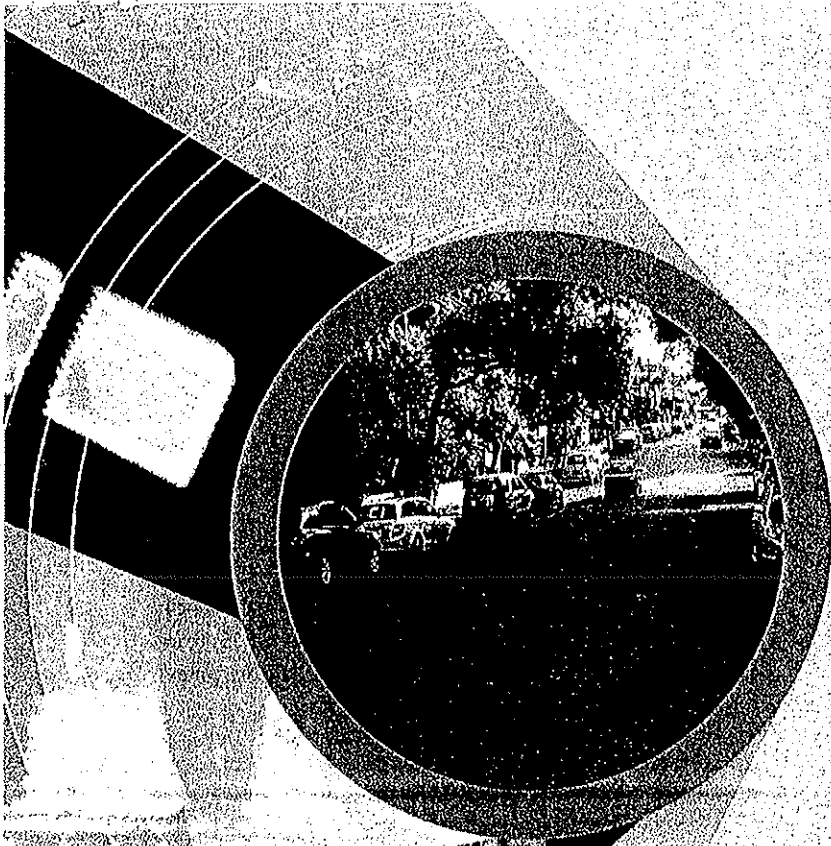


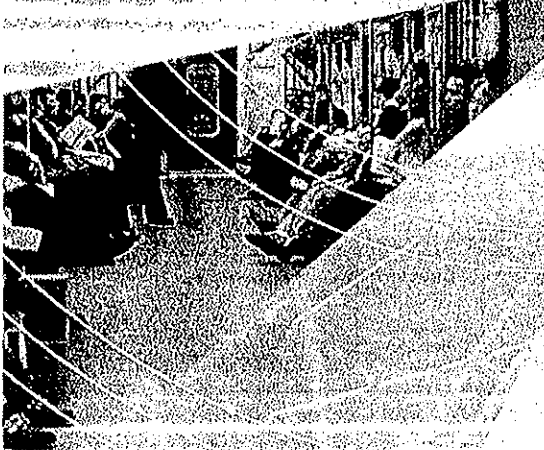


APPENDIX 3

Report on Pymble Business Park Transport Assessment of Access Improvements



Pymble Business Park
Transport Assessment of Access
Improvements



Pymble Business Park

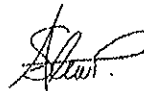
Transport Assessment of Access Improvements

Client: Ku-ring-gai Council

Reference: JS11530

GTA Consultants Office: Sydney

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By
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Table of Contents

1. Introduction	1
1.1 Background	1
1.2 Purpose of this Report	1
1.3 References	1
2. Existing Conditions	3
2.1 Road Network	4
2.2 Traffic Volumes	4
2.3 Intersection Operation	6
2.4 Public Transport	8
2.5 Pedestrian Infrastructure	9
3. Intersection Improvement Options	10
3.1 Pacific Highway/Ryde Road/Mona Vale Road	10
3.2 Pacific Highway/Bridge Street	11
3.3 Ryde Road/West Street	11
4. Traffic Impact Assessment	13
4.1 Future Growth Estimate	13
4.2 Traffic Generation	13
4.3 Trip Distribution and Assignment	13
5. Modelling Methodology	16
5.1 Introduction	16
5.2 Modelling Packages	16
5.3 Model Calibration	18
5.4 Future Traffic Growth	18
6. Modelling Results	19
6.1 Scenario 1	19
6.2 Scenario 2	21
6.3 Scenario 3	24
6.4 Scenario 4	27
6.5 Total Intersection and Network Operation Results	29
6.6 Future Bus Stops	30
7. Conclusions	31

Appendices

- A: LinSig Modelling Results
- B: SIDRA INTERSECTION Modelling Result

Table of Contents

C: Intersection Improvement Options

Figures

Figure 2.1: Pymble Business Park and Its Environs	3
Figure 2.2: Weekday AM Peak-Hour (7:30am – 8:30am)	5
Figure 2.3: Weekday PM Peak-Hour (4:30pm – 5:30pm)	6
Figure 3.1: Intersection Improvements – Pacific Highway/Ryde Road/Mona Vale Road	10
Figure 3.2: Intersection Improvements – Pacific Highway/Bridge Street	11
Figure 3.3: Intersection Improvements – Ryde Road/West Street	12
Figure 4.1: Development Traffic Distribution and Assignment – Weekday AM Peak	14
Figure 4.2: Development Traffic Distribution and Assignment – Weekday PM Peak	15

