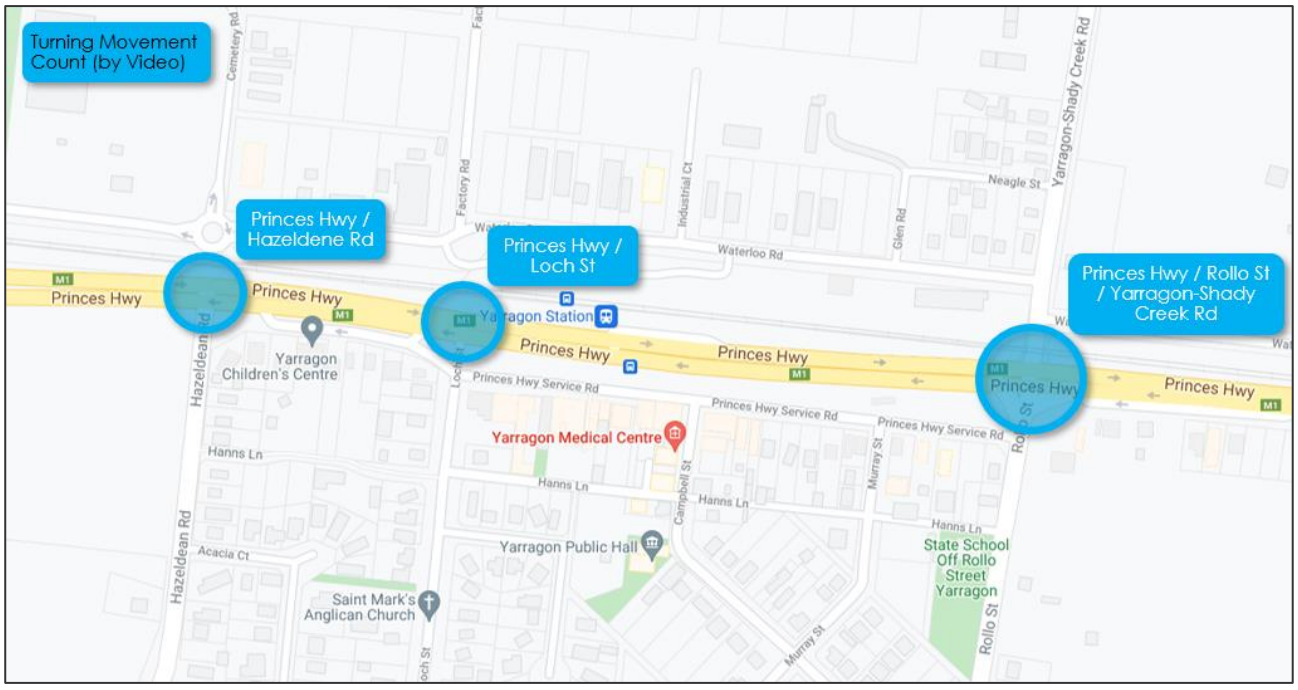
To understand the existing turning movements at the key intersections, **one**mile**grid** commissioned Trans Traffic Surveys to undertake turning movement count surveys on the following day and time as outlined in the below table.

Table 1 Turning Movement Survey Date and Time

Day	*Date*	*Time 1 (inclusive)*	*Time 2 (inclusive)*	*Intervals*
Wednesday	02/03/2022	6:30am – 9:30am	3pm – 6pm	15 minutes
Saturday	05/03/2022	10am – 2pm	N/a	15 minutes

The three intersections surveyed are shown in Figure 5 below.

Figure 5 Turning Movement Survey Locations



The peak hour results for the three intersections, along with an aerial image of the intersection, are shown in Figure 6, Figure 7 and Figure 8 below. The results show the morning and afternoon peak hours for the Wednesday survey on the left and the single peak hour for the Saturday survey on the right.

Figure 6 Existing Traffic Volumes – Princes Highway / Hazeldean Road

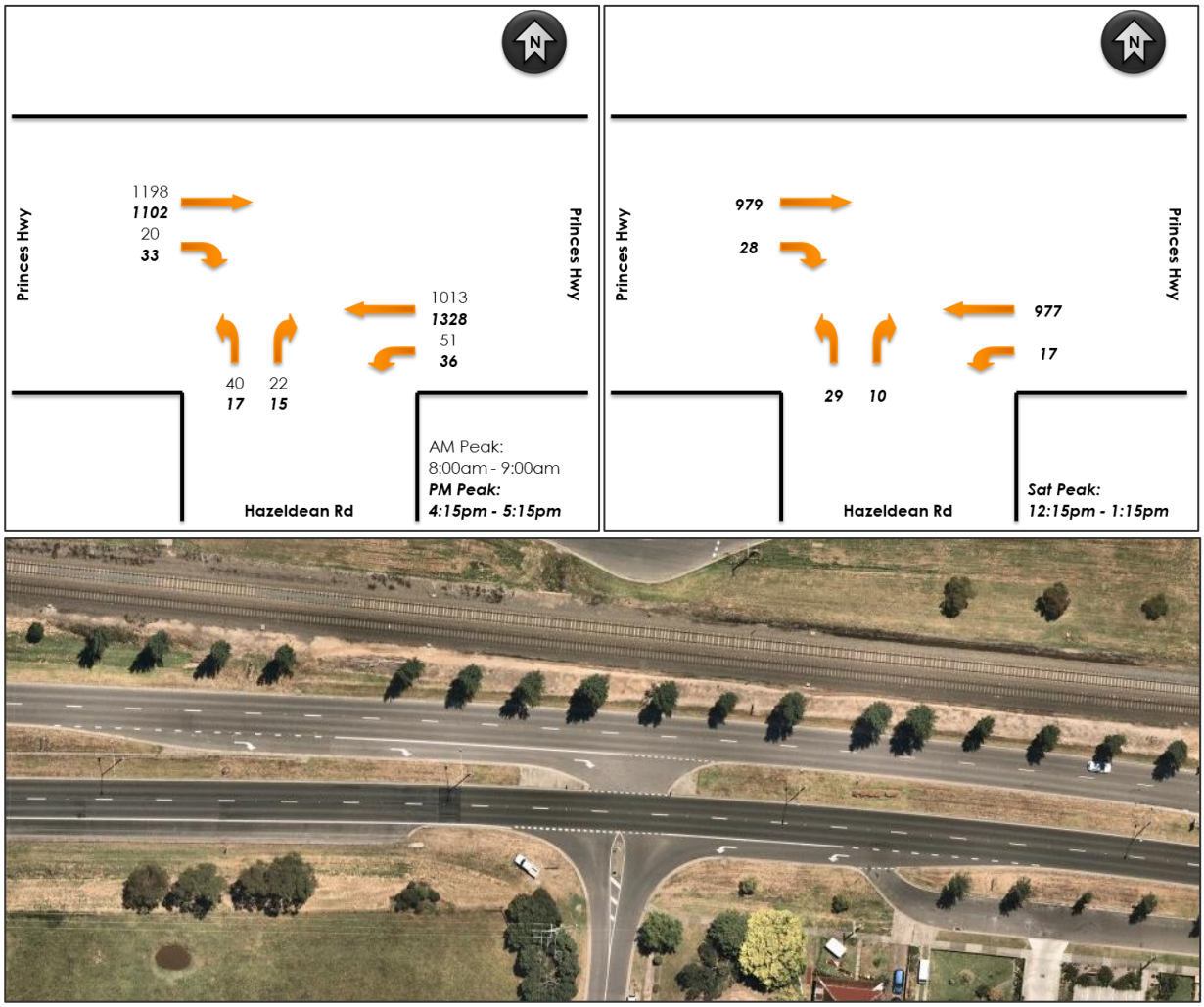


Figure 7 Existing Traffic Volumes – Princes Highway / Loch Street

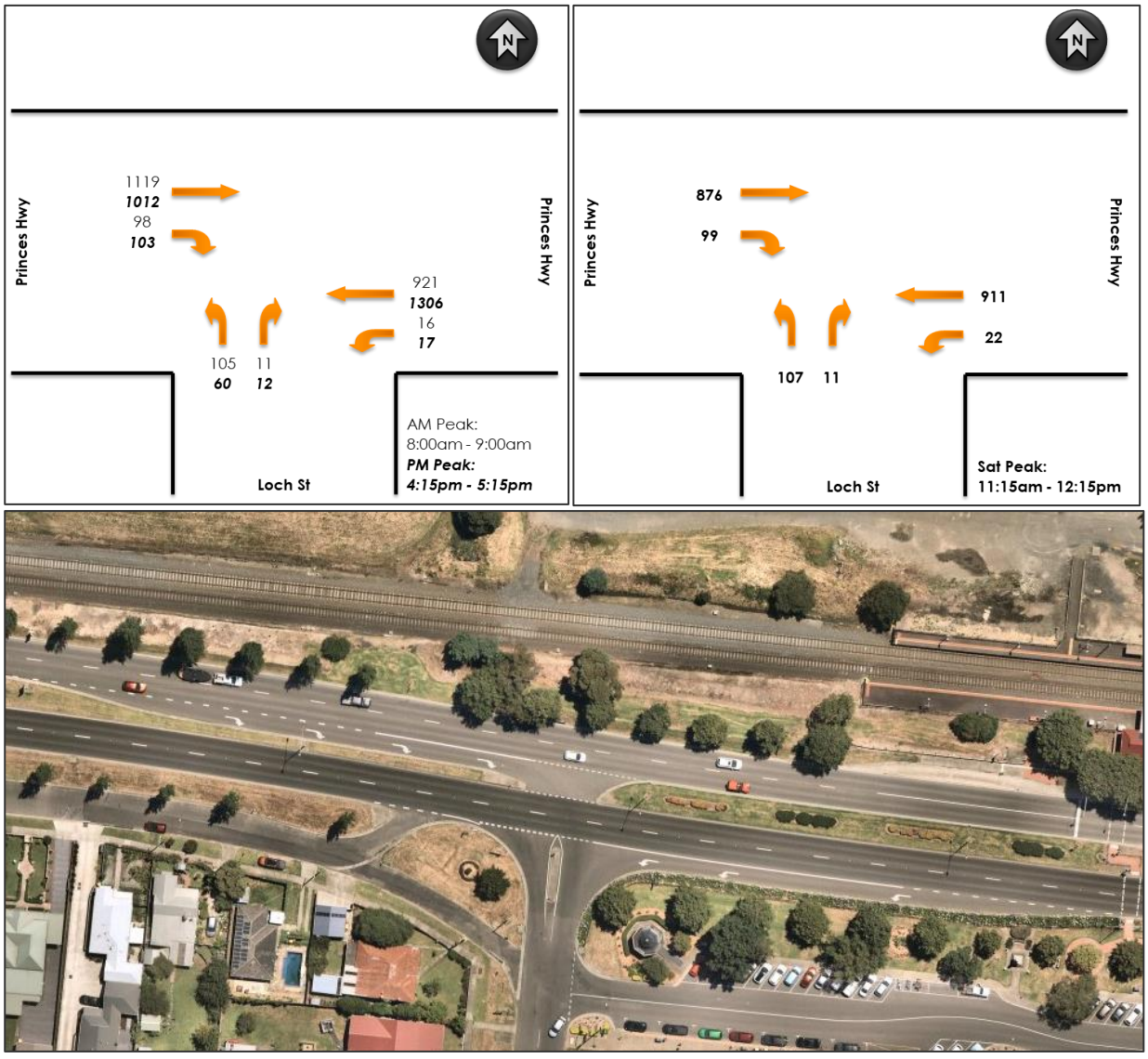
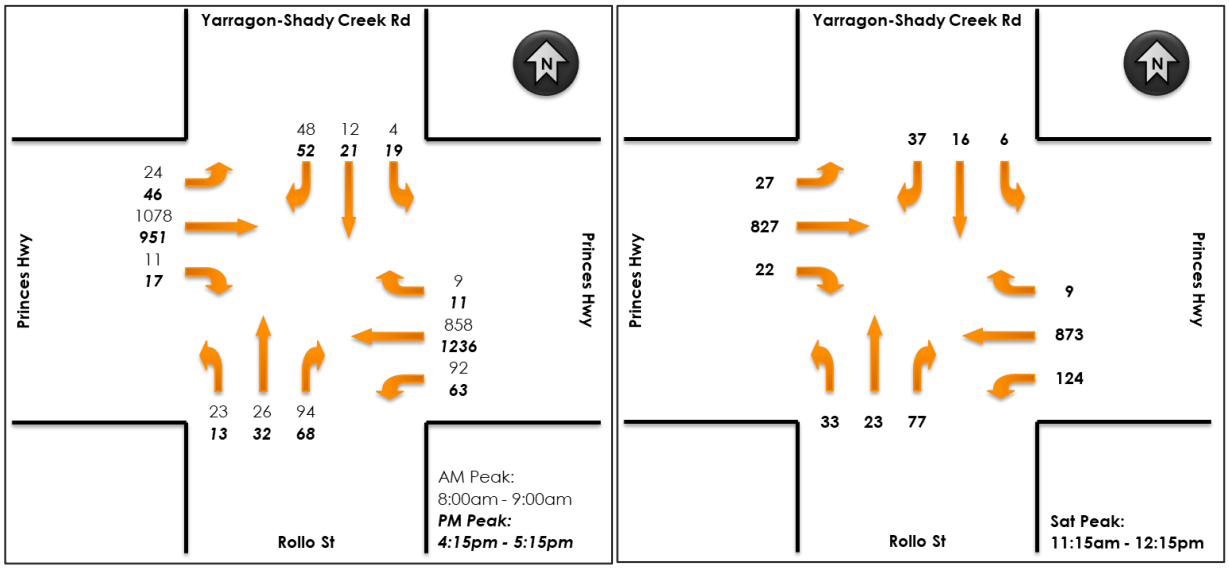


Figure 8 Existing Traffic Volumes – Princes Highway / Rollo Street



3.5 Intersection Operation

To assess the operation of the intersection the traffic volumes have been input into SIDRA Intersection, a traffic modelling software package.

The SIDRA Intersection software package has been developed to provide information on the capacity of an intersection with regard to a number of parameters. Those parameters considered relevant are, Degree of Saturation (DoS), 95th Percentile Queue, and Average Delay as described below.

Table 2 SIDRA Intersection Parameters

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Degree of Saturation (DoS)</td><td>The DoS represents the ratio of the traffic volume making a particular movement compared to the maximum capacity for that particular movement. The value of the DoS has a corresponding rating depending on the ratio as shown below.
<table>
<tr><th>Degree of Saturation</th><th>Rating</th></tr>
<tr><td>Up to 0.60</td><td>Excellent</td></tr>
<tr><td>0.61 – 0.70</td><td>Very Good</td></tr>
<tr><td>0.71 – 0.80</td><td>Good</td></tr>
<tr><td>0.81 – 0.90</td><td>Fair</td></tr>
<tr><td>0.91 – 1.00</td><td>Poor</td></tr>
<tr><td>Above 1.00</td><td>Very Poor</td></tr>
</table>
It is noted that whilst the range of 0.91 – 1.00 is rated as ‘poor’, it is acceptable for critical movements at an intersection to be operating within this range during high peak periods, reflecting actual conditions in a significant number of suburban signalised intersections.</td></tr>
<tr><td>Average Delay (seconds)</td><td>Average delay is the time delay that can be expected for all vehicles undertaking a particular movement in seconds.</td></tr>
<tr><td>95th Percentile (95%ile) Queue</td><td>95%ile queue represents the maximum queue length in metres that can be expected in 95% of observed queue lengths in the peak hour</td></tr>
</table>

The results of the analysis are provided in Table 3 – Table 5 below.

Table 3 Princes Highway / Hazeldean Road – Existing Conditions

Approach	*Movement*	*DoS*	*Rating*	*Avg. Delay (sec)*	*Queue (m)*
Wednesday AM Peak (8am – 9am)					
Hazeldean Road (s)	Left	0.05	Excellent	11	1
	Right	0.20	Excellent	52	2
Princes Highway (e)	Left	0.03	Excellent	6	0
	Through	0.28	Excellent	0	0
Princes Highway (w)	Through	0.33	Excellent	0	0
	Right	0.07	Excellent	18	1
Wednesday PM Peak (4:15pm – 5:15pm)					
Hazeldean Road (s)	Left	0.03	Excellent	13	1
	Right	0.34	Excellent	119	8
Princes Highway (e)	Left	0.02	Excellent	6	0
	Through	0.36	Excellent	0	0
Princes Highway (w)	Through	0.30	Excellent	0	0
	Right	0.21	Excellent	31	5
Saturday Peak (12:15pm – 1:15pm)					
Hazeldean Road (s)	Left	0.04	Excellent	11	1
	Right	0.08	Excellent	43	2
Princes Highway (e)	Left	0.01	Excellent	6	0
	Through	0.27	Excellent	0	0
Princes Highway (w)	Through	0.27	Excellent	0	0
	Right	0.09	Excellent	16	2

Table 4 Princes Highway / Loch Street – Existing Conditions

Approach	*Movement*	*DoS*	*Rating*	*Avg. Delay (sec)*	*Queue (m)*
Wednesday AM Peak (8am – 9am)					
Loch Street (s)	Left	0.13	Excellent	11	2
	Right	0.09	Excellent	44	1
Princes Highway (e)	Left	0.01	Excellent	6	0
	Through	0.25	Excellent	0	0
Princes Highway (w)	Through	0.31	Excellent	0	0
	Right	0.28	Excellent	17	3
Wednesday PM Peak (4:15pm – 5:15pm)					
Loch Street (s)	Left	0.10	Excellent	13	3
	Right	0.29	Excellent	119	7
Princes Highway (e)	Left	0.01	Excellent	6	0
	Through	0.36	Excellent	0	0
Princes Highway (w)	Through	0.28	Excellent	0	0
	Right	0.61	Very Good	43	17
Saturday Peak (12:15pm – 1:15pm)					
Loch Street (s)	Left	0.14	Excellent	11	4
	Right	0.09	Excellent	42	2
Princes Highway (e)	Left	0.01	Excellent	6	0
	Through	0.25	Excellent	0	0
Princes Highway (w)	Through	0.24	Excellent	0	0
	Right	0.28	Excellent	17	8

Table 5 Princes Highway / Rollo Street / Yarragon-Shady Creek Road – Existing Conditions

Approach	Movement	DoS	Rating	Avg. Delay (sec)	Queue (m)
Wednesday AM Peak (8am – 9am)					
Rollo Street (s)	Left	0.13	Excellent	30	14
	Through	0.13	Excellent	25	14
	Right	0.43	Excellent	69	48
Princes Highway (e)	Left	0.38	Excellent	15	98
	Through	0.38	Excellent	10	109
	Right	0.13	Excellent	84	5
Yarragon-Shady Creek Road (n)	Left	0.05	Excellent	62	7
	Through	0.05	Excellent	56	7
	Right	0.22	Excellent	66	23
Princes Highway (w)	Left	0.02	Excellent	14	4
	Through	0.43	Excellent	11	131
	Right	0.16	Excellent	85	6
Wednesday PM Peak (4:15pm – 5:15pm)					
Rollo Street (s)	Left	0.20	Excellent	37	14
	Through	0.20	Excellent	32	14
	Right	0.48	Excellent	78	37
Princes Highway (e)	Left	0.48	Excellent	14	138
	Through	0.48	Excellent	8	143
	Right	0.16	Excellent	85	6
Yarragon-Shady Creek Road (n)	Left	0.12	Excellent	67	13
	Through	0.43	Excellent	66	34
	Right	0.43	Excellent	75	34
Princes Highway (w)	Left	0.04	Excellent	11	7
	Through	0.36	Excellent	8	71
	Right	0.24	Excellent	85	10
Saturday Peak (12:15pm – 1:15pm)					
Rollo Street (s)	Left	0.14	Excellent	26	15
	Through	0.14	Excellent	21	15
	Right	0.38	Excellent	70	39
Princes Highway (e)	Left	0.39	Excellent	13	96
	Through	0.39	Excellent	9	112
	Right	0.13	Excellent	84	5
Yarragon-Shady Creek Road (n)	Left	0.06	Excellent	63	7
	Through	0.21	Excellent	59	21
	Right	0.21	Excellent	67	21
Princes Highway (w)	Left	0.02	Excellent	13	4
	Through	0.33	Excellent	10	87
	Right	0.32	Excellent	86	13

3.6 Crash History

Crash history information for town of Yarragon was obtained through the Department of Transport (VicRoads) CrashStats (the Victorian accident statistics and mapping program) for the latest available 5-year period (2014 – 2019 inclusive).

A total of 2 crashes were recorded over the 5-year period, with the crash locations highlighted in Figure 9 and summarised in Table 6.

Figure 9 Yarragon Crash Locations

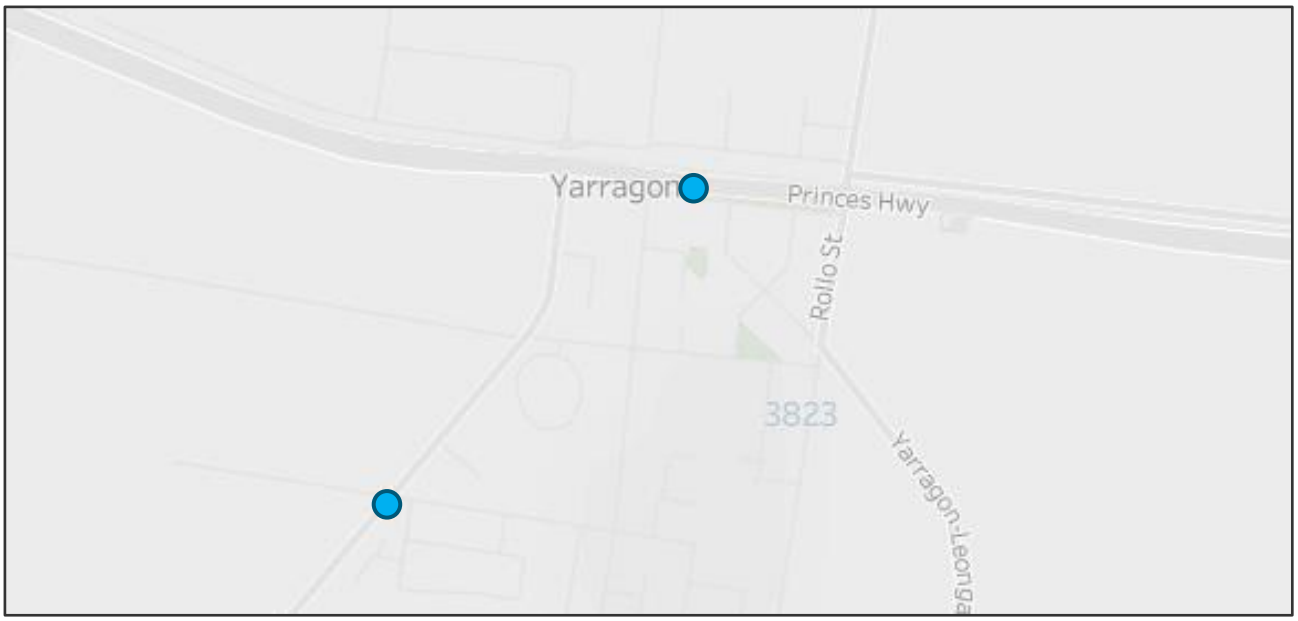


Table 6 Crash Data Summary – Yarragon

Road	Date / Time	Accident Type	Description	Severity
Princes Highway	15 May 2014 10:35 AM	Struck Pedestrian	Pedestrian hit vehicle from the left	Serious Injury
Hazeldean Road	2 April 2014 8:05 PM	Struck Animal	Struck Animal	Serious Injury

The data indicates that neither accident that occurred involved vehicle collisions, and both involved a serious injury. No accidents have involved a fatality over the recorded five-year period.

3.7 Car Parking

A number of commercial and Council on-street and off-street car parking is located in close proximity to the Yarragon Activity Centre, as indicated in Figure 10, containing in excess of 280 spaces.

Figure 10 Car Parking Locations

Copyright Nearmap

A car parking study was undertaken over several days in December 2015 by the Baw Baw Shire Council, which assessed the occupancy of all on-street and off-street parking within this area and several on-street parking beyond. The surveys concluded a 58% peak occupancy rate within the survey area, which occurred on a Friday at 12pm. A higher demand for short term parking along Princes Highway Service Road was observed due to this area catering for a large number of tourists.

The area of the study and associated parking restrictions are provided below in Figure 11.

Figure 11 Baw Baw Council Parking Study

3.8 Sustainable Transport

3.8.1 Public Transport

Public transport within Yarragon is limited to train and bus services which are accessible from Yarragon Railway station, located to the north of Yarragon Township via the eastbound lane of Princes Highway.

Yarragon Station offers V-line train services between Melbourne and Bairnsdale, with 3-5 services per weekday and 2-3 services per weekend in each direction.

Several bus routes operate through Yarragon including Drouin – Traralgon, Drouin – Moe, Moe – Garfield, and Warragul – Moe. Each of these services generally operate once per day.

An extract of the Eastern Victoria train and coach network is provided in Figure 12.

The bus routes which operate through Yarragon Township are show in Figure 13.