Tables

Table 2.1: 2011 AM/PM Base – Pacific Highway/Ryde Road/Mona Vale Road	7
Table 2.2: 2011 AM/PM Base – Pacific Highway/Bridge Street	8
Table 2.3: 2011 AM/PM Base – Ryde Road/West Street	8
Table 2.4: Public Transport Provision	9
Table 5.1: Modelling Scenarios	16
Table 5.2: SIDRA INTERSECTION Level of Service Criteria	18
Table 6.1: Scenario 1 – Pacific Highway/Ryde Road/Mona Vale Road (Optimised Results)	20
Table 6.2: Scenario 1 – Pacific Highway/Bridge Street (Optimised Results)	21
Table 6.3: Scenario 1 – Ryde Road/West Street	21
Table 6.4: Scenario 2 – Pacific Highway/Ryde Road/Mona Vale Road (Optimised Results)	22
Table 6.5: Scenario 2 – Pacific Highway/Bridge Street (Optimised Results)	23
Table 6.6: Scenario 2 – Ryde Road/West Street (Optimised Results)	24
Table 6.7: Scenario 3 – Pacific Highway/Ryde Road/Mona Vale Road (Optimised Results)	25
Table 6.8: Scenario 3 – Pacific Highway/Bridge Street (Optimised Results)	26
Table 6.9: Scenario 3 – Ryde Road/West Street (Optimised Results)	26
Table 6.10: Scenario 4 – Pacific Highway/Ryde Road/Mona Vale Road (Optimised Results)	27
Table 6.11: Scenario 4 – Pacific Highway/Bridge Street (Optimised Results)	28
Table 6.12: Scenario 4 – Ryde Road/West Street (Optimised Results)	29
Table 6.13: Summary of Overall Intersection Operation	30

1. Introduction

1.1 Background

Pymble Business Park, located in Sydney's Upper North Shore, comprises a range of land uses including office, business park, freight and logistics, and local light industry, and has been identified in the draft *North Subregional Strategy* (Department of Planning, 2007) as an existing business concentration in the north subregion.

Pymble Business Park is bounded by residential land uses to the north, the Pacific Highway to the east, Ryde Road to the south, and Bullock Park and residential land uses to the west.

Vehicular access is limited to the following two intersections:

- Pacific Highway/Bridge Street (3-way signalised intersection)
- Ryde Road/West Street (3-way priority intersection – left in/left out from West Street only).

During the preparation of the *Ku-ring-gai LEP (Town Centres) 2010*, Pymble Business Park was identified as an area with future growth potential. Ku-ring-gai Council estimates there is growth potential for an additional 31,000m² of office floor space to 2031 as a result of under-utilised sites existing within the Business Park.

It was also identified that the current vehicular access to and from the Business Park was particularly difficult and that any future growth would only exacerbate the issue without capacity improvements or alternative access arrangements being included.

GTA Consultants was commissioned by Ku-ring-gai Council in February 2011 to undertake a traffic assessment of three Council-developed intersection improvement options in the vicinity of Pymble Business Park.

1.2 Purpose of this Report

The objective of the study was to determine whether the proposed intersection improvements developed by Council improved vehicle access to Pymble Business Park both now and in the future. The analysis included a coordinated review of the following three intersections using LinSig Version 3.0 modelling software.

- Pacific Highway/ Ryde Road/ Mona Vale Road (signalised)
- Pacific Highway/ Bridge Street (signalised)
- Ryde Road/ West Street (priority).

The future modelling scenarios also included the addition of development traffic resulting from the estimated future growth in office floor space within the Business Park as provided by Council.

1.3 References

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

- Ku-ring-gai LEP (Town Centres) 2010
- Ku-ring-gai DCP (Town Centres) 2010
- *Pymble Business Park Traffic and Transport Study* prepared by Ku-ring-gai Council, November 2009
- *Draft Ku-ring-gai Integrated Transport Strategy*

Introduction

- Traffic movement counts and vehicle queue length surveys commissioned by GTA Consultants on 10 February 2011.
- Site visits undertaken during Weekday AM and Weekday PM peak-hours by GTA Consultants on 10 February 2011.
- Letter prepared by the RTA to Ku-ring-gai Council regarding the proposed improvement options at Pymble Business Park dated 14 May 2010 (Ref No: 238.5314 Vol 12 – SYD09/00861).

2. Existing Conditions

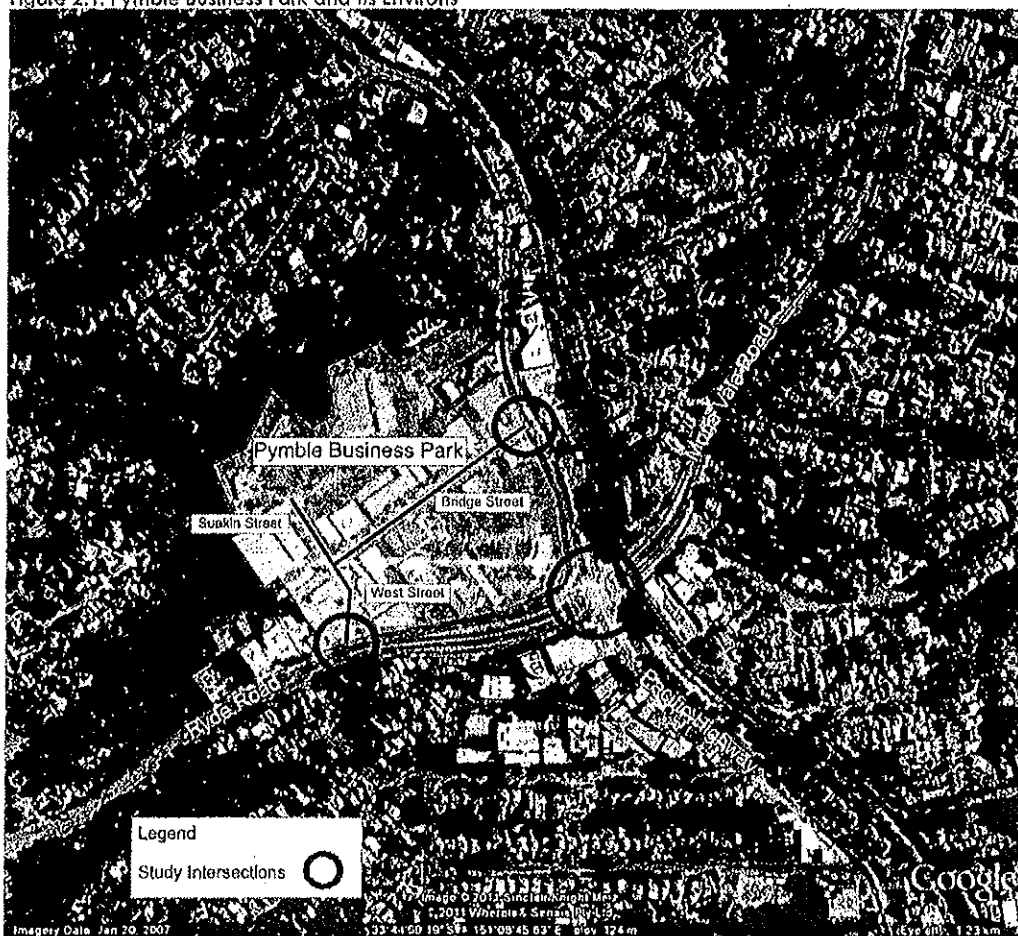
Pymble Business Park comprises an approximate total Gross Floor Area (GFA) of 76,600m² made up of a combination of office, business park, freight and logistics, and local light industry land uses.

The subject site is bounded by residential land uses to the north, the Pacific Highway to the east, Ryde Road to the south, and Bullock Park and residential land uses to the west. Vehicular access is limited to the following two intersections:

- Pacific Highway/Bridge Street (3-way signalised intersection)
- Ryde Road/West Street (3-way priority intersection – left in/left out from West Street only).

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Pymble Business Park and Its Environs



Source: Google

2.1 Road Network

2.1.1 Adjoining Roads

Pacific Highway

Pacific Highway is classified as a State Road by the RTA and is generally aligned in a north-south direction. In the vicinity of the Pymble Business Park, the Pacific Highway is a two-way road configured with 3-lanes each-way and a posted speed limit of 60 km/h.

Ryde Road/Mona Vale Road

Ryde Road/Mona Vale Road is classified as a State Road by the RTA and is generally aligned in an east-west direction. In the vicinity of the Pymble Business Park, Ryde Road/Mona Vale Road is a two-way road configured with 3-lanes each-way and a posted speed limit of 70 km/h.

Ryde Road, just west of West Street, recorded an Annual Average Daily Traffic (AADT) volume of 62,022 vehicles per day in 2005¹.

Bridge Street/West Street/Suakin Street

Bridge Street, West Street and Suakin Street function as local roads within the Pymble Business Park. Bridge Street is aligned in an east-west direction; while West Street and Suakin Street are aligned in a north-south direction. In general, each street is configured with one lane each-way plus kerbside parking on both sides. The posted speed limit on these streets is 50 km/h.

In Bridge Street, West Street and Suakin Street, on-street parking is generally restricted to two hours (2P) between 8:00am and 6:00pm, Monday to Friday.

However in West Street a No Parking restriction applies between 4:00pm and 6:00pm, Monday to Friday along the eastern kerb for the first 40 metres north of the intersection with Ryde Road.

2.1.2 Surrounding Intersections

The following intersections currently exist in the vicinity of the site:

- Pacific Highway/ Ryde Road/ Mona Vale Road (signalised)
- Pacific Highway/ Bridge Street (signalised)
- Ryde Road/ West Street (priority).

2.2 Traffic Volumes

GTA Consultants commissioned traffic movement counts at the three study intersections on Thursday 10 February 2011 during the following peak periods:

- 7:00am and 9:00am
- 4:00pm and 6:00pm.

¹ RTA Statlon No. 53.021

Existing Conditions

Following analysis of the survey data, it was identified that the combined network peak of the three study intersections occurred:

- between 7:30am and 8:30am during the Weekday AM peak-hour
- between 4:30pm and 5:30pm during the Weekday PM peak-hour.

The identified Weekday AM and Weekday PM peak-hours are presented in Figure 2.2 and Figure 2.3.

Figure 2.2: Weekday AM Peak-Hour (7:30am – 8:30am)