Figure 12 East Victorian Tran and Coach Network

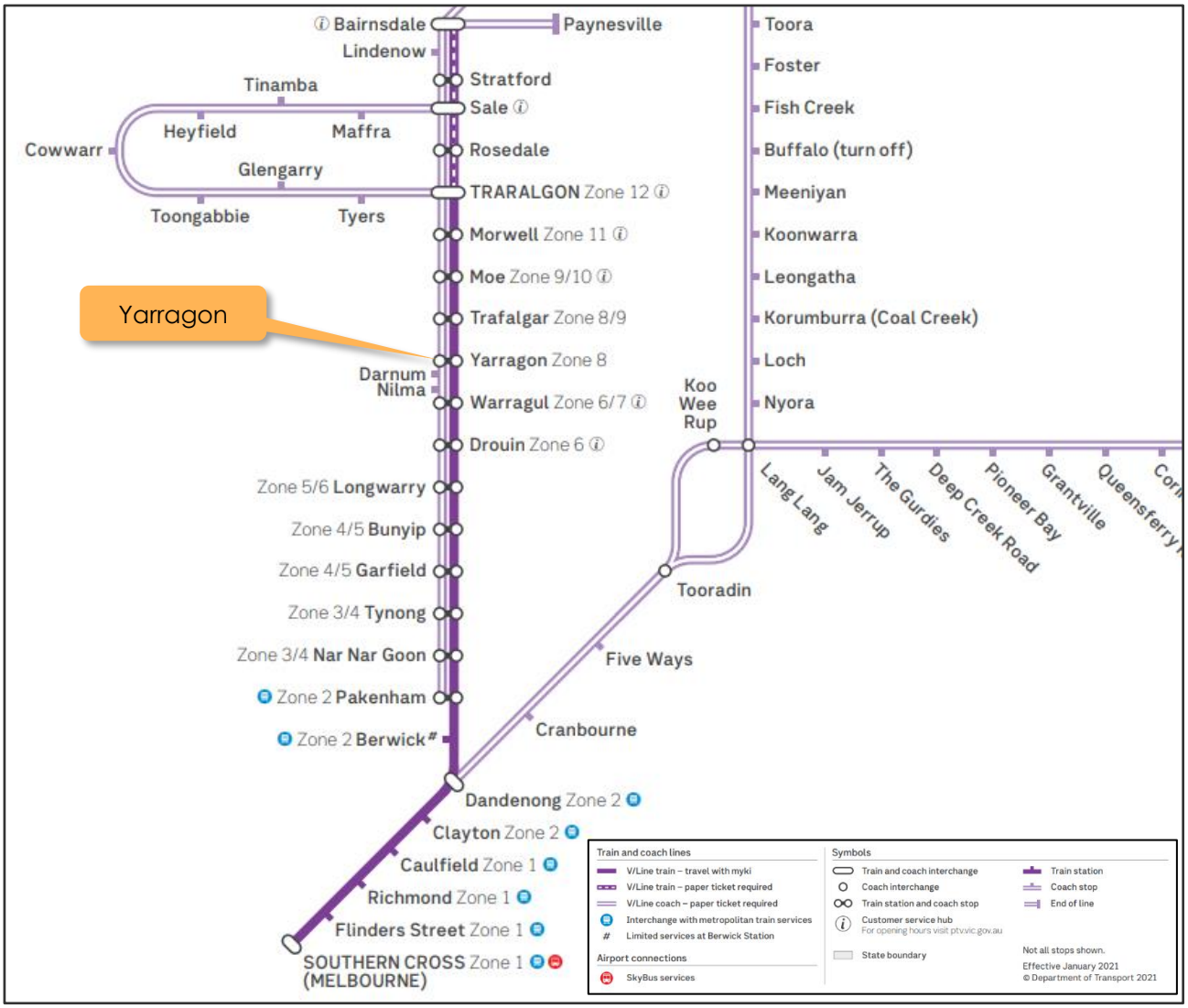
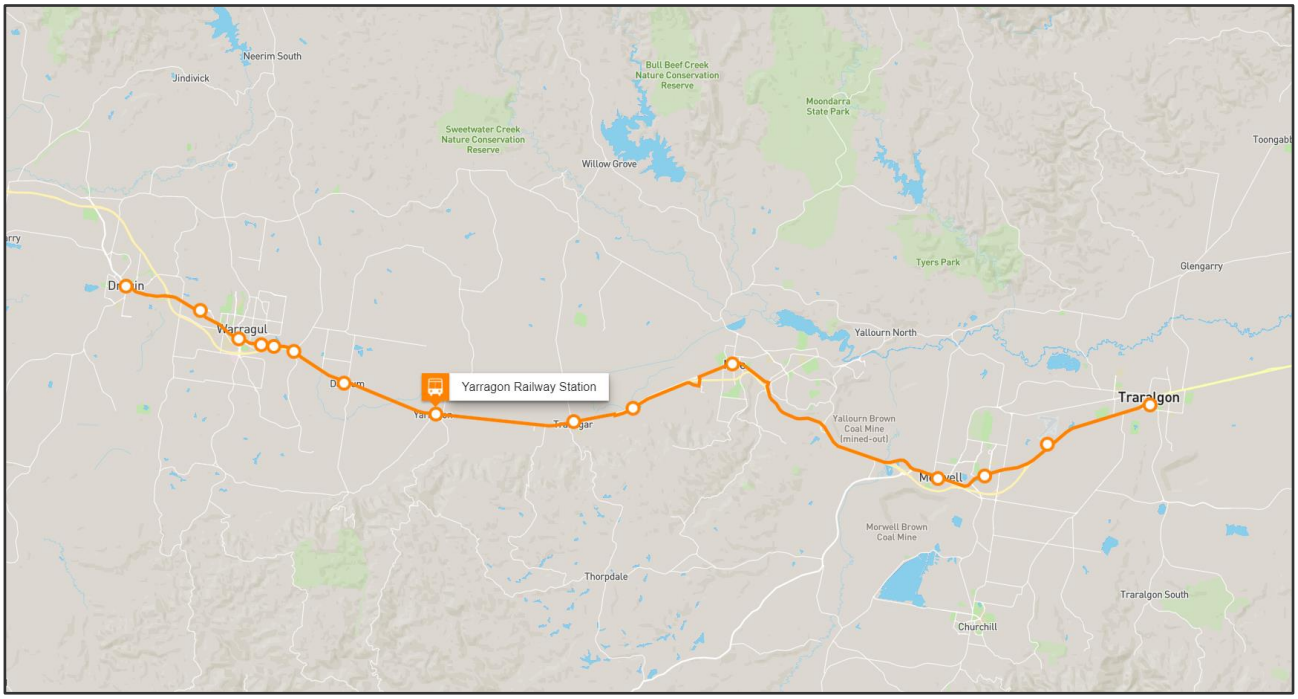


Figure 13 Yarragon Township Bus Routes



3.8.2 Bicycle Facilities

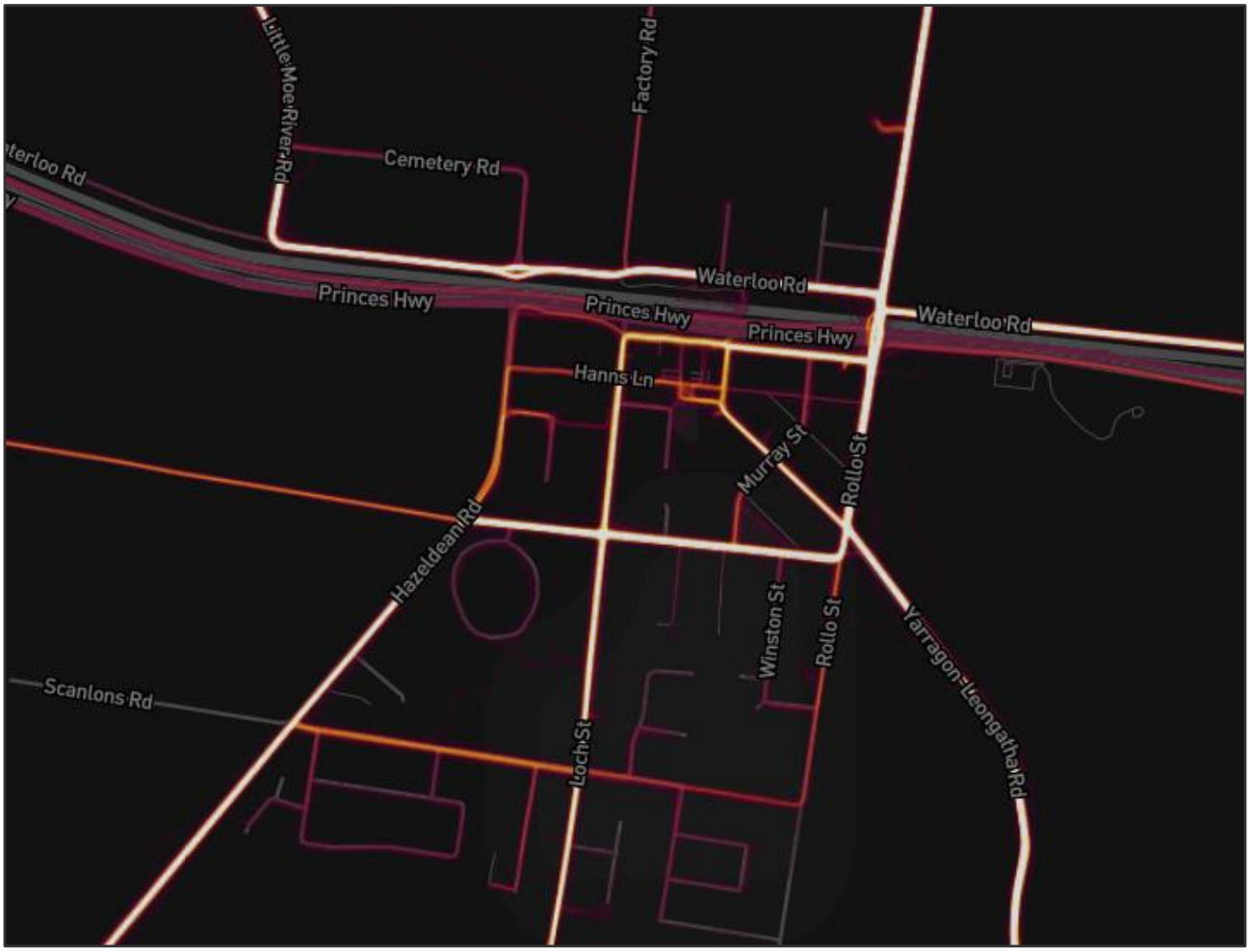
While no formal bicycle lanes are located within Yarragon Township, shared roads are located throughout Yarragon that are usable by both vehicles and cyclists. Highly utilised roads by cyclists has been sourced via the 'Strava Global Heatmap' tool to provide an indication of the key cycling routes.

Strava is a social network and training tool for cyclists, runners and swimmers. Users record their physical activity using a dedicated GPS device or utilise the mobile app, and upload the file to their profile.

Strava anonymised this information and makes it available through their "Global Heatmap" tool, showing aggregated all public activities over the last two years across the world.

A view of the cycling heatmap in proximity to the study area is provided below in Figure 14. Routes of higher usage are brighter in colour.

Figure 14 Strava Cycling Heatmap



As shown above, primary routes in and out of the study area comprise:

- Hazeldean Road
- Yarragon-Leongatha Road
- Market Street
- Yarragon-Shady Creek Road and the northern end of Rollo Street
- Waterloo Road
- Little Moe River Road

It is noted that this information includes all cycling activities recorded on the platform, inclusive of weekend trips, and all trips throughout the day. Additionally, the data is skewed towards sports cyclists, given that the bulk of commuter and recreational cyclists will not be tracking their rides.

3.8.3 Pedestrian Accessibility

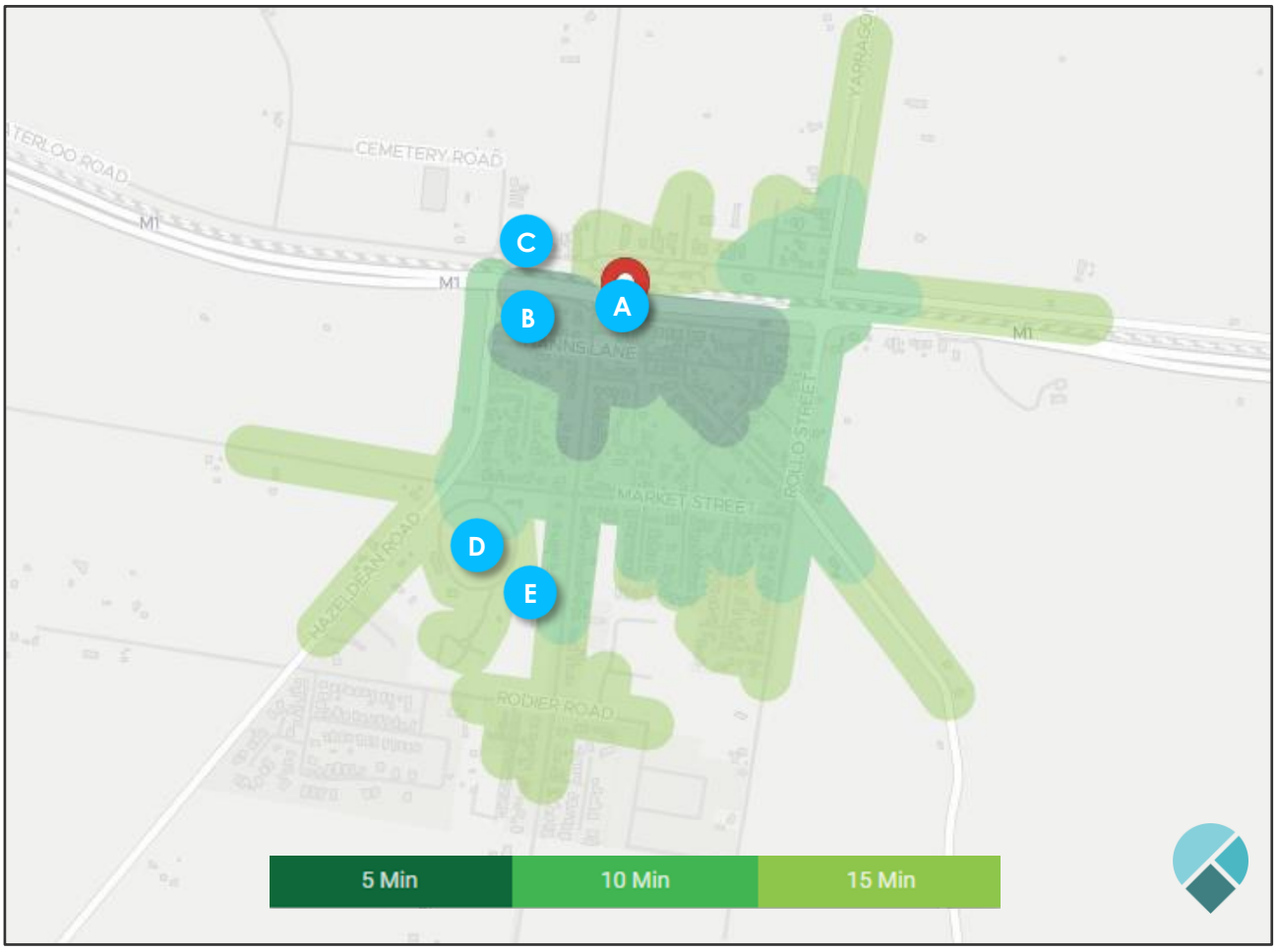
Yarragon has an off-road pedestrian path network providing safe and easy connectivity throughout Yarragon Township. An extract of the Baw Baw Paths and Trails Strategy (2019) is provided below, showing the pedestrian footpath network throughout Yarragon Township.

Figure 15 Yarragon Pedestrian Footpath Network

As shown above, a large portion of residential land and commercial services within Yarragon Township are within walking distance from the activity centre.

Figure 16 shows a pedestrian walk time map from the Yarragon Activity Centre, with the major facilities in the vicinity of the site identified in Table 7.

Figure 16 Pedestrian Walk-Time Map



Courtesy of Targomo

Table 7 Nearby Facilities

Ref	Facility	Approx. Distance
A	Yarragon Railway Station / Yarragon Station Bus Stop	< 100m
	Yarragon Village Supermarket	
	Yarragon Bakery	
	Yarragon Hotel	
	Yarragon Medical Centre	
	Yarragon LPO	
B	Yarragon Children's Centre	220m
C	Yarragon Vintage Market	400m
D	Yarragon Primary School	660m
E	Dowton Park Reserve and Playground	680m

3.9 Yarragon Structure Plan

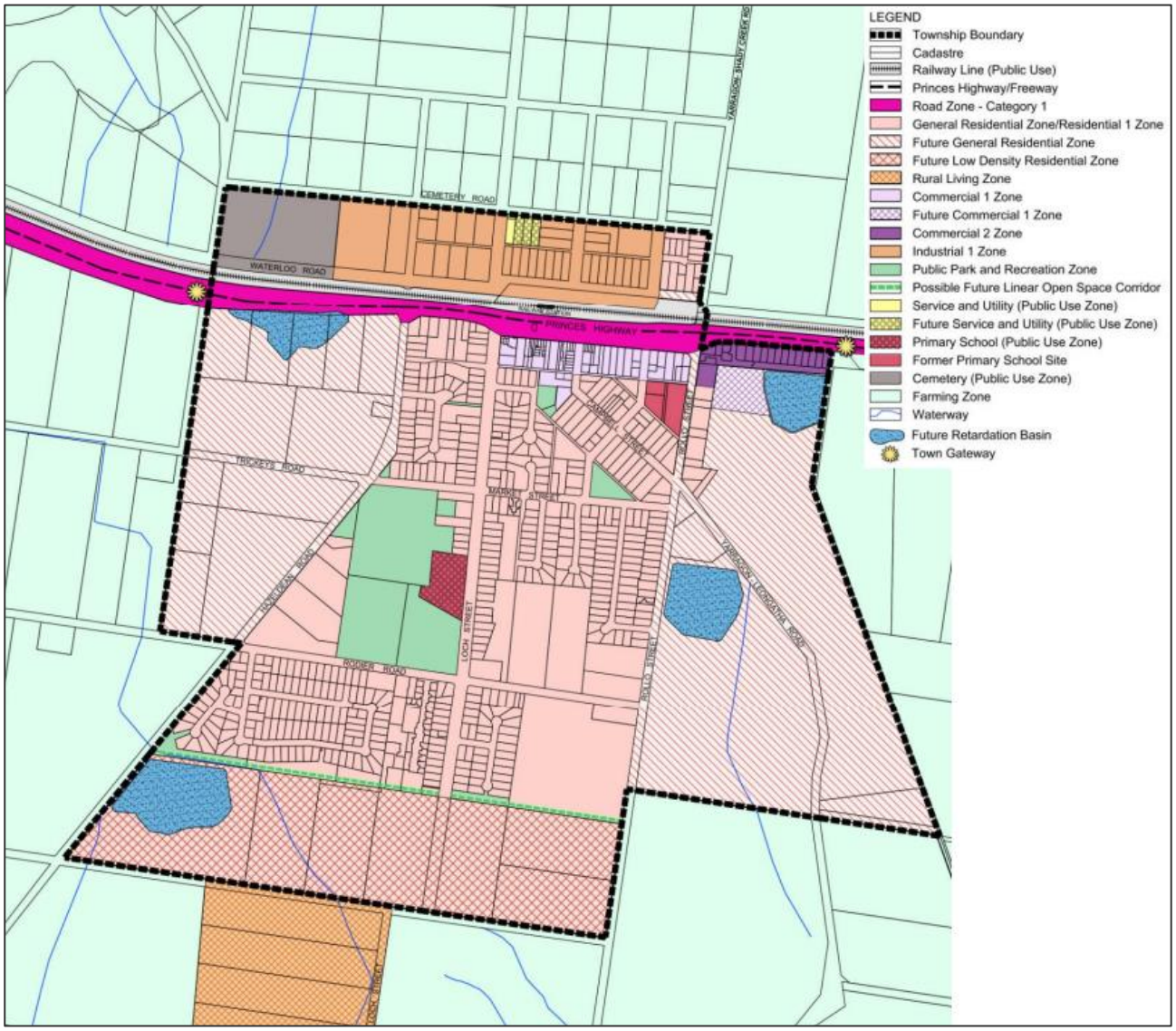
The existing Yarragon Structure Plan, developed in 2014, forms part of the Baw Baw Planning Scheme (Clause 21.04) and aims to develop sustainable communities through a settlement framework offering convenient access to jobs, services, infrastructure and community facilities.

The following strategies within the planning scheme are specific to Yarragon:

- Direct residential growth in Yarragon to the south of the Princes Freeway as follows:
  - West - Standard residential densities
  - East - A mix of uses and housing forms
  - South – Low density lifestyle housing
- Support a distinct boundary between urban and rural land, including use of buffer planting or linear parks;
- Encourage housing forms to respect the rural character of the township;
- Encourage infill residential and mixed use development within the existing township boundary;
- Support medium density residential and mixed-use development close to commercial centres and community facilities and the train station;
- Enhance town gateways at the eastern and western entrances to Yarragon;
- Encourage increased densities for properties fronting Campbell Street;
- Encourage consolidation of commercial and industrial uses;
- Encourage existing residential properties in the Commercial 1 Zone to redevelop for commercial uses;
- Direct industrial growth to the north of the railway line;
- Encourage Yarragon as a centre for manufacturing and service industries; and
- Support bulky goods retailing in Yarragon in the Commercial 2 Zone land fronting the Princes Freeway east of Rollo Street.

An overview of the Yarragon Structure Plan is provided below in Figure 17.

Figure 17 Yarragon Structure Plan



As shown above, a large portion of land currently occupied by rural residential land is planned to be developed into standard residential and low-density residential land. This is estimated to add hundreds of residential dwellings to the township.

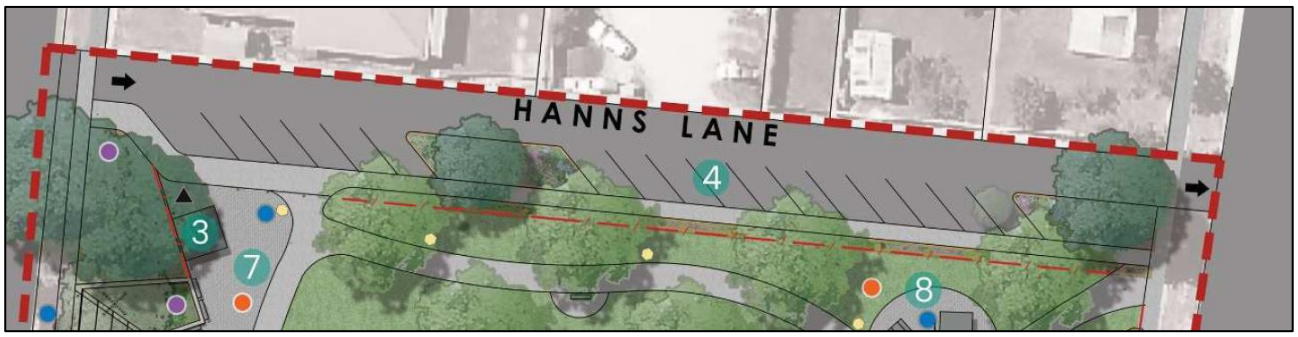
4 HANNS LANE

According to Councils website, Baw Baw Shire Council has adopted the Rollo Street Reserve Masterplan in December 2021, which is a planning document to guide the future development of the site at 3-5 Rollo Street, Yarragon. The masterplan was prepared in consultation with the Yarragon community and is shown in Figure 18.

Of particular note, the masterplan identifies an opportunity for new angled parking in Hanns Lane, converting the lane to operate one-way from west to east and paving the laneway, magnified in Figure 19.