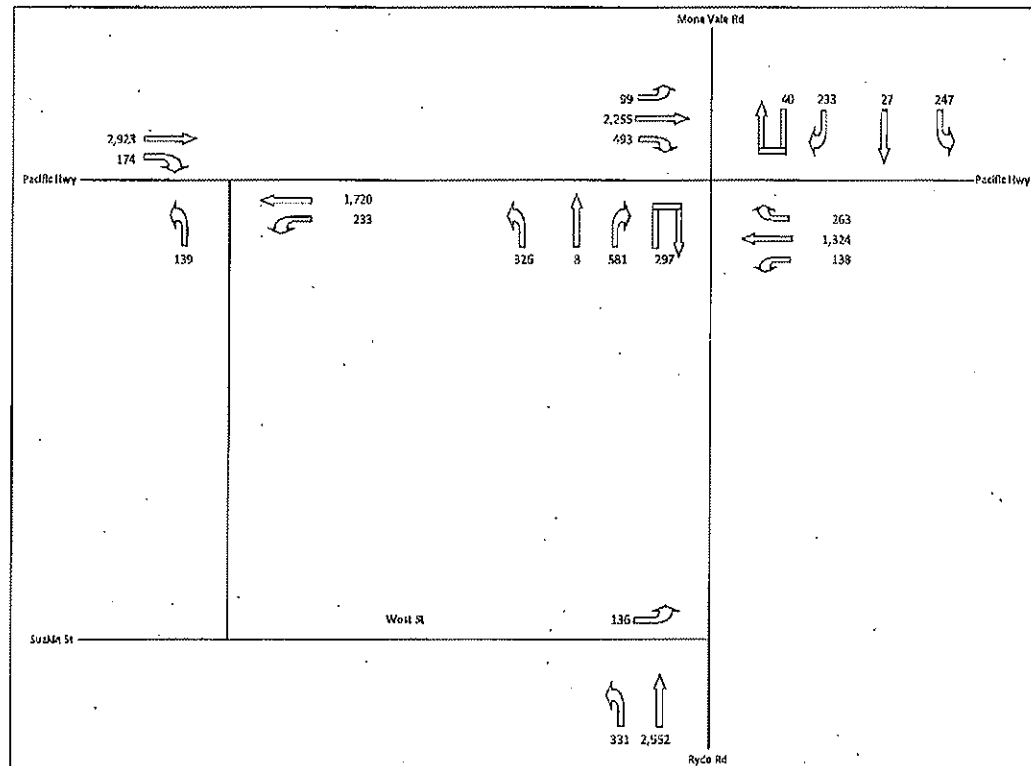
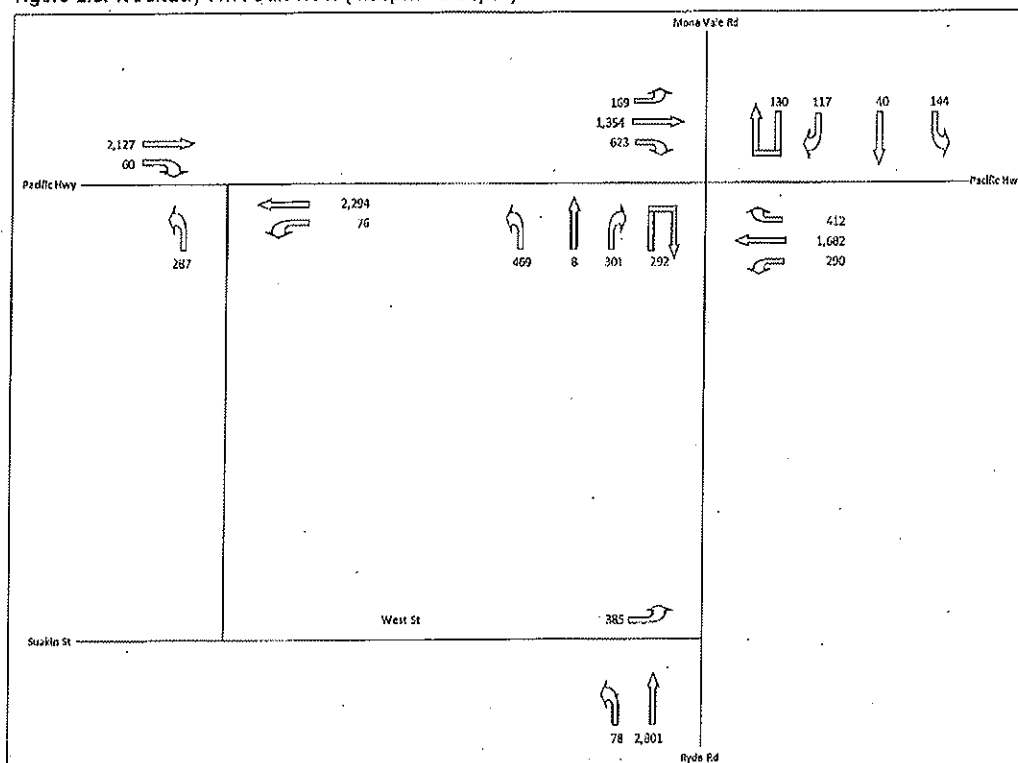


Figure 2.3: Weekday PM Peak-Hour (4:30pm – 5:30pm)



For model calibration purposes, vehicle queue length surveys were also undertaken during the same time periods as the traffic movement counts.

2.3 Intersection Operation

To establish the operational performance of the three study intersections during the identified network peak-hours (2011), the following software packages were used:

- LinSig for Pacific Highway/ Ryde Road/ Mona Vale Road and Pacific Highway/ Bridge Street
- SIDRA INTERSECTION for Ryde Road/ West Street.

The results of the analysis are summarised by intersection in the following Sections, with the LinSig and SIDRA INTERSECTION modelling outputs presented in Appendix A and Appendix B respectively.

2.3.1 Pacific Highway/Ryde Road/Mona Vale Road

Table 2.1 presents a summary of the existing operation of the Pacific Highway/ Ryde Road/ Mona Vale Road signalised intersection during the identified network peak-hours.

Table 2.1: 2011 AM/PM Base – Pacific Highway/Ryde Road/Mona Vale Road

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (left and through)	808	105.5%	174.6	F	382
	Pacific Hwy SB (through) Lane 3,4	1,571	105.4%	174.6	F	357
	Pacific Hwy SB (right) Lane 5,6	502	97.6%	153.5	F	97
	Ryde Rd EB (left, right and through)	481	88.1%	45.8	D	63
	Ryde Rd EB (right)	195	73.1%	80.4	F	51
	Ryde Rd EB (right and U-Turn)	529	88.8%	54.5	E	76
	Pacific Hwy NB (right)	260	106.4%	> 200	F	142
	Pacific Hwy NB (through) Lane 3,4	497	60.3%	38.0	C	87
	Pacific Hwy NB (left and through)	592	66.1%	31.2	C	89
	Mona Vale Rd WB (right and U-Turn)	199	80.6%	87.2	F	52
	Mona Vale Rd WB (right, left and through)	348	88.5%	66.5	E	60
PM	Pacific Hwy SB (left and through)	571	78.2%	42.4	C	117
	Pacific Hwy SB (through) Lane 3,4	996	74.5%	47.1	C	111
	Pacific Hwy SB (right) Lane 5,6	650	72.7%	62.2	E	75
	Ryde Rd EB (left, right and through)	596	81.6%	37.3	C	104
	Ryde Rd EB (right)	75	36.4%	70.2	E	18
	Ryde Rd EB (right and U-Turn)	453	76.1%	40.6	C	45
	Pacific Hwy NB (right)	419	95.8%	109.5	F	136
	Pacific Hwy NB (through) Lane 3,4	1,213	89.1%	62.7	E	155
	Pacific Hwy NB (left and through)	888	93.0%	50.5	D	163
	Mona Vale Rd WB (right and U-Turn)	223	80.3%	66.9	F	36
	Mona Vale Rd WB (right, left and through)	252	82.9%	59.6	E	37

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 2.1 indicates that:

- During the Weekday AM peak hour the Pacific Highway southbound leg of the intersection experiences significant delays for all movements. Pacific Highway northbound also experiences significant delays for vehicles turning right onto Mona Vale Road.
- Ryde Road eastbound approach and Mona Vale Road westbound approach to the Pacific Highway currently experience moderate delays and queuing during the Weekday AM and PM peak hours.
- During the Weekday PM peak hour the Pacific Highway northbound leg of the intersection experiences significant delays and vehicle queuing for all movements.
- These delays and associated queue lengths were also observed during the site visit and documented within the vehicle queue length surveys.

2.3.2 Pacific Highway/Bridge Street

Table 2.2 presents a summary of the existing operation of the Pacific Highway/Bridge Street signalised intersection during the identified network peak-hours.

Existing Conditions

Table 2.2: 2011 AM/PM Base – Pacific Highway/Bridge Street

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (through) Lane 1,2	1,594	44.9%	1.8	A	3
	Pacific Hwy SB (right and through)	1,463	81.3%	11.3	A	49
	Bridge St (left)	141	26.1%	50.8	D	16
	Pacific Highway NB (through) Lane 2,3	1,394	53.1%	4.3	A	18
	Pacific Highway NB (left and through)	554	45.0%	3.2	A	38
PM	Pacific Hwy SB (through) Lane 1,2	1,079	31.7%	1.5	A	1
	Pacific Hwy SB (right and through)	1,199	66.6%	6.0	A	19
	Bridge St (left)	294	90.5%	107.8	F	58
	Pacific Highway NB (through) Lane 2,3	1,740	57.6%	3.7	A	18
	Pacific Highway NB (left and through)	710	50.9%	3.2	A	78

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 2.2 indicates that:

- During the Weekday AM peak hour the Bridge Street leg of the intersection experiences moderate delays for the left turn only movement onto the Pacific Highway.
- During the Weekday PM peak hour the Bridge Street leg of the intersection experiences significant delays and queuing for the left turn only movement onto the Pacific Highway.
- These delays and associated queue lengths were also confirmed during the site visit.

2.3.3 Ryde Road/West Street

Table 2.3 presents a summary of the existing operation of the Ryde Road/West Street priority intersection during the identified network peak-hours.

Table 2.3: 2011 AM/PM Base – Ryde Road/West Street

Intersection	Peak	Leg	Degree of Saturation (DoS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LoS)
Ryde Road/West Street	AM	Ryde Road (W)	0.539	8.8	-	A
		West Street	0.757	55.9	30.9	D
	PM	Ryde Road (W)	0.524	8.7	-	A
		West Street	1.206	243.9	316.0	F

Table 2.3 indicates that:

- During the Weekday AM peak-hour, the West Street leg of the intersection experiences moderate delays for vehicles attempting to turn left onto Ryde Road.
- During the Weekday PM peak-hour, the West Street leg of the intersection experiences significant delays and vehicle queuing for the turn left movement onto Ryde Road.
- These delays and associated queue lengths were also confirmed during the site visit.

2.4 Public Transport

A review of the public transport available in the vicinity of the site is summarised in Table 2.4.

Existing Conditions

Table 2.4: Public Transport Provision

Service	Route No.	Route Description	Location of Stop	Distance to Nearest Stop	Weekday Frequency On/Off Peak
Bus	560	Pymble to Gordon	Ryde Road near Nadene Place	Minimum 500m	15 minutes peak / 1 hour off peak
Bus	195	Gordon to St Ives Chase	Gregory and Carr Funerals (850 Pacific Highway)	Minimum 520m	30 minutes peak / 1 hour off peak
Bus	196	Gordon to Mona Vale	Gregory and Carr Funerals (850 Pacific Highway)	Minimum 520m	30 minutes 6-8am Twice 3:30-5pm 30 minutes 7-10:30pm
Bus	197	Mona Vale to Macquarie University	Ryde Road near West Street	Minimum 100m	15 minutes peak / 30 minutes off peak
Train	n/o	North Shore Line	Pymble Railway Station	Minimum 650m	3-10 minutes peak / 15 minutes off peak
Train	n/a	North Shore Line	Gordon Railway Station	Minimum 900m	3-10 minutes peak / 15 minutes off peak

2.5 Pedestrian Infrastructure

In the vicinity of Pymble Business Park, sealed pedestrian footpaths are located as follows:

- Pacific Highway (both sides)
- Ryde Road (both sides)
- Bridge Street (both sides)
- West Street (both sides)
- Suakin Street (both sides).