Figure 18 Rollo Street Reserve Masterplan

Figure 19 Rollo Street Reserve Masterplan – Hanns Lane



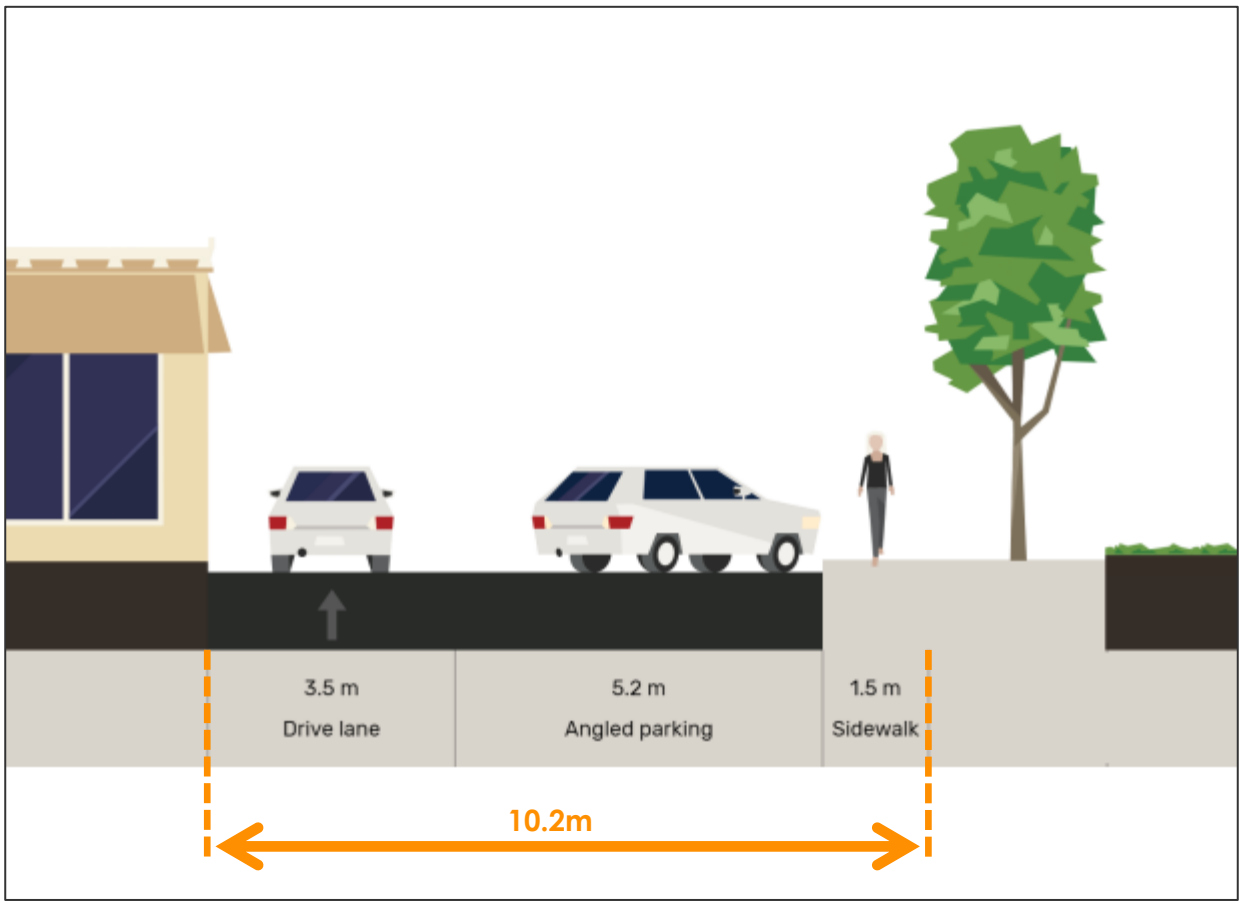
Hanns Lane between Rollo Street and Murray Street currently operates as a two-way rear laneway that provides access to several commercial lots that operate along Princes Highway Service Road. Hanns Lane measures approximately 5.3-metres-wide between Rollo Street and Murray Street and is located directly adjacent Rollo Reserve.

As mentioned, an opportunity has been identified for new angled parking in Hanns Lane, converting the lane to operate one-way from west to east and paving the laneway. **one**mile**grid** has prepared a potential cross section for Hanns Lane, utilising Streetmix, an online road cross section building website.

The potential Hanns Lane cross section would measure a total width of 10.2-metres; consisting of a 3.5m-wide one-way traffic lane (west to east), 5.2m-wide angled parking lane facing the direction of travel and a 1.5m-wide footpath. A view of the cross section is provided in Figure 20 below.

IT is noted that several other variations of the cross section could be designed to achieve a similar outcome, and that angled parking could be broken up with kerb outstands either periodically or in strategic locations to provide greater landscaping and retain existing trees.

Figure 20 Potential Hann Lane Cross Section (looking east)



Made with Streetmix

5 DEVELOPMENT WITHIN YARRAGON TOWNSHIP

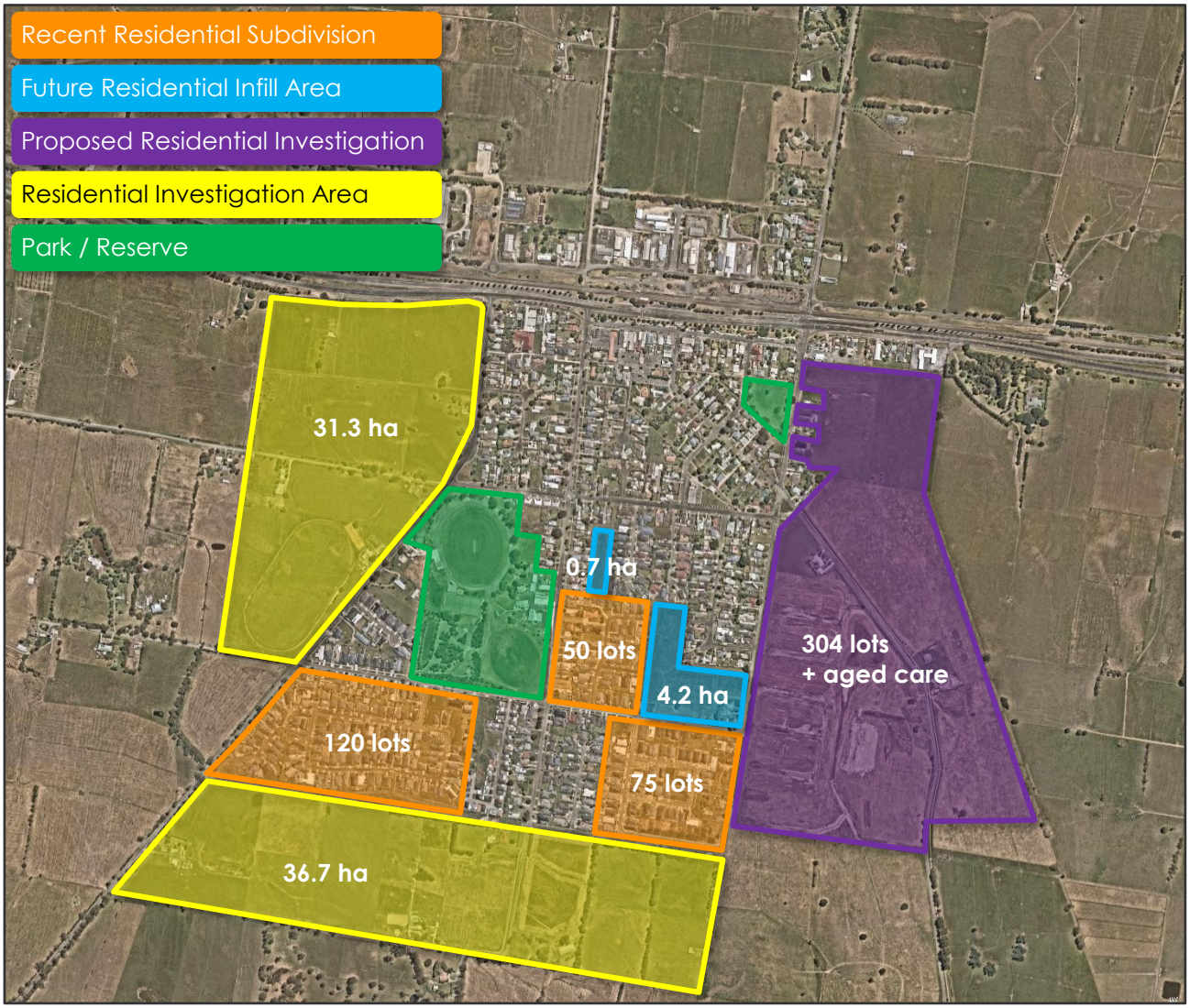
Yarragon is currently experiencing significant population growth, with the Yarragon – Darnum – Nilma area expected to grow by approximately 57% by 2041. This is evident within Yarragon, with several subdivisions throughout the township constructed over the past eight years. Furthermore, approximately 45 hectares of farming land in the eastern portion of the township has been proposed to be rezoned for residential purposes and subdivided into 304 residential lots (plus one lor for aged care).

Several new park and reserve upgrades are also proposed within Yarragon, including Dowton Park and 3-5 Rollo Street. It is proposed to increase the amenity of Dowton Park including a new car park, upgrades to the existing pavilion, and an improvement to pedestrian connectivity. 3-5 Rollo Street is currently green open space with the possibility of being upgraded to include an internal path network and garden areas.

In addition, there is also two large portions of land to the south and west of the township that are flagged as residential investigation areas for potential future development. The current Yarragon Structure plan is shown at 21.04 of the Baw Baw Planning Scheme

A view of new subdivisions over the past eight years and any potential future developments are shown below in Figure 21. It should be noted that all figures relating to number of lots and area measurements are approximate.

Figure 21 Existing and Planned Development Within Yarragon Township



Copyright Nearmap

The proposed residential investigation area and subdivision of the land to the east of the township (purple area shown in Figure 21 above) was accompanied by a Traffic Impact Assessment Report prepared by O'Brien Traffic (dated 19 March 2021, ref: 18929). The report detailed the proposed development design and layout, with the site proposing an approximate 50% land utilisation for residential lots and the provision for a 3.2-hectare superlot marked for a possible aged care facility or lifestyle village. The report also demonstrated that of the land utilised for residential lots, a yield of 12 lots per hectare was achieved (304 lots over 24.06 hectares) with an average lot size of 792 square metres.

Applying the same residential lot land utilisation to the residential investigation areas, as well as applying the same lot yield to the residential infill areas and the residential investigation areas provides a projection into the future residential development of the Yarragon Township.

Based on the above, a breakdown of the potential future residential development is outlined in Table 8 below.

Table 8 Potential Future Residential Development

Area	*Area*	*Lots*
Residential Infill Areas	4.9 ha (approx.)	58
Proposed Residential Investigation Area (east)	24.06 ha	304
Residential Investigation Areas (south & west)	*34 ha (approx.)	408
Total		**770 lots**

**50% land utilisation for residential lots.*

As previously outlined, there was also provision for non-residential land uses in the proposed residential investigation area to the east of the township. It is assumed that roughly some portion of the land (7% of total land) in the western residential investigation area will be utilised for non-residential land uses, whilst the position of the south investigation area does not lend itself to non-residential land uses and therefore non-residential land uses will not be considered in this area for the purposes of this analysis.

Based on the above, a breakdown of the potential future non-residential development is outlined in Table 9 below.

Table 9 Potential Future Non-Residential Development

Area	*Land Use*	*Area*
Proposed Residential Investigation Area (east)	Aged Care	3.2 ha
Residential Investigation Area (west)	Commercial	*2.2 ha (approx.)

**7% of total land.*

6 TRAFFIC

6.1 Traffic Generation

6.1.1 Residential

It is generally accepted that single dwellings on a lot in outer suburban and regional areas may generate traffic at up to 10 vehicle trips per day, whilst in areas with good public transport, and for higher density dwellings, lower traffic generation rates are often recorded.

Considering the location of the Yarragon Township and the likely low-density nature of the future residential development, it is reasonable to assume a daily rate of in the order of 10 movements per day per dwelling with 10% occurring during the peak hours.

It should be noted that this assumption is in line with the traffic generation rates adopted in the O'Brien's Traffic Impact Assessment for proposed residential investigation area to the east (63 Yarragon-Leongatha Road, Yarragon).

In regard to the inbound and outbound split of vehicles during the peak hours, the typical distribution of traffic observed by residential subdivision is outlined in Table 10 below.

Table 10 Residential Traffic Distribution - Subdivision

Peak Hour	*Percentage of Daily*	*Inbound*	*Outbound*
Weekday AM Peak	10%	30%	70%
Weekday PM Peak	10%	60%	40%
Weekend Peak	10%	50%	50%

Based on the above, the anticipated traffic generated by the potential future residential development within the Yarragon Township is shown in Table 11 below.

Table 11 Anticipated Traffic Generation – Weekday

Time	*Inbound (vehicles)*	*Outbound (vehicles)*	*Total (vehicles)*
AM Peak	231	539	770
PM Peak	462	308	770
Daily	3,850	3,850	7,700

6.1.2 Non-Residential

Aged Care / Lifestyle Village

The O'Brien's Traffic Impact Assessment Report states that aged care facilities and lifestyle villages typically do not generate significant amount of traffic at peak on-road times. This is considered reasonable and will be adopted for the purposes of the following analysis.

Commercial

It is typically seen that for commercial uses, traffic generation during the commuter peak hours are by staff who arrive in the morning peak and depart in the evening peak. However, it is assumed that the majority of staff/workers at any new commercial developments in the township area will also reside in the area and therefore their traffic generation has already been accounted for in the residential traffic generation rates.

To avoid double counting any traffic movements, no additional traffic generation will be added for the potential commercial development in the area.

6.2 Traffic Distribution

The O'Brien's Traffic Impact Assessment Report assumed that 95% of vehicle movements to and from the residential subdivision to the east would occur via north (Princes Highway / Rollo Street intersection). This assumption has been applied to the other potential residential developments within the Yarragon Township previously identified.

Considering the location of each site in relation to the arterial road network, traffic generated by each potential future development site has been distributed to the three intersections surveyed to travel either east or west along Princes Highway. The majority of vehicles heading east will utilise the signalised intersection at Rollo Street for outbound trips, whereas all other vehicle trips will primarily use the intersection in closest proximity to its origin / destination.

The wider road network distribution has been based on the existing turning movements at each of the intersections along Princes Highway, shown in Table 12 below.

Table 12 Adopted Directional Traffic Distribution along Princes Highway

Origin/Destination	*Percentage*
East	40%
West	60%

6.3 Generated Traffic Volumes

Based on the above, the following traffic volumes are expected to be generated by the future residential development at the intersections along Princes Highway, as shown in Figure 22 – Figure 24 below.

Figure 22 Generated Traffic Volumes – Princes Highway / Hazeldean Road

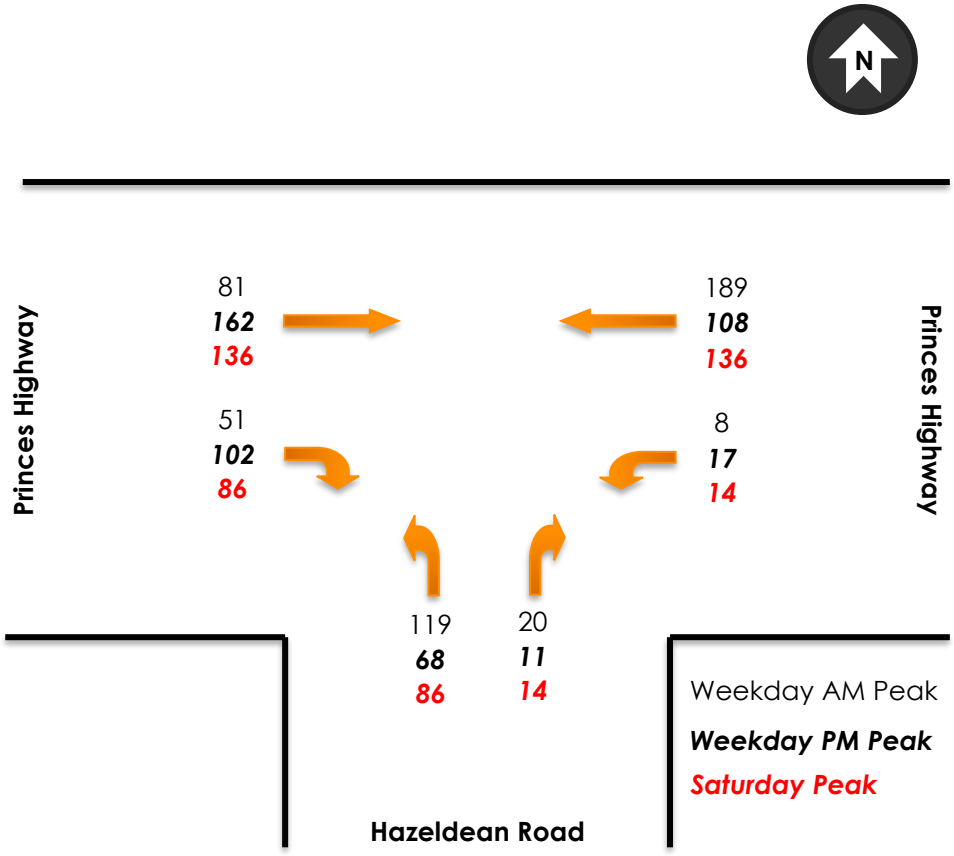


Figure 23 Generated Traffic Volumes – Princes Highway / Loch Street

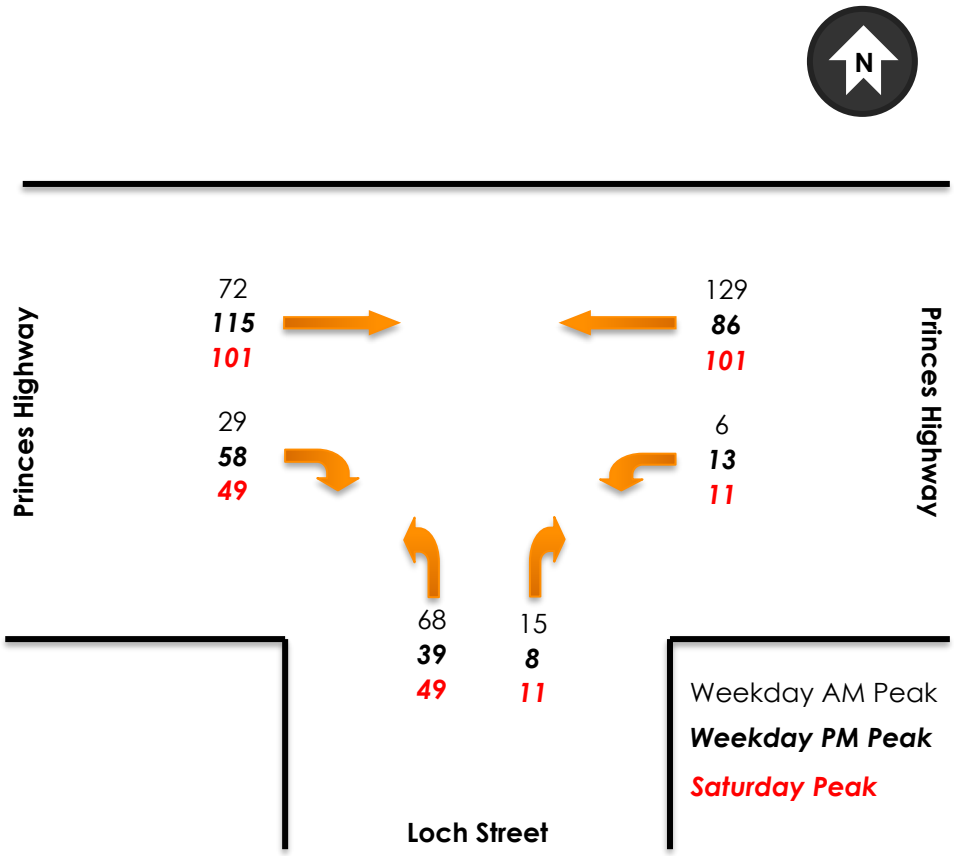
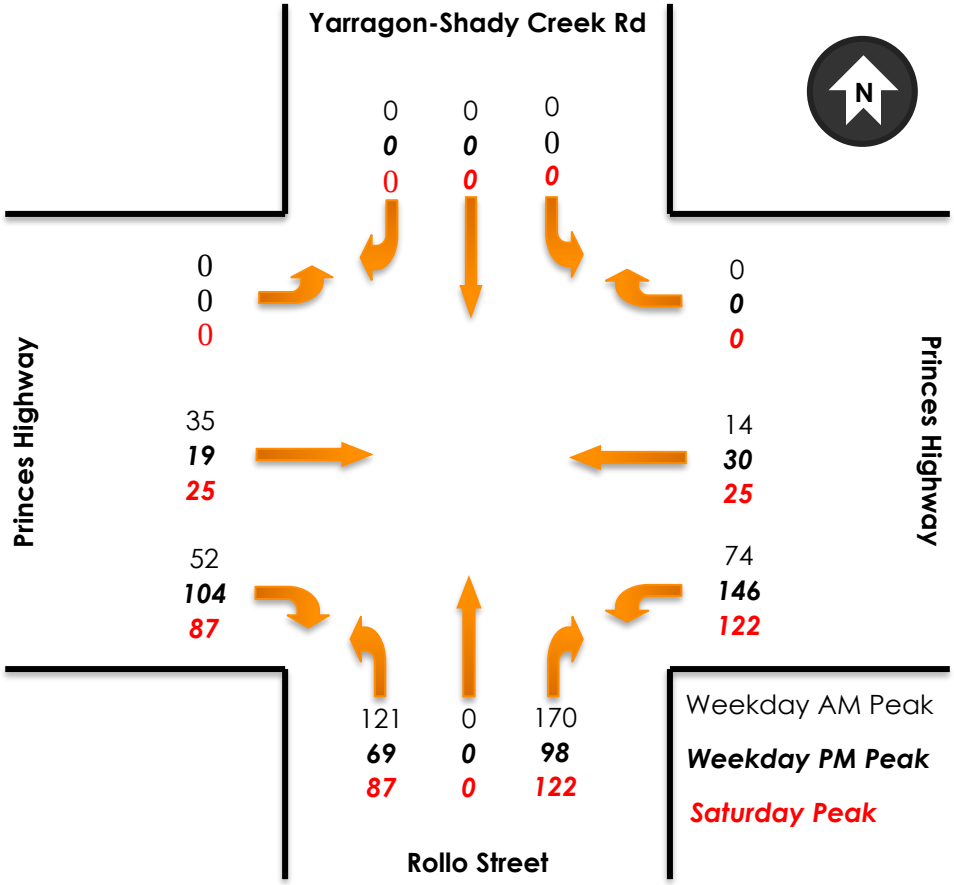


Figure 24 Generated Traffic Volumes – Princes Highway / Rollo Street



6.4 Traffic Impact

To assess the operation of the intersections in the future when all residential developments are fully built out, the generated traffic volumes at each intersection has been overlayed on to the existing traffic volumes to project the future volumes at each intersection. These future volumes have been input into SIDRA Intersection, a traffic modelling software package.

The results of the analysis are provided in Table 13 to Table 15 below.

Table 13 Princes Highway / Hazeldean Road – Future Conditions

Approach	Movement	DoS		Rating		Avg. Delay (sec)		Queue (m)	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future
Wednesday AM Peak (8am – 9am)									
Hazeldean Road (s)	Left	0.05	0.23	Excellent	Excellent	11	12	1	3
	Right	0.20	0.55	Excellent	Excellent	52	95	2	6
Princes Highway (e)	Left	0.03	0.03	Excellent	Excellent	6	6	0	0
	Through	0.28	0.30	Excellent	Excellent	0	0	0	0
Princes Highway (w)	Through	0.33	0.35	Excellent	Excellent	0	0	0	0
	Right	0.07	0.30	Excellent	Excellent	18	24	1	3
Wednesday PM Peak (4:15pm – 5:15pm)									
Hazeldean Road (s)	Left	0.03	0.16	Excellent	Excellent	13	14	1	4
	Right	0.34	**1.13**	Excellent	**Very Poor**	119	**499**	8	**44**
Princes Highway (e)	Left	0.02	0.03	Excellent	Excellent	6	6	0	0
	Through	0.36	0.39	Excellent	Excellent	0	0	0	0
Princes Highway (w)	Through	0.30	0.35	Excellent	Excellent	0	0	0	0
	Right	0.21	**1.14**	Excellent	**Very Poor**	31	**220**	5	**122**
Saturday Peak (12:15pm – 1:15pm)									
Hazeldean Road (s)	Left	0.04	0.17	Excellent	Excellent	11	12	1	5
	Right	0.08	0.35	Excellent	Excellent	43	81	2	9
Princes Highway (e)	Left	0.01	0.19	Excellent	Excellent	6	6	0	0
	Through	0.27	0.30	Excellent	Excellent	0	0	0	0
Princes Highway (w)	Through	0.27	0.31	Excellent	Excellent	0	0	0	0
	Right	0.09	0.47	Excellent	Excellent	16	27	2	15

Table 14 Princes Highway / Loch Street – Future Conditions

Approach	Movement	DoS		Rating		Avg. Delay (sec)		Queue (m)	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future
Wednesday AM Peak (8am – 9am)									
Loch Street (s)	Left	0.13	0.24	Excellent	Excellent	11	12	2	3
	Right	0.09	0.32	Excellent	Excellent	44	71	1	3
Princes Highway (e)	Left	0.01	0.01	Excellent	Excellent	6	6	0	0
	Through	0.25	0.29	Excellent	Excellent	0	0	0	0
Princes Highway (w)	Through	0.31	0.33	Excellent	Excellent	0	0	0	0
	Right	0.28	0.46	Excellent	Excellent	17	24	3	6
Wednesday PM Peak (4:15pm – 5:15pm)									
Loch Street (s)	Left	0.10	0.18	Excellent	Excellent	13	14	3	5
	Right	0.29	0.77	Excellent	Good	119	**297**	7	19
Princes Highway (e)	Left	0.01	0.02	Excellent	Excellent	6	6	0	0
	Through	0.36	0.38	Excellent	Excellent	0	0	0	0
Princes Highway (w)	Through	0.28	0.31	Excellent	Excellent	0	0	0	0
	Right	0.61	**1.18**	Very Good	**Very Poor**	43	**242**	17	**146**
Saturday Peak (12:15pm – 1:15pm)									
Loch Street (s)	Left	0.14	0.21	Excellent	Excellent	11	11	4	6
	Right	0.09	0.26	Excellent	Excellent	42	63	2	6
Princes Highway (e)	Left	0.01	0.02	Excellent	Excellent	6	6	0	0
	Through	0.25	0.28	Excellent	Excellent	0	0	0	0
Princes Highway (w)	Through	0.24	0.27	Excellent	Excellent	0	0	0	0
	Right	0.28	0.51	Excellent	Excellent	17	24	8	17

Table 15 Princes Highway / Rollo Street / Yarragon-Shady Creek Road – Future Conditions

Approach	Movement	DoS		Rating		Avg. Delay (sec)		Queue (m)	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future
Wednesday AM Peak (8am – 9am)									
Rollo Street (s)	Left	0.13	0.23	Excellent	Excellent	30	12	14	29
	Through	0.13	0.23	Excellent	Excellent	25	6	14	29
	Right	0.43	0.63	Excellent	Very Good	69	50	48	116
Princes Highway (e)	Left	0.38	0.57	Excellent	Excellent	15	26	98	163
	Through	0.38	0.57	Excellent	Excellent	10	24	109	178
	Right	0.13	0.09	Excellent	Excellent	84	75	5	5
Yarragon-Shady Creek Road (n)	Left	0.05	0.03	Excellent	Excellent	62	40	7	6
	Through	0.05	0.03	Excellent	Excellent	56	34	7	6
	Right	0.22	0.11	Excellent	Excellent	66	42	23	17
Princes Highway (w)	Left	0.02	0.03	Excellent	Excellent	14	24	4	6
	Through	0.43	0.64	Excellent	Very Good	11	27	131	211
	Right	0.16	0.63	Excellent	Very Good	85	80	6	34
Wednesday PM Peak (4:15pm – 5:15pm)									
Rollo Street (s)	Left	0.20	0.25	Excellent	Excellent	37	21	14	32
	Through	0.20	0.25	Excellent	Excellent	32	15	14	32
	Right	0.48	0.68	Excellent	Very Good	78	69	37	88
Princes Highway (e)	Left	0.48	0.68	Excellent	Very Good	14	25	138	252
	Through	0.48	0.68	Excellent	Very Good	8	21	143	265
	Right	0.16	0.06	Excellent	Excellent	85	72	6	6
Yarragon-Shady Creek Road (n)	Left	0.12	0.06	Excellent	Excellent	67	54	13	11
	Through	0.43	0.23	Excellent	Excellent	66	54	34	31
	Right	0.43	0.23	Excellent	Excellent	75	62	34	31
Princes Highway (w)	Left	0.04	0.05	Excellent	Excellent	11	19	7	10
	Through	0.36	0.45	Excellent	Excellent	8	18	71	144
	Right	0.24	0.70	Excellent	Good	85	79	10	67

Approach	Movement	DoS		Rating		Avg. Delay (sec)		Queue (m)	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future
Saturday Peak (12:15pm – 1:15pm)									
Rollo Street (s)	Left	0.14	0.21	Excellent	Excellent	26	13	15	27
	Through	0.14	0.21	Excellent	Excellent	21	8	15	27
	Right	0.38	0.59	Excellent	Excellent	70	59	39	97
Princes Highway (e)	Left	0.39	0.59	Excellent	Excellent	13	24	96	180
	Through	0.39	0.59	Excellent	Excellent	9	23	112	205
	Right	0.13	0.05	Excellent	Excellent	84	72	5	5
Yarragon-Shady Creek Road (n)	Left	0.06	0.03	Excellent	Excellent	63	49	7	6
	Through	0.21	0.12	Excellent	Excellent	59	44	21	18
	Right	0.21	0.12	Excellent	Excellent	67	52	21	18
Princes Highway (w)	Left	0.02	0.03	Excellent	Excellent	13	23	4	7
	Through	0.33	0.44	Excellent	Excellent	10	23	87	141
	Right	0.32	0.57	Excellent	Excellent	86	77	13	53

As shown above, the right turn movements into and out of Hazeldean Road and the right turn movement into Loch Street in the weekday afternoon peak hour exceed their theoretical capacity under the future conditions. With the right turn movements oversaturated, 95th percentile queue lengths longer than the right turn lanes on the western leg of the intersections (122 metres and 146 metres for the Hazeldean Road and Loch Street intersections respectively) are expected to occur. In addition, motorists are expected to experience significant delayed turning right out of the side streets on Princes Highway, with average delays of over 8 minutes at Hazeldean Road and nearly 5 minutes at Loch Street.

The Loch Street intersection with Princes Highway provides the most direct access to the centre of the Yarragon Township as well as currently serving more turning movements into the southern portion of Yarragon than the Hazeldean Road intersection. It is therefore recommended that the Princes Highway / Loch Street intersection be upgraded to a signalised intersection in the future to cater for the additional traffic generation from the new residential developments. The signalised intersection will improve the performance of the intersection during the peak and will provide more control to the right turn movements into and out of Loch Street. In addition, the intersection will be located approximately 200 metres east of Hazeldean Road and as such, will create more gaps in the through traffic along Princes Highway – enabling more right turn movements into and out of Hazeldean Road to occur and improving the operation of this intersection as well.

The signalised intersection at Princes Highway / Rollo Street / Yarragon-Shady Creek Road will continue to operate well within capacity during the peak hours, with reasonable queues and delayed experienced by motorists.

The above results are based on the full build out of dwellings to cater for the anticipated additional dwellings in the township area, which could take years to be completely realised. The timing for the above upgrade will be required to suit the level of development as it occurs. A mechanism to enable the upgrade of the intersection/s to a suitable ultimate arrangement should be investigated and resolved prior to any rezoning.

It should be acknowledged that each new development must go through the planning process and demonstrate its anticipated impact on the road network prior to a planning permit being issued. It is considered that through this process, the appropriate improvements to the intersection/s (if required) can be determined.

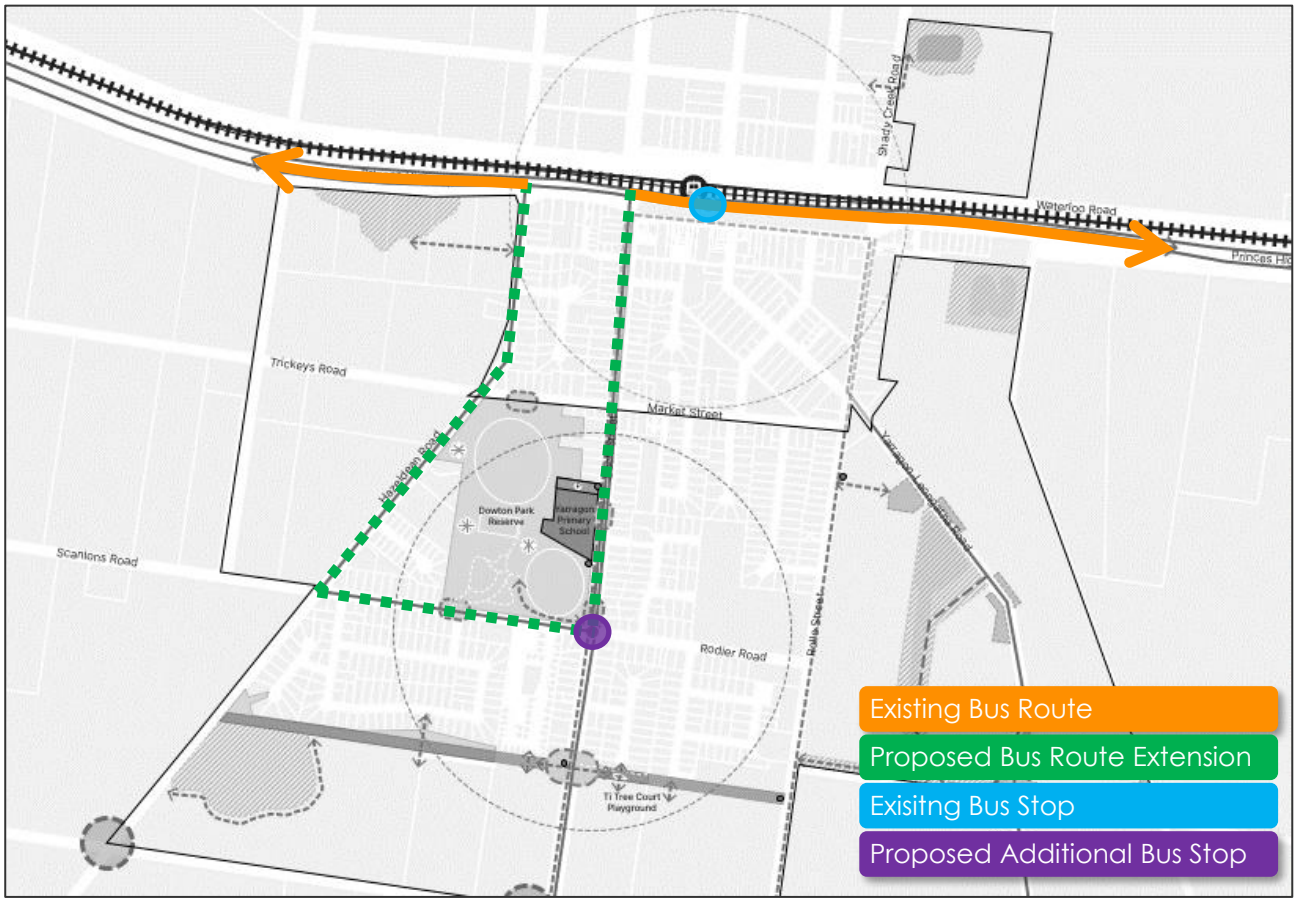
It should also be noted that it is currently not known the timeframe of the full build out of all new dwellings to the township and as such, no yearly growth rate factor has been applied to the through traffic volumes along Princes Highway when determining the future performance of the intersections. When either a full build out timeframe or a staged build out timeframe has been established, the intersections should be reassessed giving consideration to traffic volume growth along Princes Highway.

6.5 New Bus Stop

Consideration is being given to the construction of an additional bus stop away from Princes Highway to increase the catchment of the bus route and provide greater access to public transport for future residents. The bus stop is proposed to be located near the intersection of Loch Street and Rodier Road, with the new bus route detouring off Princes Highway into the southern section of Yarragon Township before returning back to Princes Highway utilising Loch Street, Rodier Street and Hazeldean Road.

A view of the potential bus stop location and bus route extension is provided in Figure 25 below.

Figure 25 Potential New Bus Stop & Bus Route



The proposal increases the bus route by 2.4 kilometres. With an average travel speed of 40km/h through the local streets, it is anticipated that the bus route extension would take an additional 3 and a half minutes plus time taken dropping-off/picking-up passengers at the new bus stop and to enter/exit Princes Highway.

All bus route changes and new bus stops are required to be consulted with and approved by Department of Transport and the bus operators to ensure travel times and scheduling commitments can be met. Of particular note, when buses are headed east, they will be required to turn right from Princes Highway into Hazeldean Road and then turn right again back onto Princes Highway from Loch Street. Understanding the delays associated with these movements at these intersections will be key to determining the bus route extension's viability.

Should travel times be deemed appropriate, the additional bus stop is considered to be a beneficial service provided to the community as it is located clear of the 400-metre radius catchment of the existing bus stop on Princes Highway and is well positioned to capture existing and future residents.

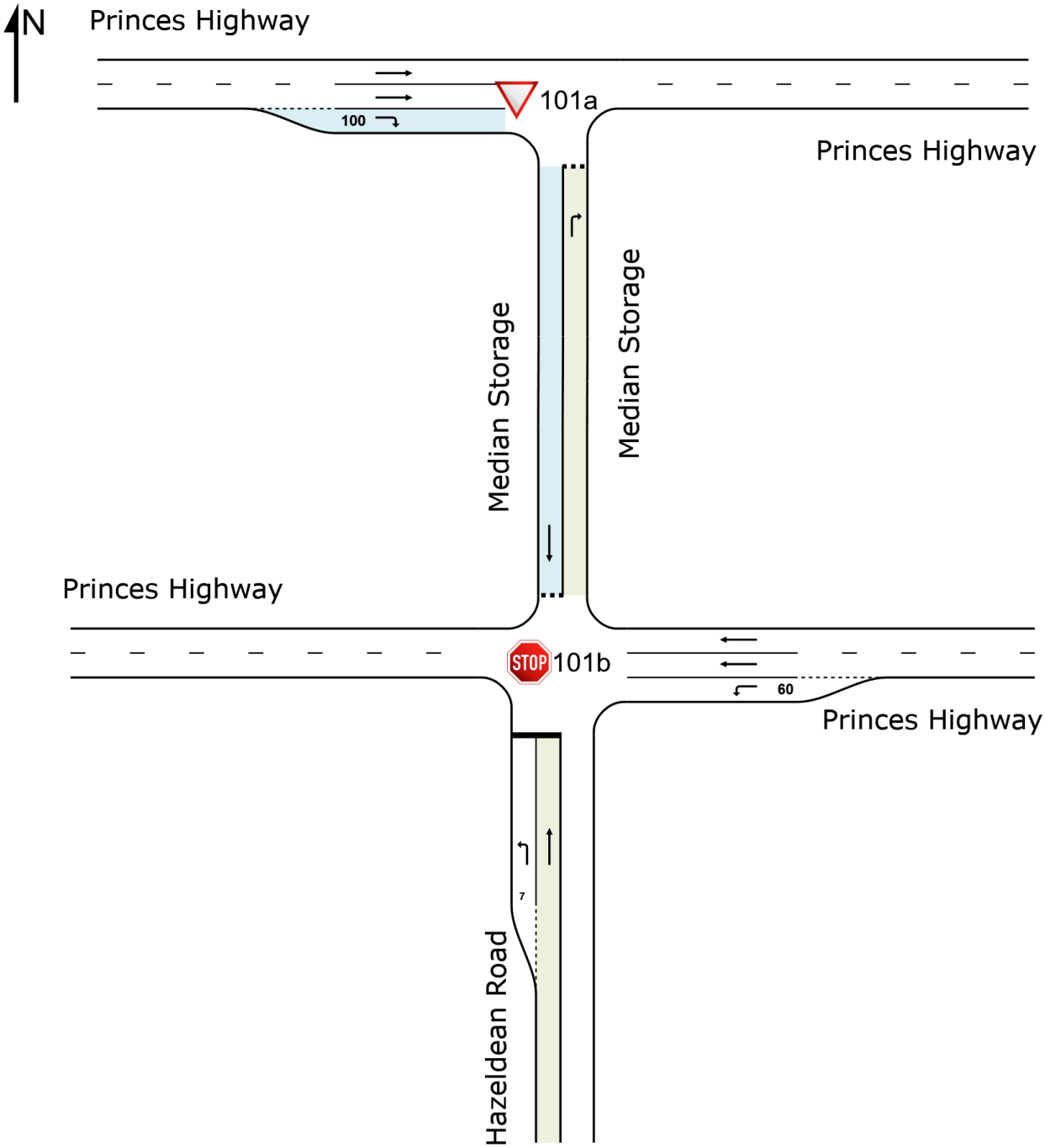
Appendix A SIDRA Analysis – Existing Conditions

NETWORK LAYOUT

Network: N101 [PrinHazeAMExE-Network (Network Folder: Wednesday AM Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101a	NA	PrinHazeAMExE-north
101b	NA	PrinHazeAMExE-south

MOVEMENT SUMMARY

Site: 101a [PrinHazeAMExE-north (Site Folder: Wednesday AM Peak Hour)]

Network: N101 [PrinHazeAMExE-Network (Network Folder: Wednesday AM Peak Hour)]

Princes Hwy / Hazeldean Rd - north section
AM Peak Hour, Existing Conditions

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	23	2.0	23	2.0	0.060	8.3	LOS A	0.1	0.5	0.74	0.80	0.74	42.2
Approach		23	2.0	23	2.0	0.060	8.3	LOS A	0.1	0.5	0.74	0.80	0.74	42.2
West: Princes Highway														
2	T1	1261	2.0	1261	2.0	0.328	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	21	2.0	21	2.0	0.011	5.7	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach		1282	2.0	1282	2.0	0.328	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
All Vehicles		1305	2.0	1305	2.0	0.328	0.3	NA	0.1	0.5	0.01	0.02	0.01	59.5

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

MOVEMENT SUMMARY

Site: 101b [PrinHazeAMExE-south (Site Folder: Wednesday AM Peak Hour)]

Network: N101 [PrinHazeAMExE-Network (Network Folder: Wednesday AM Peak Hour)]

Princes Hwy / Hazeldean Rd - south section
AM Peak Hour, Exisitng Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hazeldean Road														
1	L2	42	2.0	42	2.0	0.054	11.0	LOS B	0.1	0.6	0.52	0.92	0.52	50.4
2	T1	23	2.0	23	2.0	0.199	43.5	LOS E	0.3	2.0	0.91	1.01	0.95	25.6
Approach		65	2.0	65	2.0	0.199	22.5	LOS C	0.3	2.0	0.66	0.95	0.67	41.6
East: Princes Highway														
3	L2	54	2.0	54	2.0	0.029	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1066	2.0	1066	2.0	0.277	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1120	2.0	1120	2.0	0.277	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
North: Median Storage														
5	T1	21	2.0	21	2.0	0.070	11.8	LOS B	0.1	0.7	0.79	0.79	0.79	39.5
Approach		21	2.0	21	2.0	0.070	11.8	LOS B	0.1	0.7	0.79	0.79	0.79	39.5
All Vehicles		1206	2.0	1206	2.0	0.277	1.7	NA	0.3	2.0	0.05	0.09	0.05	58.1

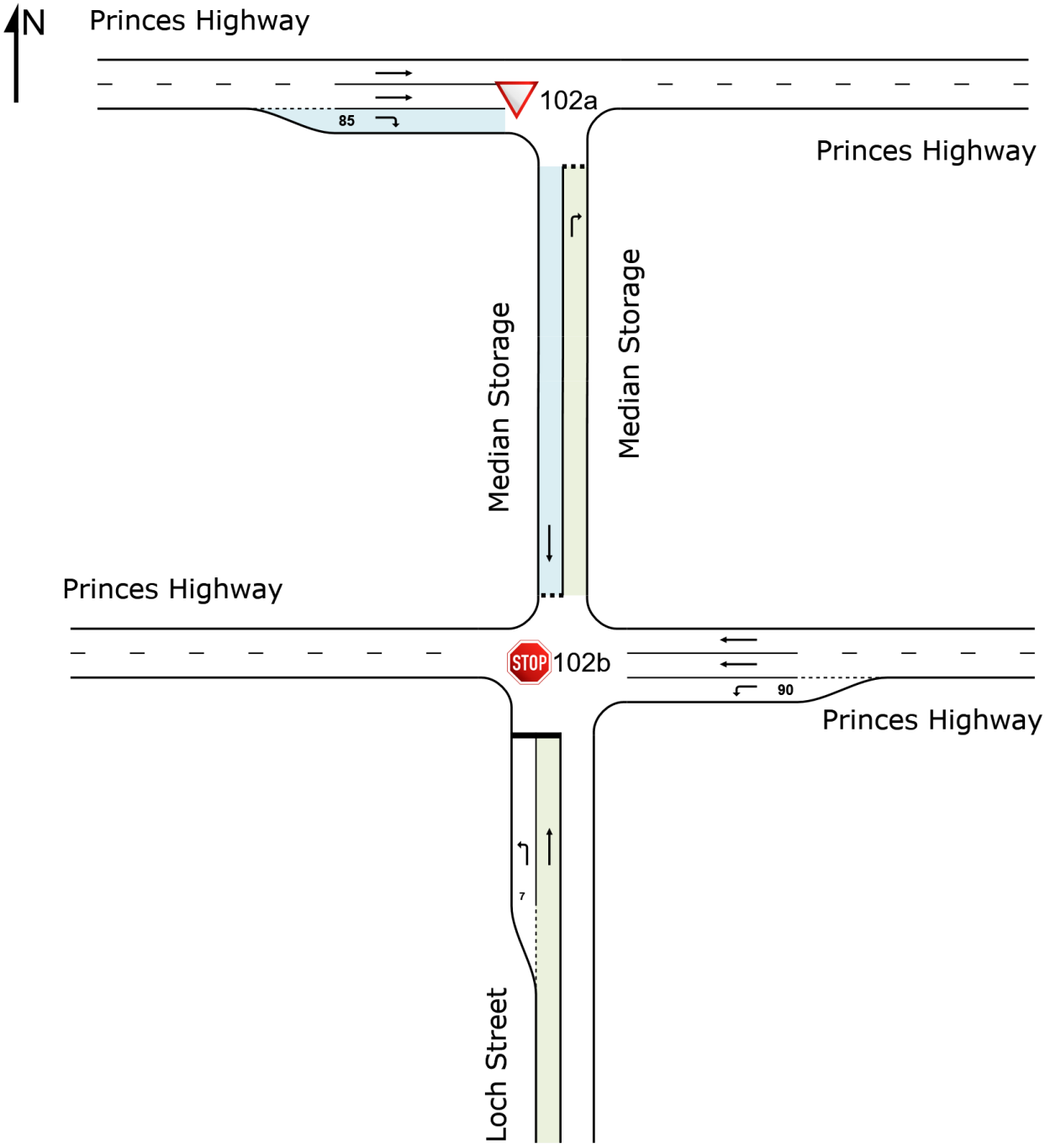
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

NETWORK LAYOUT

Network: N102 [PrinLochAMExE-Network (Network Folder: Wednesday AM Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
102a	NA	PrinLochAMExE-north
102b	NA	PrinLochAMExE-south

MOVEMENT SUMMARY

Site: 102a [PrinLochAMExE-north (Site Folder: Wednesday AM Peak Hour)]

Network: N102 [PrinLochAMExE-Network (Network Folder: Wednesday AM Peak Hour)]

Princes Hwy / Loch St - north section
AM Peak Hour, Existing Conditions

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	12	2.0	12	2.0	0.027	7.1	LOS A	0.0	0.2	0.70	0.77	0.70	43.4
Approach		12	2.0	12	2.0	0.027	7.1	LOS A	0.0	0.2	0.70	0.77	0.70	43.4
West: Princes Highway														
2	T1	1178	2.0	1178	2.0	0.306	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	103	2.0	103	2.0	0.063	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach		1281	2.0	1281	2.0	0.306	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.4
All Vehicles		1293	2.0	1293	2.0	0.306	0.6	NA	0.0	0.2	0.01	0.06	0.01	59.3

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

MOVEMENT SUMMARY

Site: 102b [PrinLochAMExE-south (Site Folder: Wednesday AM Peak Hour)]

Network: N102 [PrinLochAMExE-Network (Network Folder: Wednesday AM Peak Hour)]

Princes Hwy / Loch St - south section
AM Peak Hour, Exisitng Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Loch Street														
1	L2	111	2.0	111	2.0	0.133	10.8	LOS B	0.2	1.5	0.52	0.94	0.52	50.5
2	T1	12	2.0	12	2.0	0.088	37.2	LOS E	0.1	0.9	0.88	1.00	0.88	28.0
Approach		122	2.0	122	2.0	0.133	13.3	LOS B	0.2	1.5	0.55	0.95	0.55	48.5
East: Princes Highway														
3	L2	17	2.0	17	2.0	0.009	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	969	2.0	969	2.0	0.252	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		986	2.0	986	2.0	0.252	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
North: Median Storage														
5	T1	103	2.0	103	2.0	0.277	11.0	LOS B	0.5	3.3	0.79	0.87	0.91	40.1
Approach		103	2.0	103	2.0	0.277	11.0	LOS B	0.5	3.3	0.79	0.87	0.91	40.1
All Vehicles		1212	2.0	1212	2.0	0.277	2.4	NA	0.5	3.3	0.12	0.18	0.13	57.1

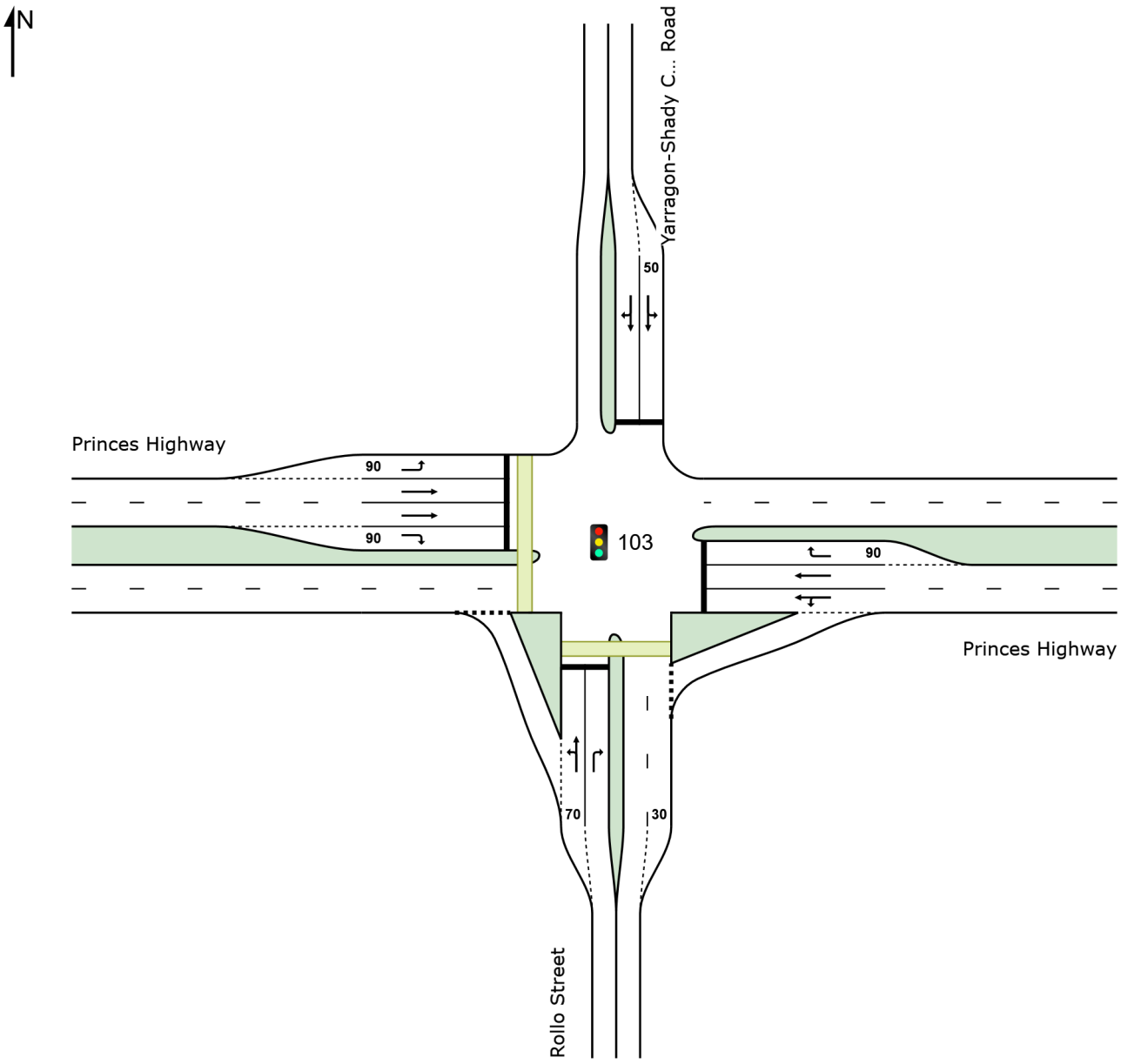
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