Safe crossing points in the vicinity of the Business Park include the following:

- Bridge Street leg of the Pacific Highway/Bridge Street traffic signals
- Eastern and western legs of the Pacific Highway/Ryde Road/Mona Vale Road intersection (combination of marked foot crossings and signalised pedestrian crossings).

3. Intersection Improvement Options

To improve vehicle access into and out of the Pymble Business Park, both now and in the future, Ku-ring-gai Council developed improvement options for the three study intersections. Each option is detailed in the following sections and presented diagrammatically in Appendix C.

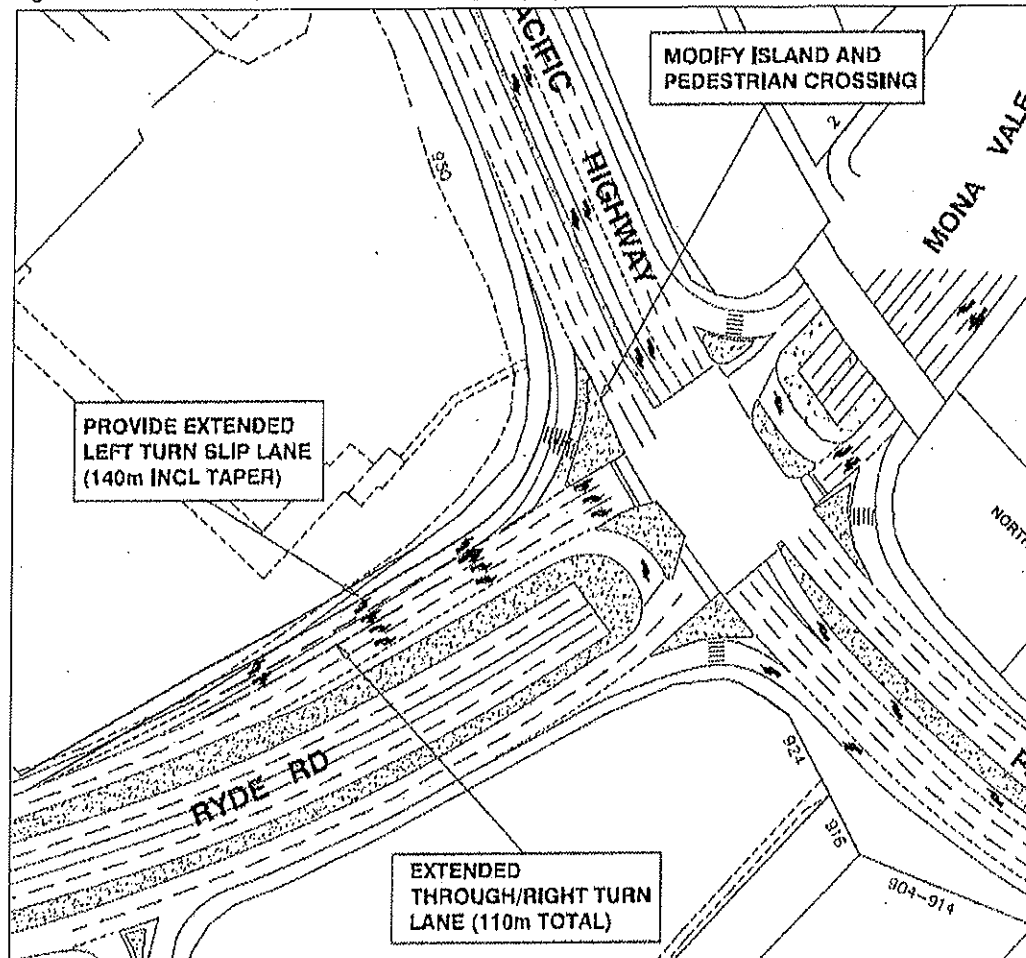
3.1 Pacific Highway/Ryde Road/Mona Vale Road

For the Pacific Highway/Ryde Road/Mona Vale Road signalised intersection, the following improvements are proposed:

- Extension of the left-turn slip lane storage on the Ryde Road off-ramp to 140 metres
- Extension of the through/right-turn lane on the Ryde Road off-ramp to 110 metres.

The proposed improvements are presented in Figure 3.1 below.