SITE LAYOUT

Site: 103 [PrinRollYarrAMExE (Site Folder: Wednesday AM Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
AM Peak Hour, Exisitng Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 103 [PrinRollYarrAMExE (Site Folder: Wednesday AM Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
AM Peak Hour, Exisitng Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Degree of Saturation)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Rollo Street														
1	L2	23	2.0	24	2.0	0.134	30.2	LOS A	2.0	14.1	0.75	0.65	0.75	41.1
2	T1	26	2.0	27	2.0	0.134	24.6	LOS A	2.0	14.1	0.75	0.65	0.75	41.6
3	R2	94	2.0	99	2.0	* 0.428	68.8	LOS A	6.7	47.7	0.95	0.79	0.95	27.9
Approach		143	2.0	151	2.0	0.428	54.6	LOS A	6.7	47.7	0.88	0.74	0.88	31.4
East: Princes Highway														
4	L2	92	2.0	97	2.0	0.381	14.5	LOS A	13.8	97.9	0.45	0.47	0.45	50.9
5	T1	858	2.0	903	2.0	0.381	10.0	LOS A	15.4	109.3	0.46	0.44	0.46	51.2
6	R2	9	2.0	9	2.0	0.129	84.4	LOS A	0.7	5.0	0.99	0.67	0.99	24.8
Approach		959	2.0	1009	2.0	0.381	11.1	LOS A	15.4	109.3	0.47	0.45	0.47	50.7
North: Yarragon-Shady Creek Road														
7	L2	4	2.0	4	2.0	0.054	61.8	LOS A	1.0	7.3	0.87	0.64	0.87	30.5
8	T1	12	2.0	13	2.0	0.054	56.2	LOS A	1.0	7.3	0.87	0.64	0.87	30.9
9	R2	48	2.0	51	2.0	0.221	66.4	LOS A	3.3	23.4	0.92	0.75	0.92	28.5
Approach		64	2.0	67	2.0	0.221	64.2	LOS A	3.3	23.4	0.90	0.72	0.90	29.0
West: Princes Highway														
10	L2	24	2.0	25	2.0	0.020	13.6	LOS A	0.6	4.1	0.34	0.64	0.34	47.9
11	T1	1078	2.0	1135	2.0	* 0.433	11.4	LOS A	18.3	130.6	0.49	0.44	0.49	50.5
12	R2	11	2.0	12	2.0	* 0.158	84.7	LOS A	0.9	6.2	0.99	0.68	0.99	24.8
Approach		1113	2.0	1172	2.0	0.433	12.2	LOS A	18.3	130.6	0.49	0.45	0.49	50.0
All Vehicles		2279	2.0	2399	2.0	0.433	15.9	LOS A	18.3	130.6	0.52	0.48	0.52	47.5

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Intersection and Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Rollo Street												
P1	Full	50	53	7.4	LOS A	0.1	0.1	0.31	0.31	38.4	37.2	0.97

West: Princes Highway											
P4 Full	50	53	52.2	LOS E	0.2	0.2	0.84	0.84	88.7	43.8	0.49
All Pedestrians	100	105	29.8	LOS C	0.2	0.2	0.57	0.57	63.5	40.5	0.64

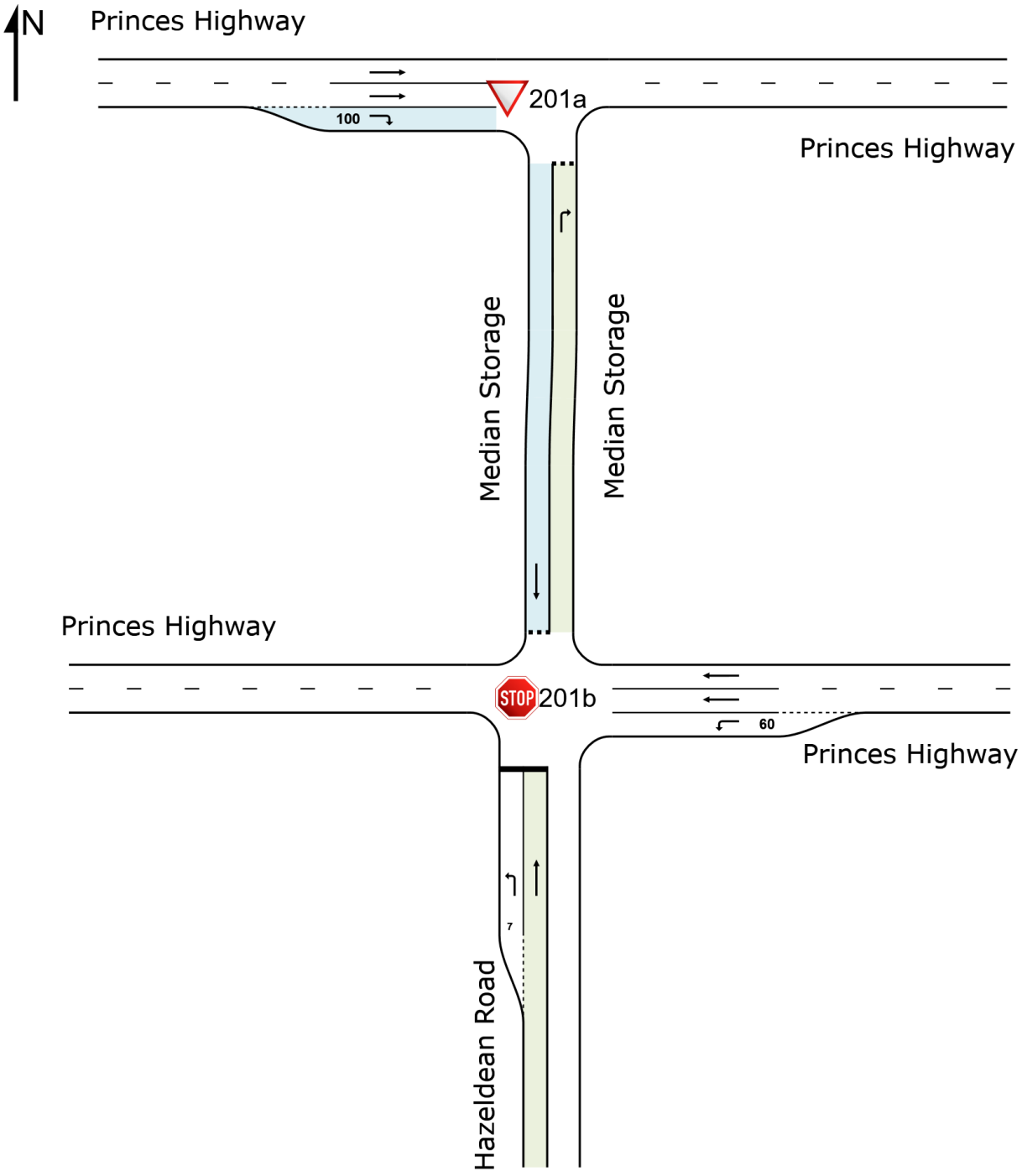
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N201 [PrinHazePMExE-Network (Network Folder: Wednesday PM Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
201a	NA	PrinHazePMExE-north
201b	NA	PrinHazePMExE-south

MOVEMENT SUMMARY

Site: 201a [PrinHazePMExE-north (Site Folder: Wednesday PM Peak Hour)]

Network: N201 [PrinHazePMExE-Network (Network Folder: Wednesday PM Peak Hour)]

Princes Hwy / Hazeldean Rd - north section
PM Peak Hour, Existing Conditions

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	16	2.0	16	2.0	0.036	7.0	LOS A	0.1	0.8	0.70	0.76	0.70	43.5
Approach		16	2.0	16	2.0	0.036	7.0	LOS A	0.1	0.8	0.70	0.76	0.70	43.5
West: Princes Highway														
2	T1	1160	2.0	1160	2.0	0.301	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	35	2.0	35	2.0	0.019	5.7	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach		1195	2.0	1195	2.0	0.301	0.3	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		1211	2.0	1211	2.0	0.301	0.3	LOS A	0.1	0.8	0.01	0.03	0.01	59.5

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: ONE MILE GRID | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 1:43:51 PM
Project: N:\Projects\2021\210823\Sidra\210823SID001A.sip9

MOVEMENT SUMMARY

Site: 201b [PrinHazePMExE-south (Site Folder: Wednesday PM Peak Hour)]

Network: N201 [PrinHazePMExE-Network (Network Folder: Wednesday PM Peak Hour)]

Princes Hwy / Hazeldean Rd - south section
PM Peak Hour, Exisitng Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hazeldean Road														
1	L2	18	2.0	18	2.0	0.030	12.5	LOS A	0.1	0.8	0.59	0.93	0.59	49.4
2	T1	16	2.0	16	2.0	0.344	112.0	LOS A	1.1	7.8	0.97	1.03	1.08	13.1
Approach		34	2.0	34	2.0	0.344	59.1	LOS A	1.1	7.8	0.77	0.97	0.82	26.7
East: Princes Highway														
3	L2	38	2.0	38	2.0	0.021	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1398	2.0	1398	2.0	0.363	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1436	2.0	1436	2.0	0.363	0.3	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
North: Median Storage														
5	T1	35	2.0	35	2.0	0.212	24.7	LOS A	0.7	5.1	0.90	0.94	0.96	31.1
Approach		35	2.0	35	2.0	0.212	24.7	LOS A	0.7	5.1	0.90	0.94	0.96	31.1
All Vehicles		1504	2.0	1504	2.0	0.363	2.1	LOS A	1.1	7.8	0.04	0.06	0.04	57.7

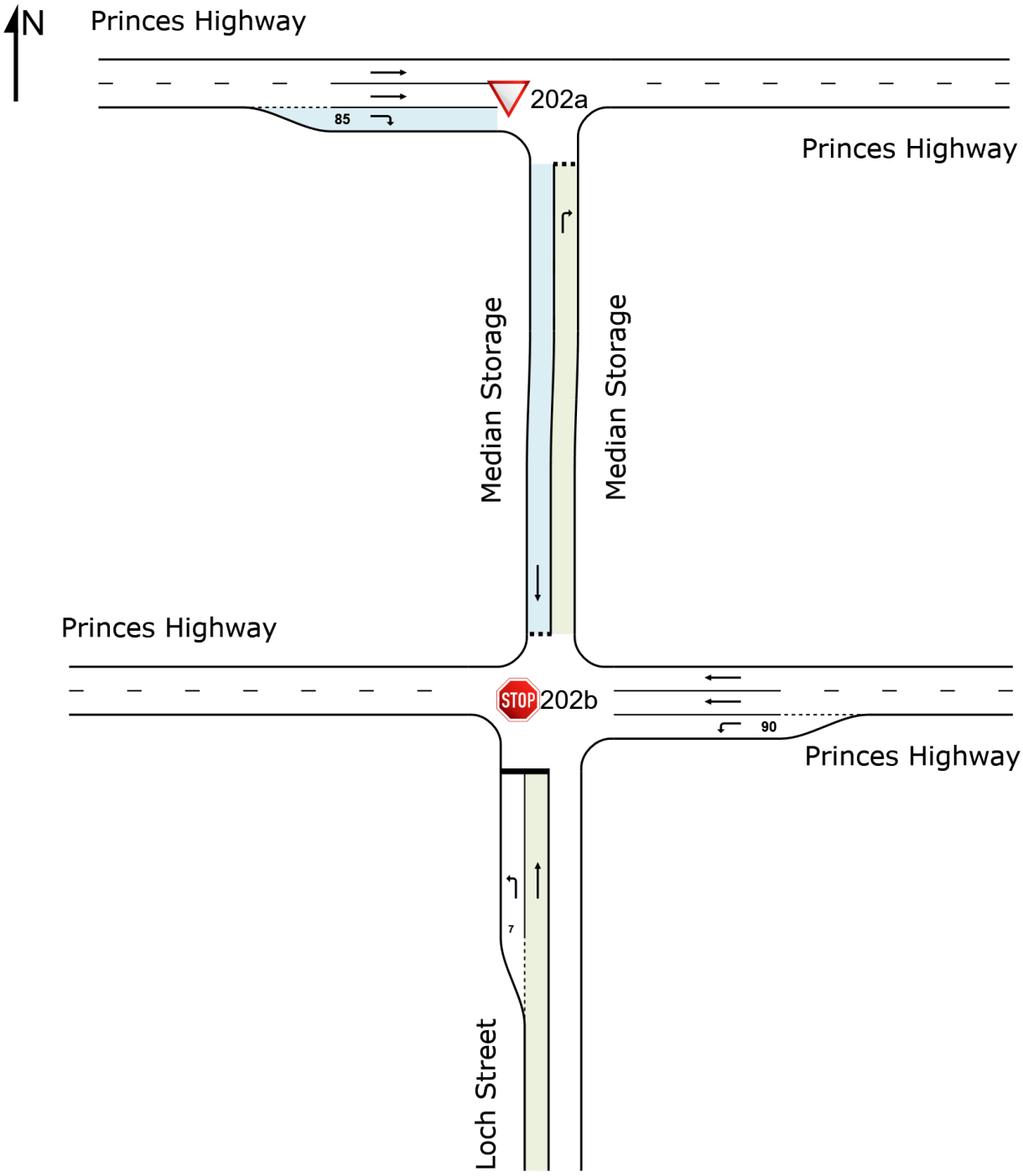
Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N202 [PrinLochPMExE-Network (Network Folder: Wednesday PM Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
202a	NA	PrinLochPMExE-north
202b	NA	PrinLochPMExE-south

MOVEMENT SUMMARY

Site: 202a [PrinLochPMExE-north (Site Folder: Wednesday PM Peak Hour)]

Network: N202 [PrinLochPMExE-Network (Network Folder: Wednesday PM Peak Hour)]

Princes Hwy / Loch St - north section
PM Peak Hour, Existing Conditions

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	13	2.0	13	2.0	0.025	5.9	LOS A	0.1	0.5	0.65	0.70	0.65	44.6
Approach		13	2.0	13	2.0	0.025	5.9	LOS A	0.1	0.5	0.65	0.70	0.65	44.6
West: Princes Highway														
2	T1	1065	2.0	1065	2.0	0.277	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	108	2.0	108	2.0	0.059	5.8	LOS A	0.3	2.1	0.00	0.63	0.00	50.5
Approach		1174	2.0	1174	2.0	0.277	0.6	LOS A	0.3	2.1	0.00	0.06	0.00	59.3
All Vehicles		1186	2.0	1186	2.0	0.277	0.7	LOS A	0.3	2.1	0.01	0.07	0.01	59.2

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: ONE MILE GRID | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 1:43:54 PM
Project: N:\Projects\2021\210823\Sidra\210823SID001A.sip9

MOVEMENT SUMMARY

Site: 202b [PrinLochPMExE-south (Site Folder: Wednesday PM Peak Hour)]

Network: N202 [PrinLochPMExE-Network (Network Folder: Wednesday PM Peak Hour)]

Princes Hwy / Loch St - south section
PM Peak Hour, Exisitng Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Loch Street														
1	L2	63	2.0	63	2.0	0.103	12.7	LOS A	0.4	2.7	0.60	0.99	0.60	49.4
2	T1	13	2.0	13	2.0	0.294	112.8	LOS A	0.9	6.5	0.97	1.02	1.05	13.1
Approach		76	2.0	76	2.0	0.294	29.3	LOS A	0.9	6.5	0.66	1.00	0.67	39.3
East: Princes Highway														
3	L2	18	2.0	18	2.0	0.010	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1375	2.0	1375	2.0	0.357	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1393	2.0	1393	2.0	0.357	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
North: Median Storage														
5	T1	108	2.0	108	2.0	0.613	36.6	LOS B	2.4	17.4	0.95	1.27	1.47	25.9
Approach		108	2.0	108	2.0	0.613	36.6	LOS B	2.4	17.4	0.95	1.27	1.47	25.9
All Vehicles		1577	2.0	1577	2.0	0.613	4.1	LOS B	2.4	17.4	0.10	0.14	0.13	55.7

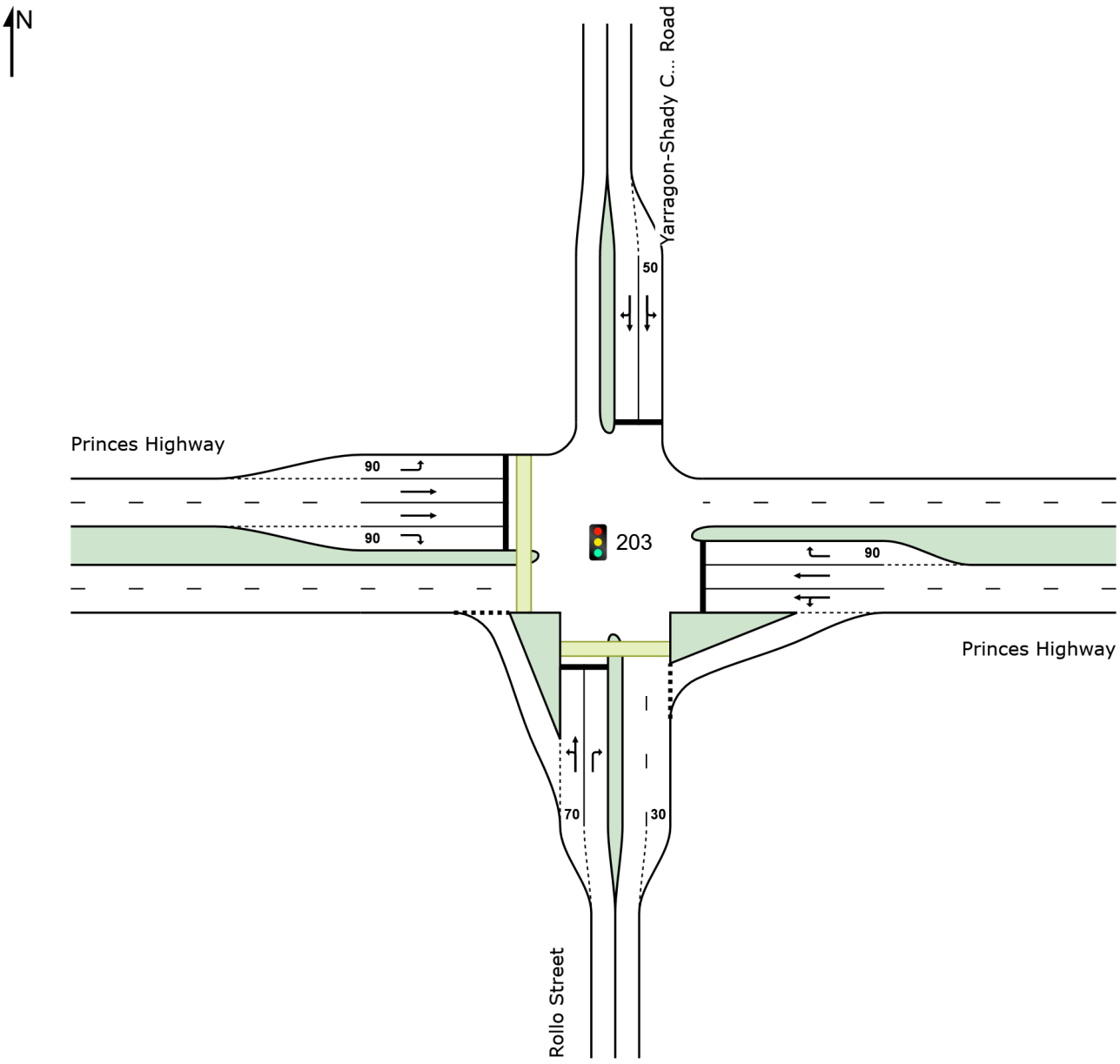
Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 203 [PrinRollYarrPMExE (Site Folder: Wednesday PM Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
PM Peak Hour, Exisitng Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 203 [PrinRollYarrPMExE (Site Folder: Wednesday PM Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
PM Peak Hour, Exisitng Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Degree of Saturation)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Rollo Street														
1	L2	13	2.0	14	2.0	0.204	37.4	LOS A	2.0	14.2	0.88	0.70	0.88	38.5
2	T1	32	2.0	34	2.0	0.204	31.8	LOS A	2.0	14.2	0.88	0.70	0.88	38.9
3	R2	68	2.0	72	2.0	* 0.484	77.8	LOS A	5.2	36.8	0.99	0.77	0.99	26.1
Approach		113	2.0	119	2.0	0.484	60.1	LOS A	5.2	36.8	0.95	0.74	0.95	30.0
East: Princes Highway														
4	L2	63	2.0	66	2.0	0.484	13.9	LOS A	19.3	137.5	0.44	0.44	0.44	51.8
5	T1	1236	2.0	1301	2.0	* 0.484	8.4	LOS A	20.1	143.2	0.45	0.43	0.45	52.5
6	R2	11	2.0	12	2.0	0.158	84.7	LOS A	0.9	6.2	0.99	0.68	0.99	24.8
Approach		1310	2.0	1379	2.0	0.484	9.3	LOS A	20.1	143.2	0.45	0.43	0.45	52.0
North: Yarragon-Shady Creek Road														
7	L2	19	2.0	20	2.0	0.116	66.6	LOS A	1.8	13.1	0.91	0.71	0.91	28.7
8	T1	21	2.0	22	2.0	0.425	66.4	LOS A	4.8	34.4	0.95	0.74	0.95	27.9
9	R2	52	2.0	55	2.0	0.425	75.4	LOS A	4.8	34.4	0.98	0.77	0.98	26.8
Approach		92	2.0	97	2.0	0.425	71.5	LOS A	4.8	34.4	0.96	0.75	0.96	27.4
West: Princes Highway														
10	L2	46	2.0	48	2.0	0.036	11.2	LOS A	0.9	6.7	0.29	0.64	0.29	49.4
11	T1	951	2.0	1001	2.0	0.355	7.5	LOS A	12.8	91.3	0.39	0.35	0.39	53.4
12	R2	17	2.0	18	2.0	* 0.244	85.4	LOS A	1.3	9.6	1.00	0.70	1.00	24.7
Approach		1014	2.0	1067	2.0	0.355	9.0	LOS A	12.8	91.3	0.39	0.37	0.39	52.2
All Vehicles		2529	2.0	2662	2.0	0.484	13.7	LOS A	20.1	143.2	0.47	0.43	0.47	48.9

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Intersection and Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Rollo Street												
P1	Full	50	53	5.1	LOS A	0.1	0.1	0.26	0.26	36.1	37.2	1.03

West: Princes Highway											
P4 Full	50	53	59.1	LOS E	0.2	0.2	0.89	0.89	95.6	43.8	0.46
All Pedestrians	100	105	32.1	LOS D	0.2	0.2	0.57	0.57	65.8	40.5	0.62

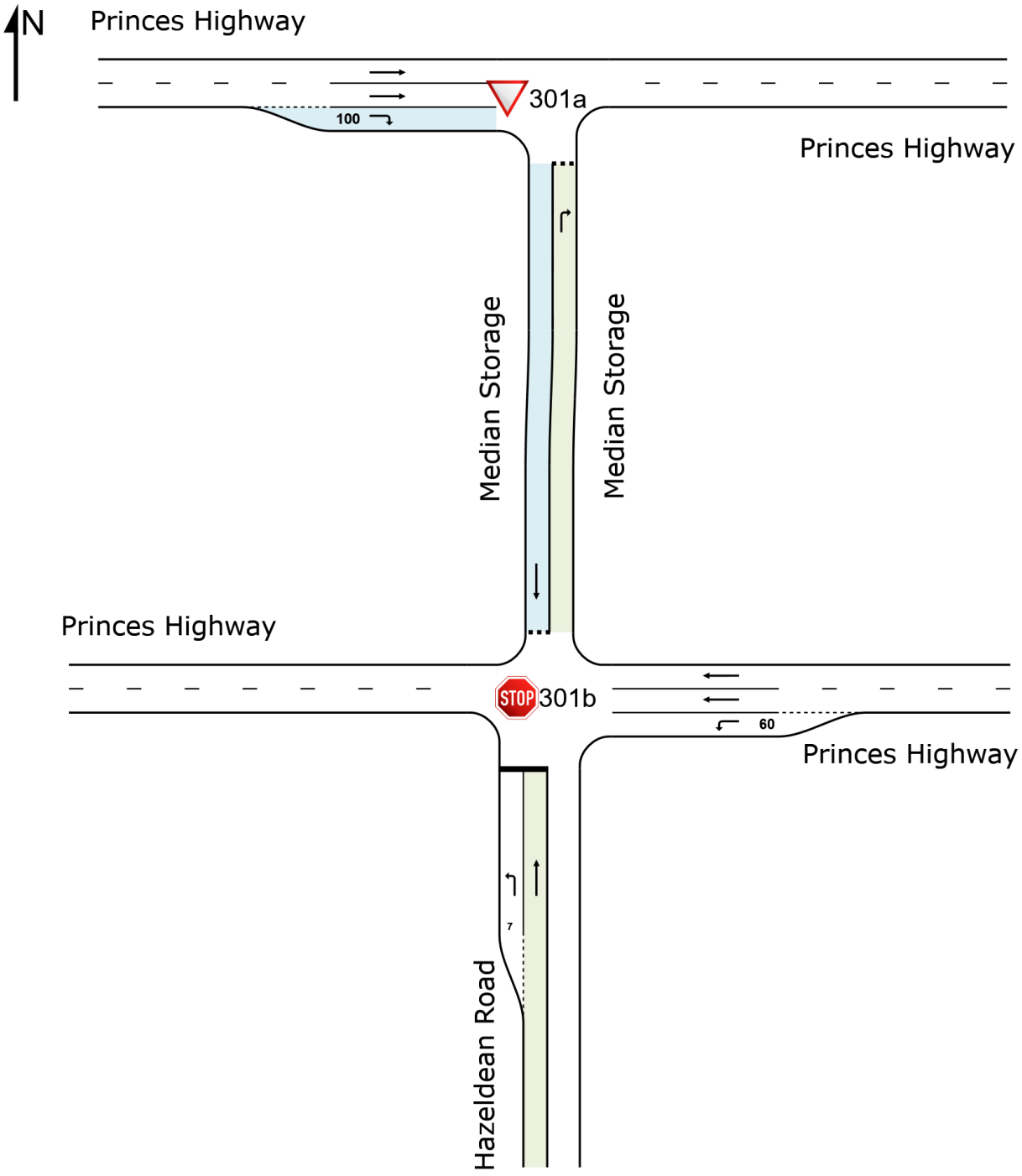
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N301 [PrinHazeSATExE-Network (Network Folder: Saturday Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
301a	NA	PrinHazeSATExE-north
301b	NA	PrinHazeSATExE-south

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 301a [PrinHazeSATExE-north (Site Folder: Saturday Peak Hour)]

Network: N301 [PrinHazeSATExE-Network (Network Folder: Saturday Peak Hour)]

Princes Hwy / Hazeldean Rd - north section
SAT Peak Hour, Existing Conditions

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	11	2.0	11	2.0	0.020	5.6	LOS A	0.1	0.4	0.63	0.67	0.63	45.0
Approach		11	2.0	11	2.0	0.020	5.6	LOS A	0.1	0.4	0.63	0.67	0.63	45.0
West: Princes Highway														
2	T1	1031	2.0	1031	2.0	0.268	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	29	2.0	29	2.0	0.016	5.7	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach		1060	2.0	1060	2.0	0.268	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		1071	2.0	1071	2.0	0.268	0.3	LOS A	0.1	0.4	0.01	0.02	0.01	59.6

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: ONE MILE GRID | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 1:43:57 PM
Project: N:\Projects\2021\210823\Sidra\210823SID001A.sip9

MOVEMENT SUMMARY

Site: 301b [PrinHazeSATExE-south (Site Folder: Saturday Peak Hour)]

Network: N301 [PrinHazeSATExE-Network (Network Folder: Saturday Peak Hour)]

Princes Hwy / Hazeldean Rd - south section
SAT Peak Hour, Exisitng Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hazeldean Road														
1	L2	31	2.0	31	2.0	0.038	10.8	LOS A	0.1	1.0	0.51	0.90	0.51	50.5
2	T1	11	2.0	11	2.0	0.080	37.0	LOS A	0.3	2.0	0.88	1.00	0.88	28.0
Approach		41	2.0	41	2.0	0.080	17.5	LOS A	0.3	2.0	0.60	0.92	0.60	45.1
East: Princes Highway														
3	L2	18	2.0	18	2.0	0.010	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1028	2.0	1028	2.0	0.267	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1046	2.0	1046	2.0	0.267	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
North: Median Storage														
5	T1	29	2.0	29	2.0	0.088	10.4	LOS A	0.3	2.2	0.77	0.77	0.77	40.7
Approach		29	2.0	29	2.0	0.088	10.4	LOS A	0.3	2.2	0.77	0.77	0.77	40.7
All Vehicles		1117	2.0	1117	2.0	0.267	1.1	LOS A	0.3	2.2	0.04	0.06	0.04	58.7

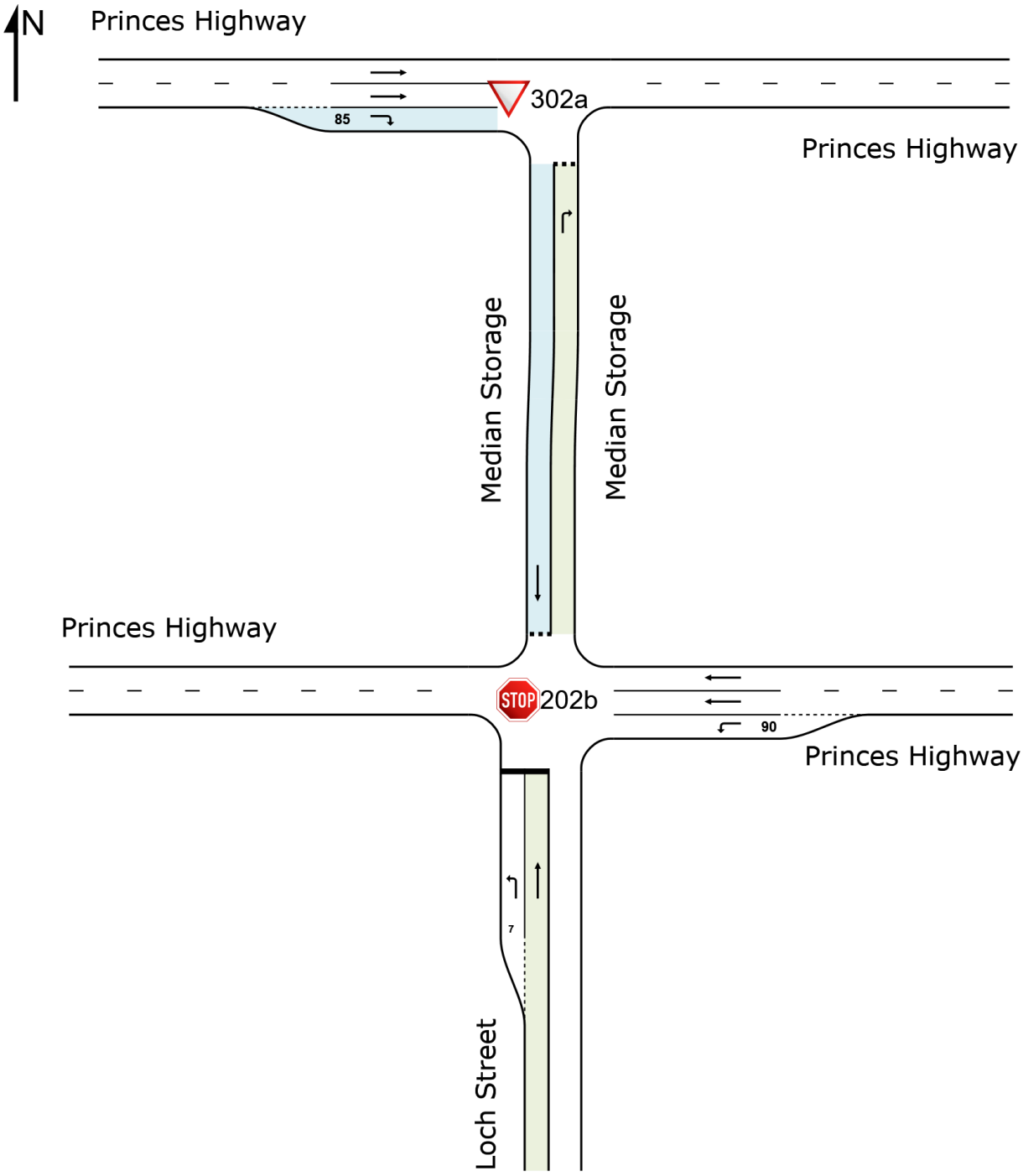
Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N302 [PrinLochSATExE-Network (Network Folder: Saturday Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
302a	NA	PrinLochSATExE-north
202b	NA	PrinLochSATExE-south

MOVEMENT SUMMARY

Site: 302a [PrinLochSATExE-north (Site Folder: Saturday Peak Hour)]

Network: N302 [PrinLochSATExE-Network (Network Folder: Saturday Peak Hour)]

Princes Hwy / Loch St - north section
SAT Peak Hour, Existing Conditions

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	12	2.0	12	2.0	0.019	4.7	LOS A	0.1	0.4	0.58	0.61	0.58	46.0
Approach		12	2.0	12	2.0	0.019	4.7	LOS A	0.1	0.4	0.58	0.61	0.58	46.0
West: Princes Highway														
2	T1	922	2.0	922	2.0	0.240	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	104	2.0	104	2.0	0.063	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach		1026	2.0	1026	2.0	0.240	0.6	LOS A	0.0	0.0	0.00	0.06	0.00	59.3
All Vehicles		1038	2.0	1038	2.0	0.240	0.7	LOS A	0.1	0.4	0.01	0.07	0.01	59.2

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: ONE MILE GRID | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 1:43:59 PM
Project: N:\Projects\2021\210823\Sidra\210823SID001A.sip9

MOVEMENT SUMMARY

Site: 202b [PrinLochSATExE-south (Site Folder: Saturday Peak Hour)]

Network: N302 [PrinLochSATExE-Network (Network Folder: Saturday Peak Hour)]

Princes Hwy / Loch St - south section
SAT Peak Hour, Exisitng Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Loch Street														
1	L2	113	2.0	113	2.0	0.135	10.8	LOS A	0.5	3.8	0.51	0.94	0.51	50.5
2	T1	12	2.0	12	2.0	0.087	36.7	LOS A	0.3	2.1	0.88	1.00	0.88	28.2
Approach		124	2.0	124	2.0	0.135	13.2	LOS A	0.5	3.8	0.55	0.94	0.55	48.6
East: Princes Highway														
3	L2	23	2.0	23	2.0	0.013	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	959	2.0	959	2.0	0.249	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		982	2.0	982	2.0	0.249	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
North: Median Storage														
5	T1	104	2.0	104	2.0	0.278	10.9	LOS A	1.2	8.3	0.79	0.87	0.91	40.2
Approach		104	2.0	104	2.0	0.278	10.9	LOS A	1.2	8.3	0.79	0.87	0.91	40.2
All Vehicles		1211	2.0	1211	2.0	0.278	2.5	LOS A	1.2	8.3	0.12	0.18	0.13	57.1

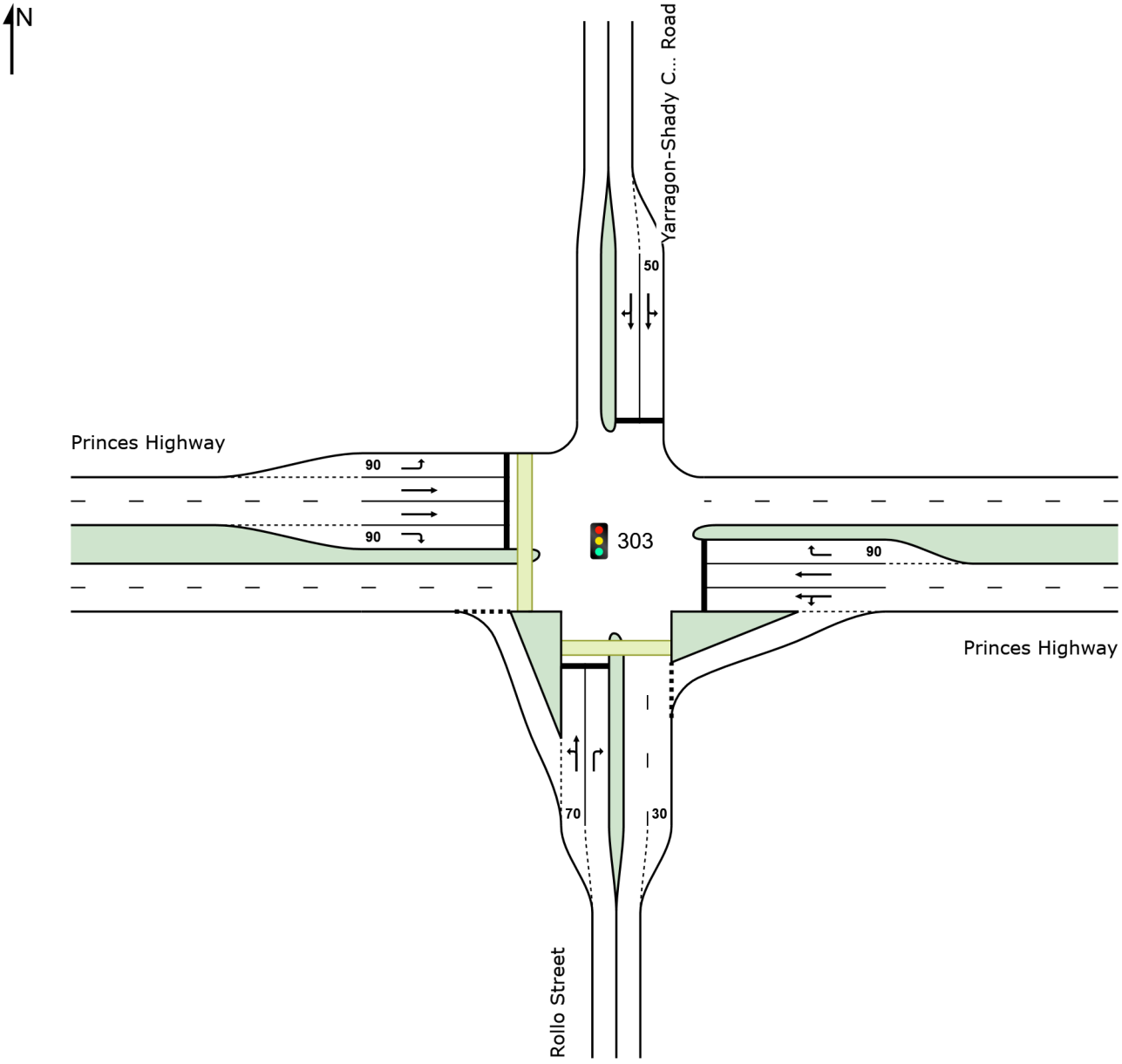
Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 303 [PrinRollYarrSATExE (Site Folder: Saturday Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
SAT Peak Hour, Exisitng Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 303 [PrinRollYarrSATExE (Site Folder: Saturday Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
SAT Peak Hour, Exisitng Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Degree of Saturation)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Rollo Street														
1	L2	33	2.0	35	2.0	0.143	26.3	LOS A	2.1	14.7	0.70	0.65	0.70	42.7
2	T1	23	2.0	24	2.0	0.143	20.7	LOS A	2.1	14.7	0.70	0.65	0.70	43.1
3	R2	77	2.0	81	2.0	* 0.382	70.1	LOS A	5.5	39.2	0.95	0.78	0.95	27.6
Approach		133	2.0	140	2.0	0.382	50.7	LOS A	5.5	39.2	0.85	0.72	0.85	32.5
East: Princes Highway														
4	L2	124	2.0	131	2.0	0.392	13.4	LOS A	13.5	95.9	0.44	0.48	0.44	51.5
5	T1	873	2.0	919	2.0	* 0.392	9.1	LOS A	15.7	111.7	0.45	0.44	0.45	51.8
6	R2	9	2.0	9	2.0	0.129	84.4	LOS A	0.7	5.0	0.99	0.67	0.99	24.8
Approach		1006	2.0	1059	2.0	0.392	10.3	LOS A	15.7	111.7	0.45	0.45	0.45	51.2
North: Yarragon-Shady Creek Road														
7	L2	6	2.0	6	2.0	0.056	62.8	LOS A	1.0	7.2	0.88	0.65	0.88	30.0
8	T1	16	2.0	17	2.0	0.205	59.0	LOS A	3.0	21.3	0.89	0.69	0.89	29.8
9	R2	37	2.0	39	2.0	0.205	67.1	LOS A	3.0	21.3	0.92	0.74	0.92	28.5
Approach		59	2.0	62	2.0	0.205	64.5	LOS A	3.0	21.3	0.91	0.72	0.91	29.0
West: Princes Highway														
10	L2	27	2.0	28	2.0	0.022	13.0	LOS A	0.6	4.4	0.33	0.64	0.33	48.3
11	T1	827	2.0	871	2.0	0.326	9.5	LOS A	12.3	87.4	0.43	0.38	0.43	51.9
12	R2	22	2.0	23	2.0	* 0.316	85.9	LOS A	1.8	12.5	1.00	0.71	1.00	24.6
Approach		876	2.0	922	2.0	0.326	11.6	LOS A	12.3	87.4	0.44	0.40	0.44	50.4
All Vehicles		2074	2.0	2183	2.0	0.392	15.0	LOS A	15.7	111.7	0.48	0.45	0.48	48.1

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Intersection and Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Rollo Street												
P1	Full	50	53	6.8	LOS A	0.1	0.1	0.30	0.30	37.8	37.2	0.99

West: Princes Highway											
P4 Full	50	53	53.9	LOS E	0.2	0.2	0.85	0.85	90.4	43.8	0.48
All Pedestrians	100	105	30.3	LOS D	0.2	0.2	0.57	0.57	64.1	40.5	0.63

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

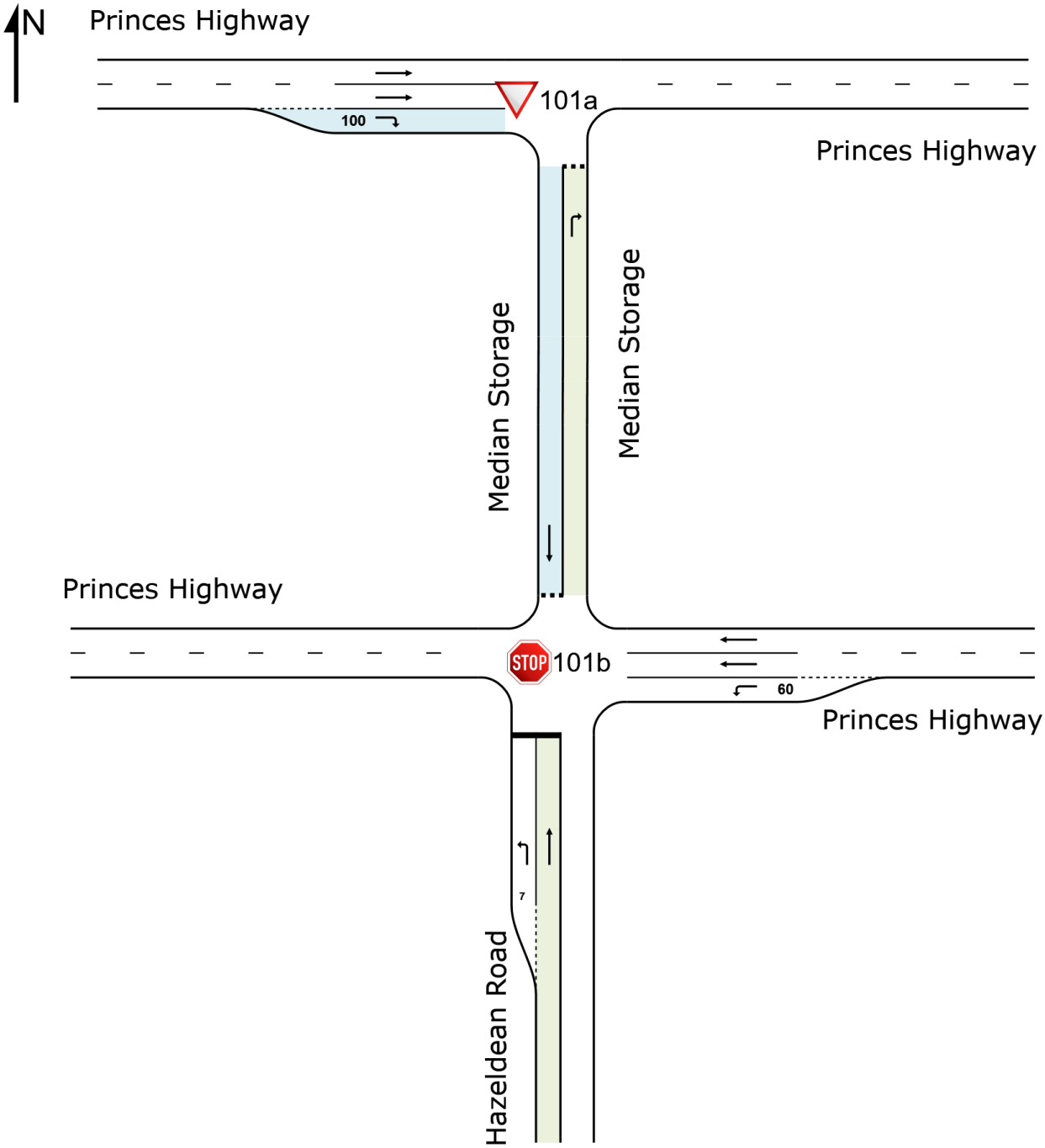
Appendix B SIDRA Analysis – Future Conditions

NETWORK LAYOUT

Network: N101 [PrinHazeAMFut-Network (Network Folder: Wednesday AM Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101a	NA	PrinHazeAMFut-north
101b	NA	PrinHazeAMFut-south

MOVEMENT SUMMARY

Site: 101a [PrinHazeAMFut-north (Site Folder: Wednesday AM Peak Hour)]

Network: N101 [PrinHazeAMFut-Network (Network Folder: Wednesday AM Peak Hour)]

Princes Hwy / Hazeldean Rd - north section
AM Peak Hour, Future Conditions

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	44	2.0	44	2.0	0.130	9.9	LOS A	0.2	1.1	0.79	0.83	0.79	40.7
Approach		44	2.0	44	2.0	0.130	9.9	LOS A	0.2	1.1	0.79	0.83	0.79	40.7
West: Princes Highway														
2	T1	1346	2.0	1346	2.0	0.350	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	75	2.0	75	2.0	0.045	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach		1421	2.0	1421	2.0	0.350	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles		1465	2.0	1465	2.0	0.350	0.7	NA	0.2	1.1	0.02	0.06	0.02	59.0

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

MOVEMENT SUMMARY

Site: 101b [PrinHazeAMFut-south (Site Folder: Wednesday AM Peak Hour)]

Network: N101 [PrinHazeAMFut-Network (Network Folder: Wednesday AM Peak Hour)]

Princes Hwy / Hazeldean Rd - south section
AM Peak Hour, Future Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hazeldean Road														
1	L2	167	2.0	167	2.0	0.231	11.9	LOS B	0.4	2.7	0.59	1.00	0.59	49.9
2	T1	44	2.0	44	2.0	0.549	84.7	LOS F	0.9	6.1	0.96	1.08	1.30	16.3
Approach		212	2.0	212	2.0	0.549	27.1	LOS D	0.9	6.1	0.67	1.02	0.74	40.1
East: Princes Highway														
3	L2	62	2.0	62	2.0	0.034	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1159	2.0	1159	2.0	0.301	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1221	2.0	1221	2.0	0.301	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.5
North: Median Storage														
5	T1	75	2.0	75	2.0	0.298	17.5	LOS C	0.5	3.3	0.86	0.96	1.01	35.3
Approach		75	2.0	75	2.0	0.298	17.5	LOS C	0.5	3.3	0.86	0.96	1.01	35.3
All Vehicles		1507	2.0	1507	2.0	0.549	5.0	NA	0.9	6.1	0.14	0.21	0.15	55.0