Figure 3.1: Intersection Improvements – Pacific Highway/Ryde Road/Mona Vale Road



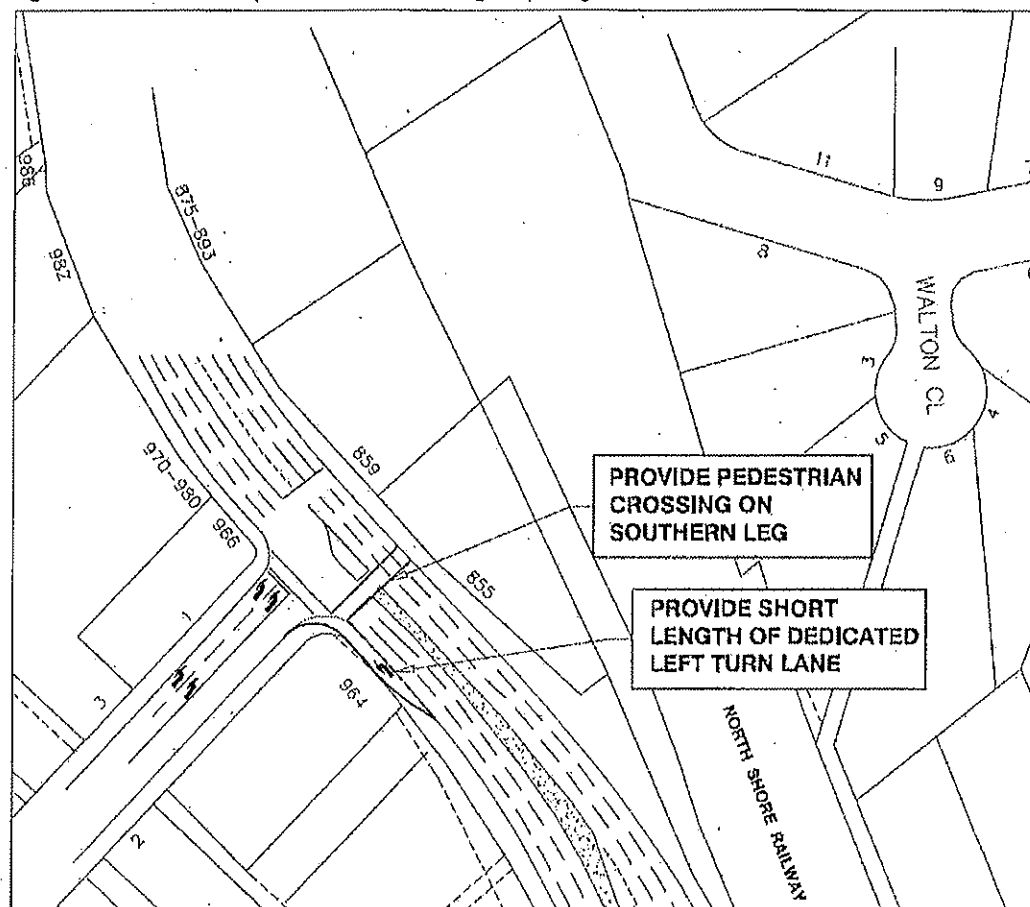
3.2 Pacific Highway/Bridge Street

For the Pacific Highway/Bridge Street signalised intersection, the following improvements are proposed:

- Addition of a 25 metre left-turn bay on the Pacific Highway (S) leg of the Intersection
- Addition of a signal-controlled pedestrian crossing across the Pacific Highway (S) leg of the intersection.

The proposed improvements are presented in Figure 3.2 below.

Figure 3.2: Intersection Improvements – Pacific Highway/Bridge Street



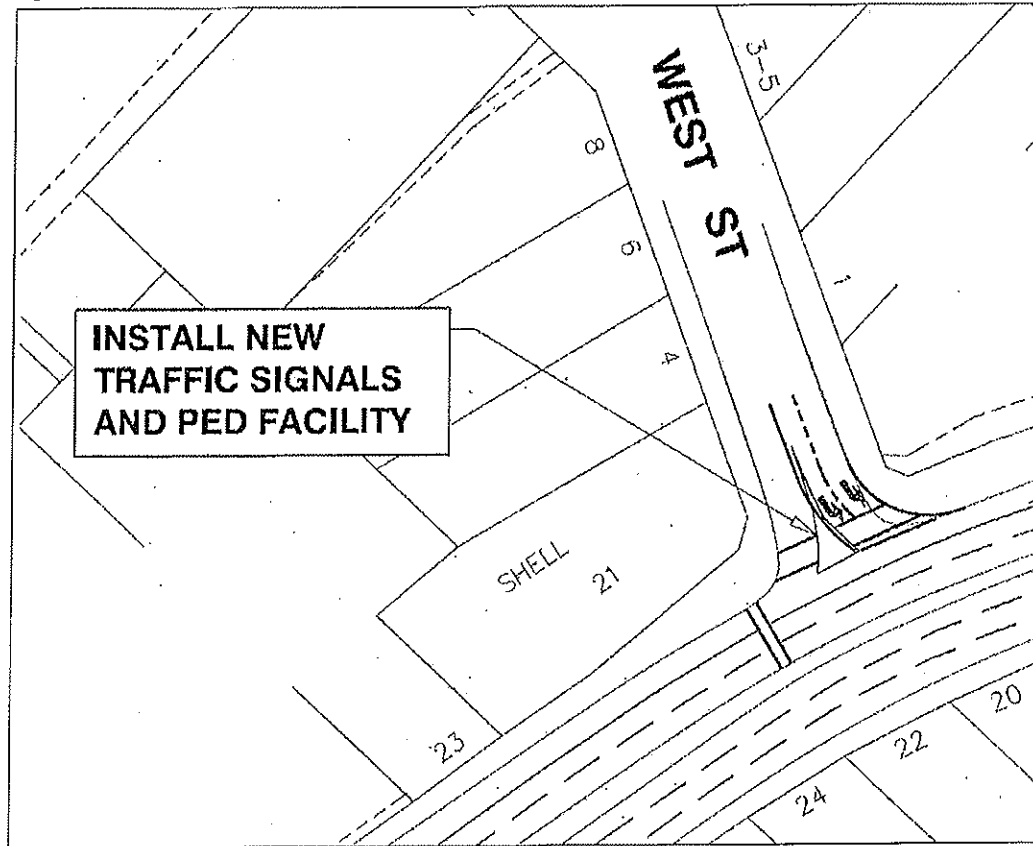
3.3 Ryde Road/West Street

For the Ryde Road/West Street priority intersection, the following improvements are proposed:

- Installation of new traffic signals to control vehicular access into and out of West Street
- Addition of a second left-turn only lane on the West Street leg
- Addition of a signal-controlled pedestrian crossing across the West Street leg of the intersection.