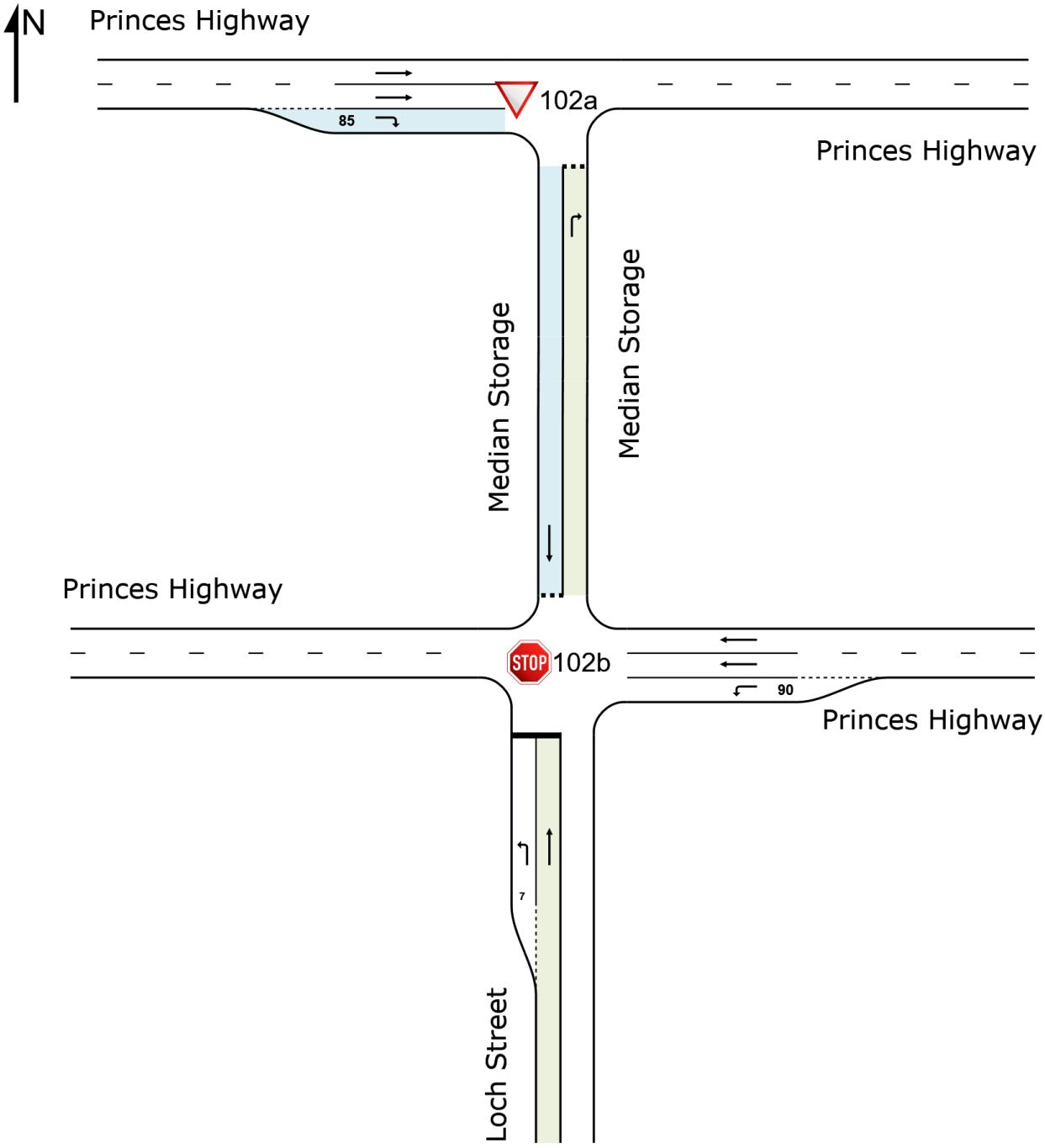
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

NETWORK LAYOUT

Network: N102 [PrinLochAMFut-Network (Network Folder: Wednesday AM Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
102a	NA	PrinLochAMFut-north
102b	NA	PrinLochAMFut-south

MOVEMENT SUMMARY

Site: 102a [PrinLochAMFut-north (Site Folder: Wednesday AM Peak Hour)]

Network: N102 [PrinLochAMFut-Network (Network Folder: Wednesday AM Peak Hour)]

Princes Hwy / Loch St - north section
AM Peak Hour, Future Conditions

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	27	2.0	27	2.0	0.070	8.3	LOS A	0.1	0.6	0.74	0.80	0.74	42.2
Approach		27	2.0	27	2.0	0.070	8.3	LOS A	0.1	0.6	0.74	0.80	0.74	42.2
West: Princes Highway														
2	T1	1254	2.0	1254	2.0	0.326	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	134	2.0	134	2.0	0.115	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach		1387	2.0	1387	2.0	0.326	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
All Vehicles		1415	2.0	1415	2.0	0.326	0.8	NA	0.1	0.6	0.01	0.08	0.01	59.0

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

MOVEMENT SUMMARY

Site: 102b [PrinLochAMFut-south (Site Folder: Wednesday AM Peak Hour)]

Network: N102 [PrinLochAMFut-Network (Network Folder: Wednesday AM Peak Hour)]

Princes Hwy / Loch St - south section
AM Peak Hour, Future Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Loch Street														
1	L2	182	2.0	182	2.0	0.242	11.7	LOS B	0.4	2.8	0.58	1.00	0.59	50.0
2	T1	27	2.0	27	2.0	0.318	62.9	LOS F	0.5	3.2	0.94	1.03	1.07	20.2
Approach		209	2.0	209	2.0	0.318	18.4	LOS C	0.5	3.2	0.63	1.00	0.65	45.3
East: Princes Highway														
3	L2	23	2.0	23	2.0	0.013	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1105	2.0	1105	2.0	0.287	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1128	2.0	1128	2.0	0.287	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
North: Median Storage														
5	T1	134	2.0	134	2.0	0.457	17.9	LOS C	0.8	6.0	0.87	1.10	1.22	35.0
Approach		134	2.0	134	2.0	0.457	17.9	LOS C	0.8	6.0	0.87	1.10	1.22	35.0
All Vehicles		1472	2.0	1472	2.0	0.457	4.4	NA	0.8	6.0	0.17	0.25	0.20	55.3

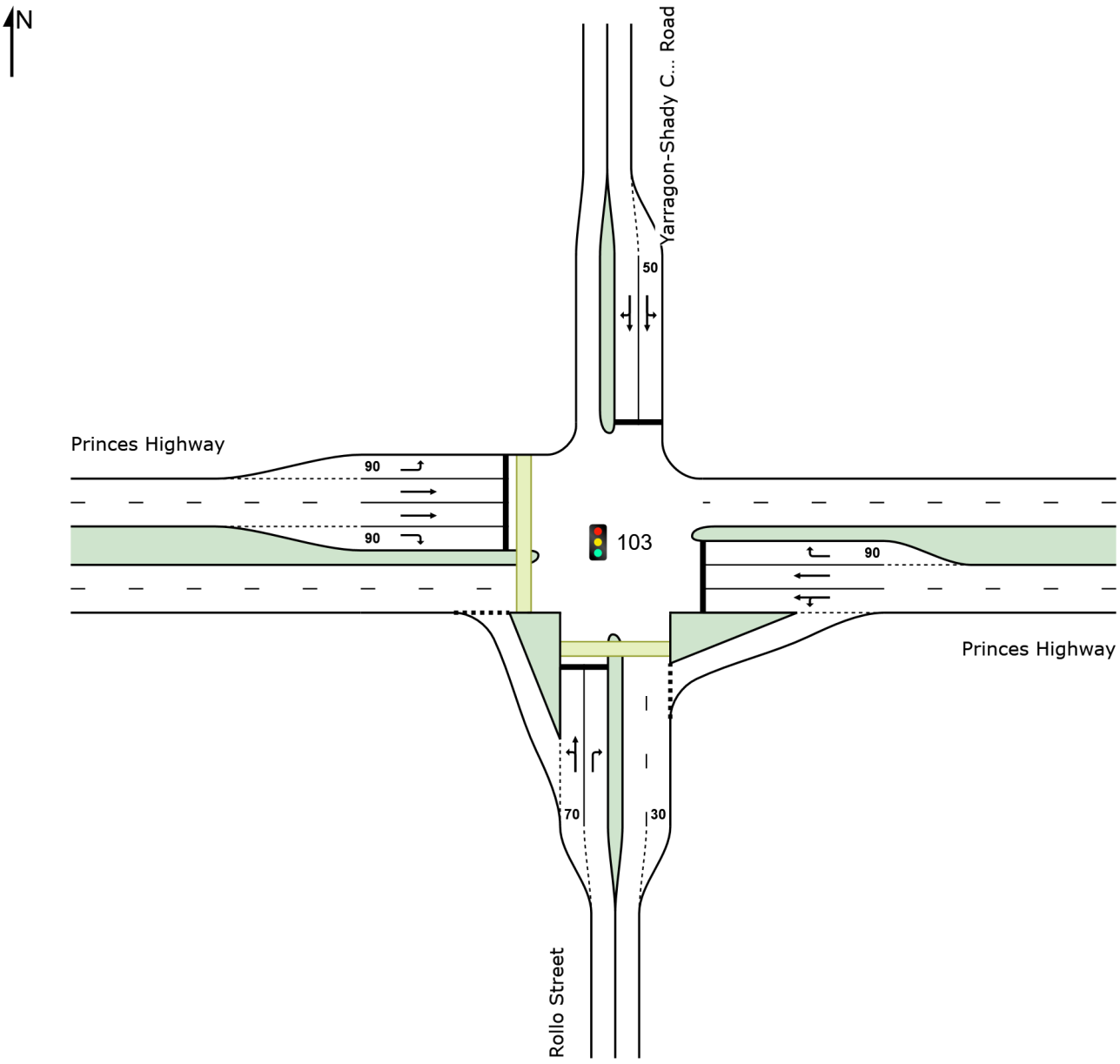
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

SITE LAYOUT

Site: 103 [PrinRollYarrAMFut (Site Folder: Wednesday AM Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
AM Peak Hour, Future Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 103 [PrinRollYarrAMFut (Site Folder: Wednesday AM Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
AM Peak Hour, Future Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Degree of Saturation)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Rollo Street														
1	L2	144	2.0	152	2.0	0.226	12.0	LOS A	4.0	28.6	0.43	0.64	0.43	50.2
2	T1	26	2.0	27	2.0	0.226	6.4	LOS A	4.0	28.6	0.43	0.64	0.43	50.8
3	R2	264	2.0	278	2.0	* 0.627	49.9	LOS B	16.3	116.0	0.91	0.84	0.91	32.6
Approach		434	2.0	457	2.0	0.627	34.7	LOS B	16.3	116.0	0.72	0.76	0.72	37.8
East: Princes Highway														
4	L2	166	2.0	175	2.0	0.565	26.2	LOS A	22.9	163.1	0.73	0.71	0.73	43.5
5	T1	872	2.0	918	2.0	0.565	23.5	LOS A	25.0	177.9	0.74	0.69	0.74	42.9
6	R2	9	2.0	9	2.0	0.091	75.4	LOS A	0.6	4.5	0.97	0.67	0.97	26.5
Approach		1047	2.0	1102	2.0	0.565	24.4	LOS A	25.0	177.9	0.74	0.69	0.74	42.8
North: Yarragon-Shady Creek Road														
7	L2	4	2.0	4	2.0	0.028	39.8	LOS A	0.8	5.5	0.71	0.56	0.71	37.3
8	T1	12	2.0	13	2.0	0.028	34.3	LOS A	0.8	5.5	0.71	0.56	0.71	38.0
9	R2	48	2.0	51	2.0	0.110	42.0	LOS A	2.4	17.3	0.74	0.72	0.74	35.1
Approach		64	2.0	67	2.0	0.110	40.4	LOS A	2.4	17.3	0.74	0.68	0.74	35.8
West: Princes Highway														
10	L2	24	2.0	25	2.0	0.028	24.1	LOS A	0.8	6.0	0.53	0.67	0.53	42.1
11	T1	1113	2.0	1172	2.0	* 0.635	26.6	LOS B	29.6	210.7	0.78	0.70	0.78	41.8
12	R2	63	2.0	66	2.0	* 0.634	79.9	LOS B	4.7	33.7	1.00	0.79	1.08	25.6
Approach		1200	2.0	1263	2.0	0.635	29.4	LOS B	29.6	210.7	0.78	0.70	0.79	40.4
All Vehicles		2745	2.0	2889	2.0	0.635	28.6	LOS B	29.6	210.7	0.76	0.71	0.76	40.7

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Intersection and Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Rollo Street												
P1	Full	50	53	17.0	LOS B	0.1	0.1	0.49	0.49	48.0	37.2	0.77

West: Princes Highway											
P4	Full	50	53	32.3	LOS D	0.1	0.1	0.68	0.68	68.8	43.8	0.64
All Pedestrians		100	105	24.7	LOS C	0.1	0.1	0.59	0.59	58.4	40.5	0.69

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

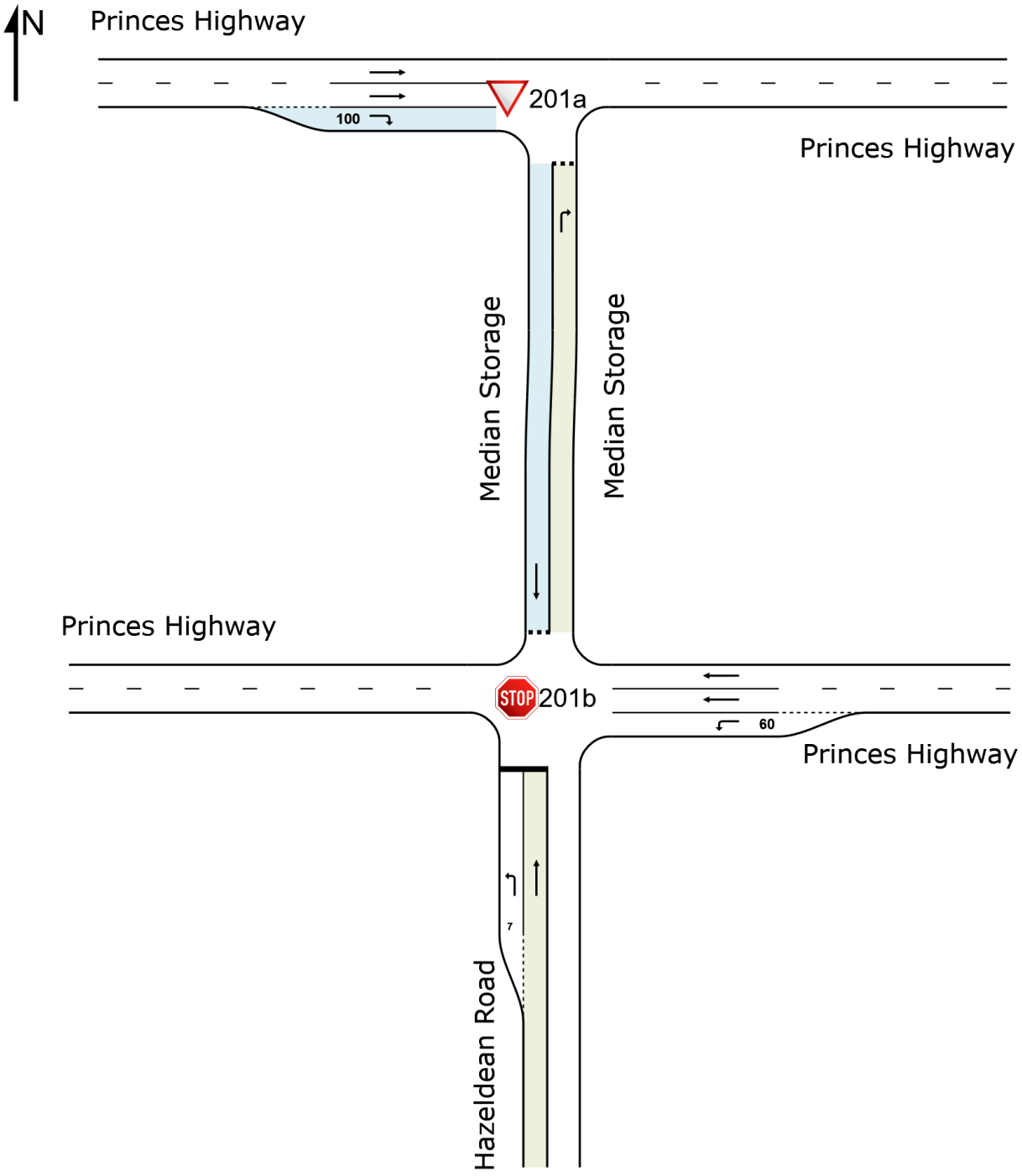
SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

NETWORK LAYOUT

Network: N201 [PrinHazePMFut-Network (Network Folder: Wednesday PM Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
201a	NA	PrinHazePMFut-north
201b	NA	PrinHazePMFut-south

MOVEMENT SUMMARY

Site: 201a [PrinHazePMFut-north (Site Folder: Wednesday PM Peak Hour)]

Network: N201 [PrinHazePMFut-Network (Network Folder: Wednesday PM Peak Hour)]

Princes Hwy / Hazeldean Rd - north section
PM Peak Hour, Future Conditions

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	27	2.0	24	2.0	0.070	9.4	LOS A	0.2	1.5	0.77	0.82	0.77	41.2
Approach		27	2.0	24[N1]	2.0	0.070	9.4	LOS A	0.2	1.5	0.77	0.82	0.77	41.2
West: Princes Highway														
2	T1	1331	2.0	1331	2.0	0.346	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	142	2.0	142	2.0	0.078	5.8	LOS A	14.7	105.0	0.00	0.63	0.00	50.5
Approach		1473	2.0	1473	2.0	0.346	0.7	LOS A	14.7	105.0	0.00	0.06	0.00	59.2
All Vehicles		1500	2.0	1497[N1]	2.0	0.346	0.8	LOS A	14.7	105.0	0.01	0.07	0.01	59.0

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 201b [PrinHazePMFut-south (Site Folder: Wednesday PM Peak Hour)]

Network: N201 [PrinHazePMFut-Network (Network Folder: Wednesday PM Peak Hour)]

Princes Hwy / Hazeldean Rd - south section
PM Peak Hour, Future Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hazeldean Road														
1	L2	89	2.0	89	2.0	0.164	13.7	LOS A	0.6	4.3	0.66	1.00	0.66	48.7
2	T1	27	2.0	27	2.0	1.125	490.3	LOS F	6.2	43.8	1.00	1.29	2.31	3.4
Approach		117	2.0	117	2.0	1.125	125.4	LOS F	6.2	43.8	0.74	1.07	1.05	17.7
East: Princes Highway														
3	L2	56	2.0	56	2.0	0.030	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1512	2.0	1512	2.0	0.393	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1567	2.0	1567	2.0	0.393	0.3	LOS A	0.0	0.0	0.00	0.02	0.00	59.5
North: Median Storage														
5	T1	142	2.0	142	2.0	1.135	213.9	LOS F	2.4	17.4	1.00	3.81	5.70	7.4
Approach		142	2.0	142	2.0	1.135	213.9	LOS F	2.4	17.4	1.00	3.81	5.70	7.4
All Vehicles		1826	2.0	1826	2.0	1.135	24.9	LOS F	6.2	43.8	0.13	0.38	0.51	41.4

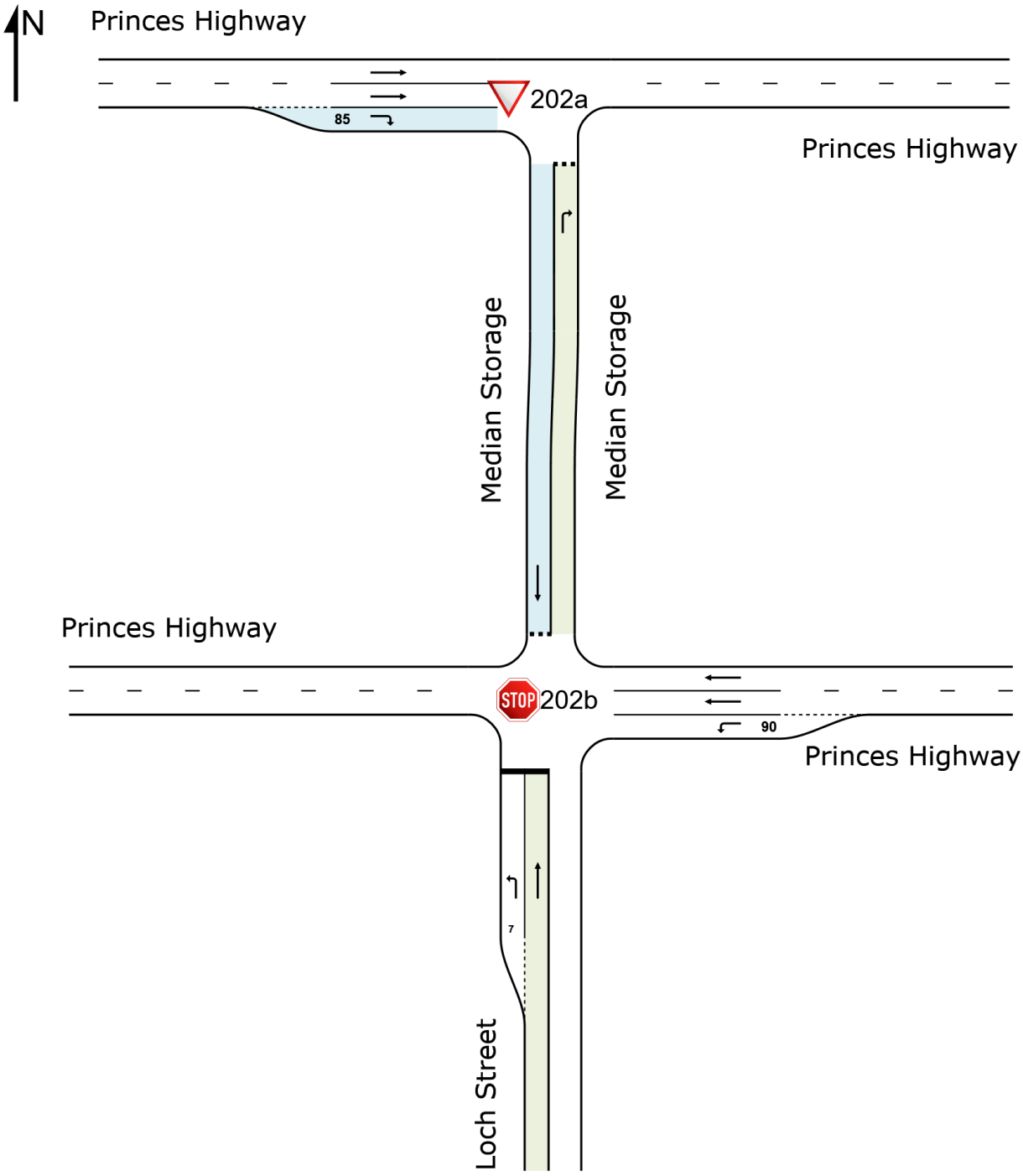
Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N202 [PrinLochPMFut-Network (Network Folder: Wednesday PM Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
202a	NA	PrinLochPMFut-north
202b	NA	PrinLochPMFut-south

MOVEMENT SUMMARY

Site: 202a [PrinLochPMFut-north (Site Folder: Wednesday PM Peak Hour)]

Network: N202 [PrinLochPMFut-Network (Network Folder: Wednesday PM Peak Hour)]

Princes Hwy / Loch St - north section
PM Peak Hour, Future Conditions

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	21	2.0	21	2.0	0.049	7.3	LOS A	0.1	1.0	0.71	0.77	0.71	43.2
Approach		21	2.0	21	2.0	0.049	7.3	LOS A	0.1	1.0	0.71	0.77	0.71	43.2
West: Princes Highway														
2	T1	1186	2.0	1186	2.0	0.308	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	169	2.0	169	2.0	0.093	5.8	LOS A	20.5	145.8	0.00	0.63	0.00	50.5
Approach		1356	2.0	1356	2.0	0.308	0.8	LOS A	20.5	145.8	0.00	0.08	0.00	59.1
All Vehicles		1377	2.0	1377	2.0	0.308	0.9	LOS A	20.5	145.8	0.01	0.09	0.01	58.9

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: ONE MILE GRID | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 1:37:07 PM
Project: N:\Projects\2021\210823\Sidra\210823SID002A-Future.sip9

MOVEMENT SUMMARY

Site: 202b [PrinLochPMFut-south (Site Folder: Wednesday PM Peak Hour)]

Network: N202 [PrinLochPMFut-Network (Network Folder: Wednesday PM Peak Hour)]

Princes Hwy / Loch St - south section
PM Peak Hour, Future Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Loch Street														
1	L2	104	2.0	104	2.0	0.184	13.5	LOS A	0.7	4.9	0.65	1.00	0.65	48.9
2	T1	21	2.0	21	2.0	0.766	290.0	LOS C	2.7	19.0	0.99	1.09	1.41	5.8
Approach		125	2.0	125	2.0	0.766	59.9	LOS C	2.7	19.0	0.71	1.02	0.78	29.0
East: Princes Highway														
3	L2	32	2.0	32	2.0	0.017	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1465	2.0	1465	2.0	0.381	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1497	2.0	1497	2.0	0.381	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
North: Median Storage														
5	T1	169	2.0	169	2.0	1.180	235.9	LOS F	2.4	17.4	1.00	4.63	6.98	6.8
Approach		169	2.0	169	2.0	1.180	235.9	LOS F	2.4	17.4	1.00	4.63	6.98	6.8
All Vehicles		1792	2.0	1792	2.0	1.180	26.7	LOS F	2.7	19.0	0.14	0.52	0.71	40.5

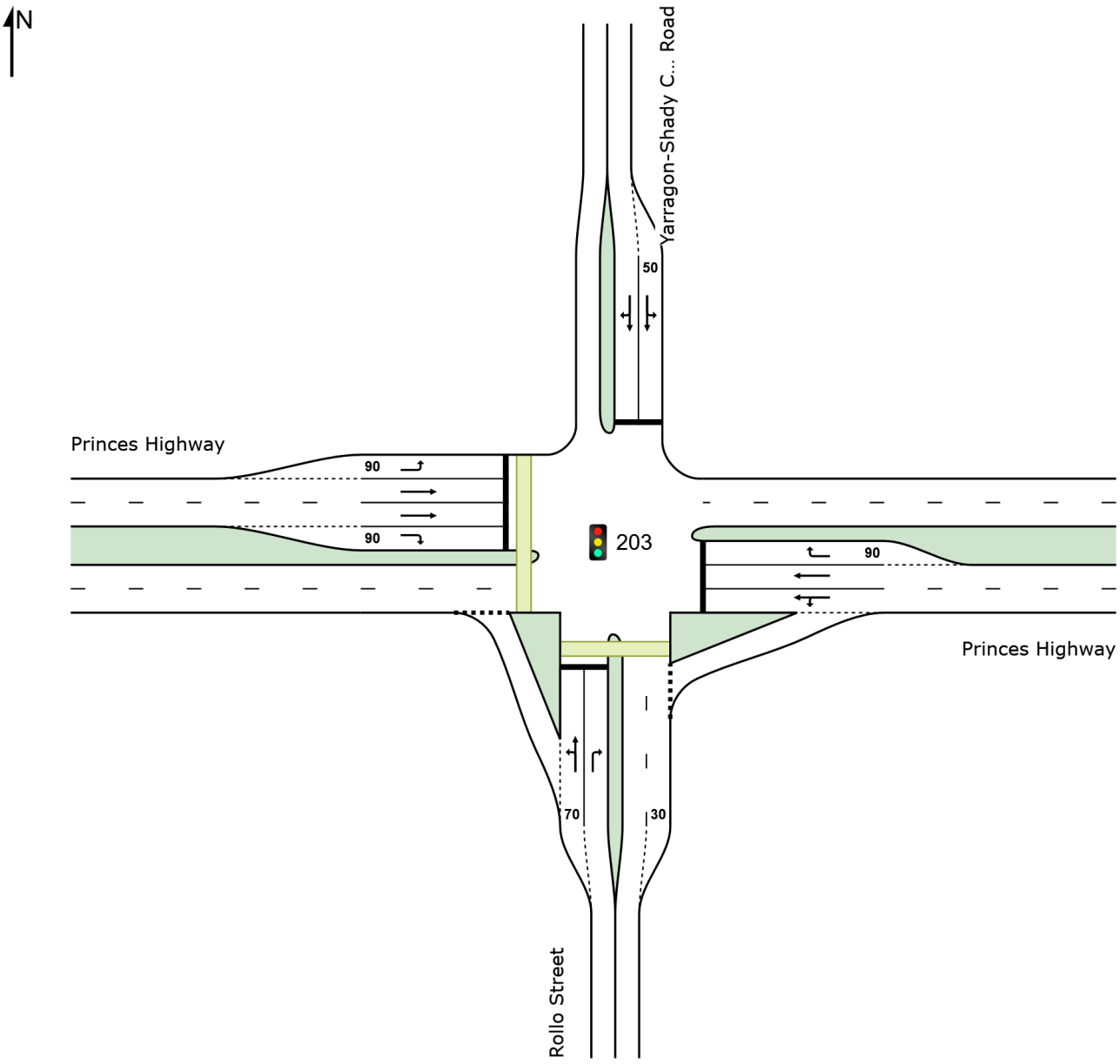
Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 203 [PrinRollYarrPMFut (Site Folder: Wednesday PM Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
PM Peak Hour, Future Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 203 [PrinRollYarrPMFut (Site Folder: Wednesday PM Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
PM Peak Hour, Future Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Degree of Saturation)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Rollo Street														
1	L2	82	2.0	86	2.0	0.253	20.9	LOS A	4.4	31.6	0.65	0.69	0.65	45.1
2	T1	32	2.0	34	2.0	0.253	15.3	LOS A	4.4	31.6	0.65	0.69	0.65	45.6
3	R2	166	2.0	175	2.0	* 0.679	69.3	LOS B	12.3	87.6	0.99	0.84	1.01	27.8
Approach		280	2.0	295	2.0	0.679	49.0	LOS B	12.3	87.6	0.85	0.78	0.86	33.0
East: Princes Highway														
4	L2	209	2.0	220	2.0	0.680	25.3	LOS B	35.5	252.4	0.72	0.73	0.72	44.2
5	T1	1266	2.0	1333	2.0	* 0.680	20.7	LOS B	37.2	264.6	0.73	0.70	0.73	44.4
6	R2	11	2.0	12	2.0	0.063	72.0	LOS A	0.8	5.5	0.93	0.68	0.93	27.1
Approach		1486	2.0	1564	2.0	0.680	21.7	LOS B	37.2	264.6	0.73	0.70	0.73	44.2
North: Yarragon-Shady Creek Road														
7	L2	19	2.0	20	2.0	0.063	53.9	LOS A	1.5	10.6	0.82	0.68	0.82	31.7
8	T1	21	2.0	22	2.0	0.230	54.0	LOS A	4.4	31.4	0.87	0.73	0.87	30.8
9	R2	52	2.0	55	2.0	0.230	61.7	LOS A	4.4	31.4	0.89	0.75	0.89	29.9
Approach		92	2.0	97	2.0	0.230	58.3	LOS A	4.4	31.4	0.87	0.73	0.87	30.4
West: Princes Highway														
10	L2	46	2.0	48	2.0	0.045	18.8	LOS A	1.4	10.2	0.44	0.67	0.44	44.8
11	T1	970	2.0	1021	2.0	0.447	17.7	LOS A	20.2	143.7	0.60	0.54	0.60	46.5
12	R2	121	2.0	127	2.0	* 0.696	79.2	LOS B	9.4	67.1	1.00	0.83	1.07	25.8
Approach		1137	2.0	1197	2.0	0.696	24.3	LOS B	20.2	143.7	0.63	0.57	0.64	42.8
All Vehicles		2995	2.0	3153	2.0	0.696	26.4	LOS B	37.2	264.6	0.71	0.66	0.71	41.7

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Intersection and Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Rollo Street												
P1	Full	50	53	12.0	LOS B	0.1	0.1	0.40	0.40	43.0	37.2	0.86

West: Princes Highway											
P4 Full	50	53	48.9	LOS E	0.2	0.2	0.81	0.81	85.4	43.8	0.51
All Pedestrians	100	105	30.5	LOS D	0.2	0.2	0.60	0.60	64.2	40.5	0.63

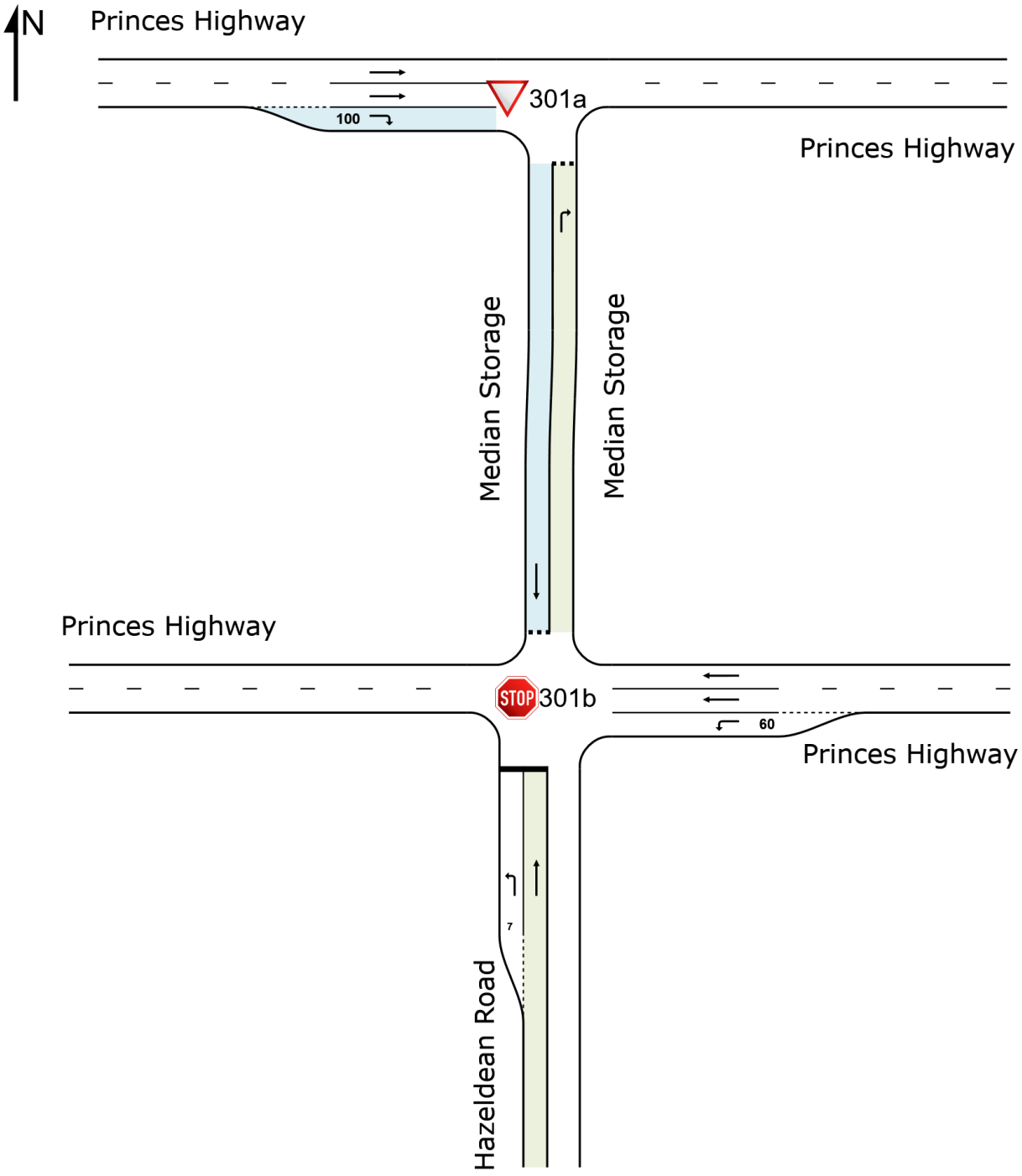
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N301 [PrinHazeSATFut-Network (Network Folder: Saturday Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
301a	NA	PrinHazeSATFut-north
301b	NA	PrinHazeSATFut-south

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 301a [PrinHazeSATFut-north (Site Folder: Saturday Peak Hour)]

Network: N301 [PrinHazeSATFut-Network (Network Folder: Saturday Peak Hour)]

Princes Hwy / Hazeldean Rd - north section
SAT Peak Hour, Future Conditions

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	25	2.0	25	2.0	0.058	7.2	LOS A	0.2	1.2	0.71	0.77	0.71	43.3
Approach		25	2.0	25	2.0	0.058	7.2	LOS A	0.2	1.2	0.71	0.77	0.71	43.3
West: Princes Highway														
2	T1	1174	2.0	1174	2.0	0.305	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	120	2.0	120	2.0	0.103	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach		1294	2.0	1294	2.0	0.305	0.6	LOS A	0.0	0.0	0.00	0.06	0.00	59.3
All Vehicles		1319	2.0	1319	2.0	0.305	0.7	LOS A	0.2	1.2	0.01	0.07	0.01	59.1

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: ONE MILE GRID | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 1:36:17 PM
Project: N:\Projects\2021\210823\Sidra\210823SID002A-Future.sip9

MOVEMENT SUMMARY

Site: 301b [PrinHazeSATFut-south (Site Folder: Saturday Peak Hour)]

Network: N301 [PrinHazeSATFut-Network (Network Folder: Saturday Peak Hour)]

Princes Hwy / Hazeldean Rd - south section
SAT Peak Hour, Future Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hazeldean Road														
1	L2	121	2.0	121	2.0	0.169	11.8	LOS A	0.7	4.6	0.57	0.99	0.57	49.9
2	T1	25	2.0	25	2.0	0.345	74.1	LOS A	1.2	8.5	0.95	1.03	1.09	18.0
Approach		146	2.0	146	2.0	0.345	22.5	LOS A	1.2	8.5	0.64	0.99	0.66	42.7
East: Princes Highway														
3	L2	33	2.0	33	2.0	0.018	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1172	2.0	1172	2.0	0.304	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1204	2.0	1204	2.0	0.304	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
North: Median Storage														
5	T1	120	2.0	120	2.0	0.469	20.8	LOS A	2.1	14.9	0.89	1.12	1.24	33.2
Approach		120	2.0	120	2.0	0.469	20.8	LOS A	2.1	14.9	0.89	1.12	1.24	33.2
All Vehicles		1471	2.0	1471	2.0	0.469	4.1	LOS A	2.1	14.9	0.14	0.20	0.17	55.6

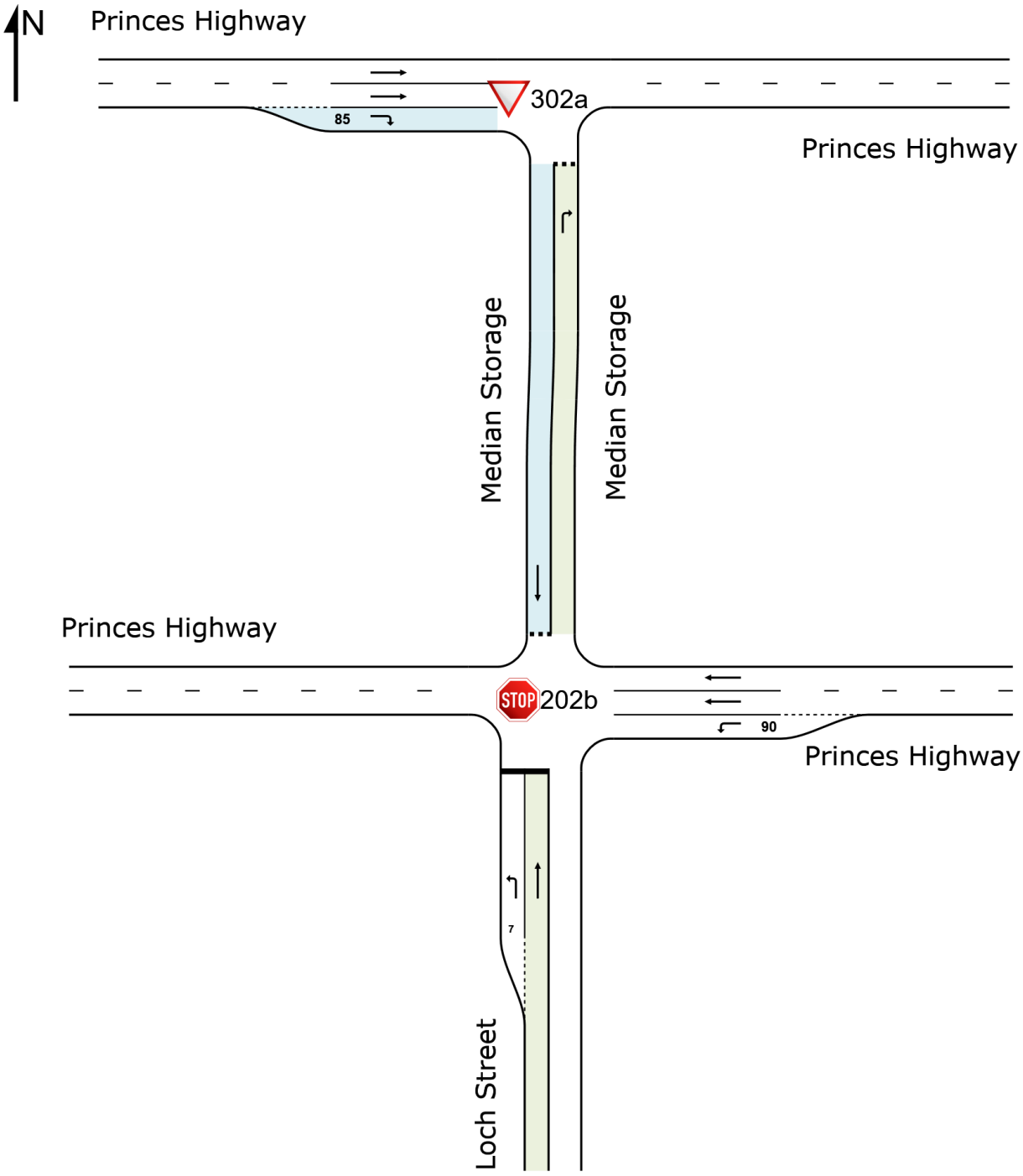
Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N302 [PrinLochSATFut-Network (Network Folder: Saturday Peak Hour)]

Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
302a	NA	PrinLochSATFut-north
202b	NA	PrinLochSATFut-south

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 302a [PrinLochSATFut-north (Site Folder: Saturday Peak Hour)]

Network: N302 [PrinLochSATFut-Network (Network Folder: Saturday Peak Hour)]

Princes Hwy / Loch St - north section
SAT Peak Hour, Future Conditions

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

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	23	2.0	23	2.0	0.044	5.7	LOS A	0.1	0.9	0.64	0.72	0.64	44.9
Approach		23	2.0	23	2.0	0.044	5.7	LOS A	0.1	0.9	0.64	0.72	0.64	44.9
West: Princes Highway														
2	T1	1028	2.0	1028	2.0	0.267	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	156	2.0	156	2.0	0.085	5.8	LOS A	0.0	0.2	0.00	0.63	0.00	50.5
Approach		1184	2.0	1184	2.0	0.267	0.8	LOS A	0.0	0.2	0.00	0.08	0.00	59.1
All Vehicles		1207	2.0	1207	2.0	0.267	0.9	LOS A	0.1	0.9	0.01	0.10	0.01	58.9

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: ONE MILE GRID | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 1:37:10 PM
Project: N:\Projects\2021\210823\Sidra\210823SID002A-Future.sip9

MOVEMENT SUMMARY

Site: 202b [PrinLochSATFut-south (Site Folder: Saturday Peak Hour)]

Network: N302 [PrinLochSATFut-Network (Network Folder: Saturday Peak Hour)]

Princes Hwy / Loch St - south section
SAT Peak Hour, Future Conditions
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Loch Street														
1	L2	164	2.0	164	2.0	0.212	11.4	LOS A	0.9	6.1	0.56	0.98	0.56	50.2
2	T1	23	2.0	23	2.0	0.258	57.2	LOS A	0.9	6.3	0.93	1.02	1.02	21.5
Approach		187	2.0	187	2.0	0.258	17.1	LOS A	0.9	6.3	0.61	0.98	0.62	46.1
East: Princes Highway														
3	L2	35	2.0	35	2.0	0.019	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
4	T1	1065	2.0	1065	2.0	0.277	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1100	2.0	1100	2.0	0.277	0.3	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
North: Median Storage														
5	T1	156	2.0	156	2.0	0.505	18.0	LOS A	2.4	17.4	0.87	1.16	1.30	34.9
Approach		156	2.0	156	2.0	0.505	18.0	LOS A	2.4	17.4	0.87	1.16	1.30	34.9
All Vehicles		1443	2.0	1443	2.0	0.505	4.3	LOS A	2.4	17.4	0.17	0.27	0.22	55.2

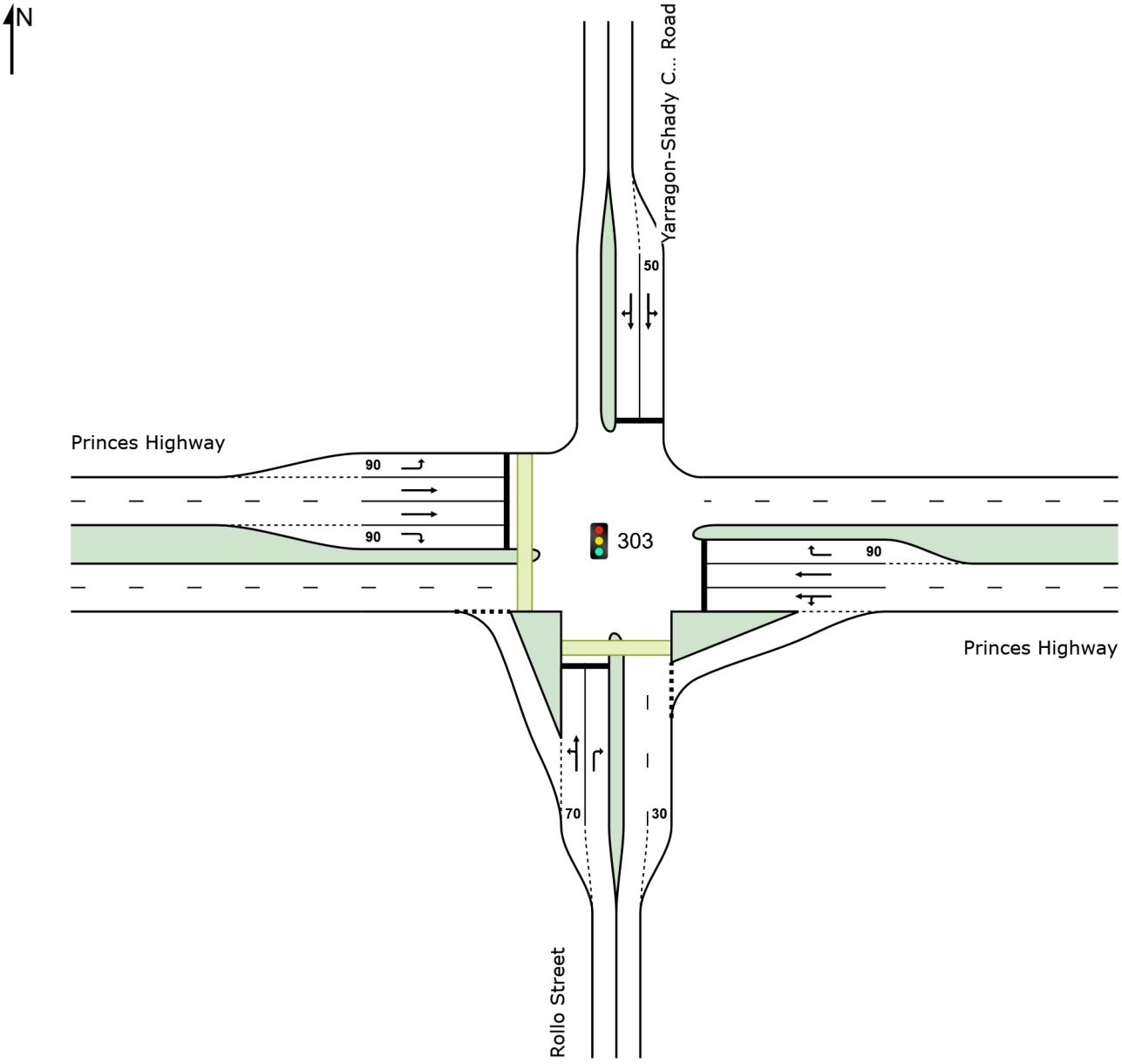
Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Minor Road Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 303 [PrinRollYarrSATFut (Site Folder: Saturday Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
SAT Peak Hour, Future Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 303 [PrinRollYarrSATFut (Site Folder: Saturday Peak Hour)]

Princes Hwy / Rollo St / Yarragon-Shady Creek Rd
SAT Peak Hour, Future Conditions
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Degree of Saturation)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Rollo Street														
1	L2	120	2.0	126	2.0	0.210	13.4	LOS A	3.7	26.6	0.46	0.64	0.46	49.3
2	T1	23	2.0	24	2.0	0.210	7.7	LOS A	3.7	26.6	0.46	0.64	0.46	49.9
3	R2	199	2.0	209	2.0	* 0.587	58.9	LOS A	13.6	96.6	0.93	0.83	0.93	30.2
Approach		342	2.0	360	2.0	0.587	39.5	LOS A	13.6	96.6	0.73	0.75	0.73	36.1
East: Princes Highway														
4	L2	246	2.0	259	2.0	0.588	24.4	LOS A	25.2	179.7	0.71	0.73	0.71	44.2
5	T1	898	2.0	945	2.0	* 0.588	22.9	LOS A	28.8	205.1	0.73	0.69	0.73	43.2
6	R2	9	2.0	9	2.0	0.052	71.9	LOS A	0.6	4.5	0.93	0.68	0.93	27.2
Approach		1153	2.0	1214	2.0	0.588	23.6	LOS A	28.8	205.1	0.73	0.70	0.73	43.2
North: Yarragon-Shady Creek Road														
7	L2	6	2.0	6	2.0	0.032	48.5	LOS A	0.8	6.0	0.77	0.61	0.77	34.0
8	T1	16	2.0	17	2.0	0.117	44.4	LOS A	2.6	18.4	0.78	0.65	0.78	33.8
9	R2	37	2.0	39	2.0	0.117	51.7	LOS A	2.6	18.4	0.80	0.71	0.80	32.4
Approach		59	2.0	62	2.0	0.117	49.4	LOS A	2.6	18.4	0.80	0.69	0.80	32.9
West: Princes Highway														
10	L2	27	2.0	28	2.0	0.029	23.3	LOS A	1.0	6.9	0.50	0.67	0.50	42.5
11	T1	853	2.0	898	2.0	0.443	23.1	LOS A	19.8	141.3	0.66	0.59	0.66	43.5
12	R2	99	2.0	104	2.0	* 0.569	77.0	LOS A	7.5	53.4	1.00	0.79	1.00	26.2
Approach		979	2.0	1031	2.0	0.569	28.5	LOS A	19.8	141.3	0.69	0.61	0.69	40.8
All Vehicles		2533	2.0	2666	2.0	0.588	28.3	LOS A	28.8	205.1	0.72	0.67	0.72	40.9

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on degree of saturation per movement.
Intersection and Approach LOS values are based on worst degree of saturation for any vehicle movement.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Rollo Street												
P1	Full	50	53	16.4	LOS B	0.1	0.1	0.47	0.47	47.4	37.2	0.79

West: Princes Highway											
P4	Full	50	53	41.2	LOS E	0.2	0.2	0.74	0.74	77.7	43.8	0.56
All Pedestrians		100	105	28.8	LOS C	0.2	0.2	0.60	0.60	62.5	40.5	0.65

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.