The proposed improvements are presented in Figure 3.3.

Figure 3.3: Intersection Improvements – Ryde Road/West Street



4. Traffic Impact Assessment

4.1 Future Growth Estimate

Ku-ring-gai Council have estimated that there is growth potential for an additional 31,000m² of office floor space up to 2031 which was based on the findings of the Ku-ring-gai and Hornsby Subregional Employment Lands Study (KHSELS), and consideration of current under-utilised sites within Pymble Business Park.

To present a robust analysis of the proposed access improvements, it has been assumed for modelling purposes that the additional 31,000m² of office floor space would be delivered by 2021.

4.2 Traffic Generation

For business parks, the RTA's Guide to Traffic Generating Developments (Version 2.2, October 2002) recommends the following trip generation rates:

Peak Vehicle Trips (PVT) = 1.2 vehicle trips / hour / 100m² of GLFA⁽²⁾

where 'GLFA' represents the Gross Leasable Floor Area

Assuming that the GLFA represents 80% of the Gross Floor Area (GFA), application of the RTA rates to the full growth potential of Pymble Business Park (31,000m²) would generate an additional 298 vehicle trips during the Weekday AM and PM peak-hours.

4.3 Trip Distribution and Assignment

Council's *Pymble Business Park Traffic and Transport Study* indicates that during the Weekday AM peak (0730-0830), 75% of development traffic would be inbound and 25% of development traffic would be outbound.

Conversely during the Weekday PM peak (1630-1730), 25% of development traffic would be inbound and 75% of development traffic would be outbound.

Application of these in/out percentage splits to the estimated development traffic would result in:

- Weekday AM Peak – 224 vehicles inbound, 74 vehicles outbound
- Weekday PM Peak – 74 vehicles inbound, 224 vehicles outbound.

Future development traffic associated with Pymble Business Park has been assigned across the wider road network using the following assumptions:

- 40% to/from the north via Pacific Highway
- 20% to/from east via Mona Vale Road
- 20% to/from south via Pacific Highway
- 20% to/from west via Ryde Road.

These percentage splits generally correlate with the findings of the *Draft Ku-ring-gai Integrated Transport Strategy* which determined that the majority of work trips to the Ku-ring-gai Local Government Area (LGA)

² Trip rate and GFA to GLFA conversion factor extracted from *Pymble Business Park Traffic and Transport Study* prepared by Ku-ring-gai Council, November 2009

originate from either within the Ku-ring-gai LGA or from the Hornsby LGA. Hence the greater percentage of development trips assigned to/from the north.

A summary of the trip distribution and assignment of development traffic is presented diagrammatically in Figure 4.1 and Figure 4.2.

Figure 4.1: Development Traffic Distribution and Assignment – Weekday AM Peak

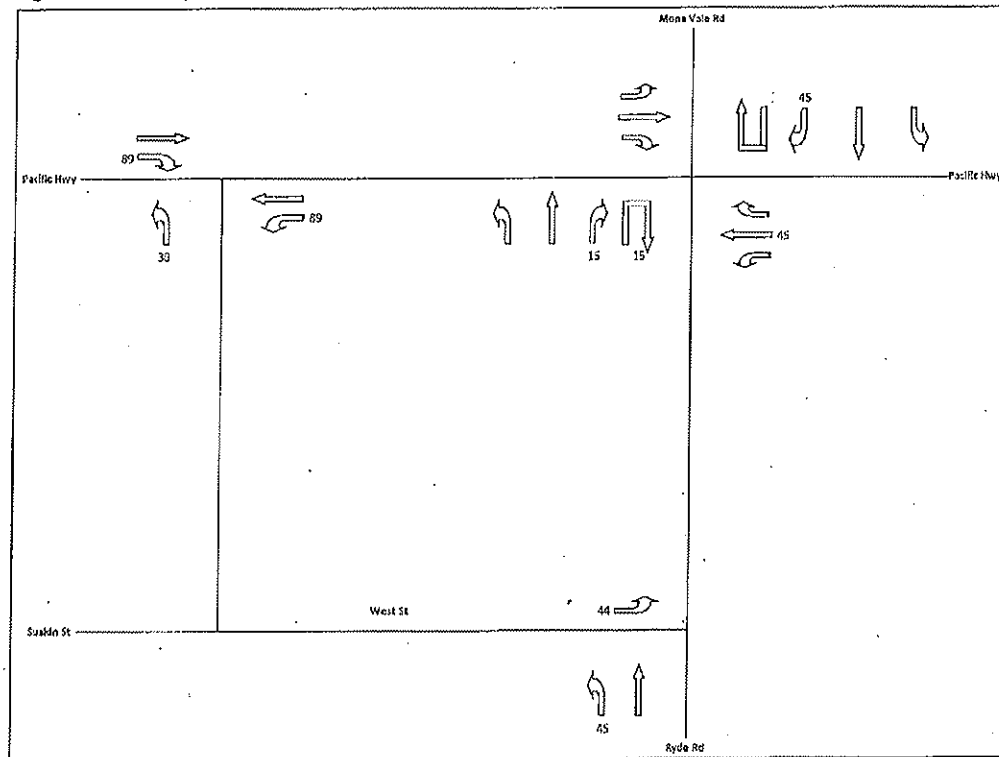
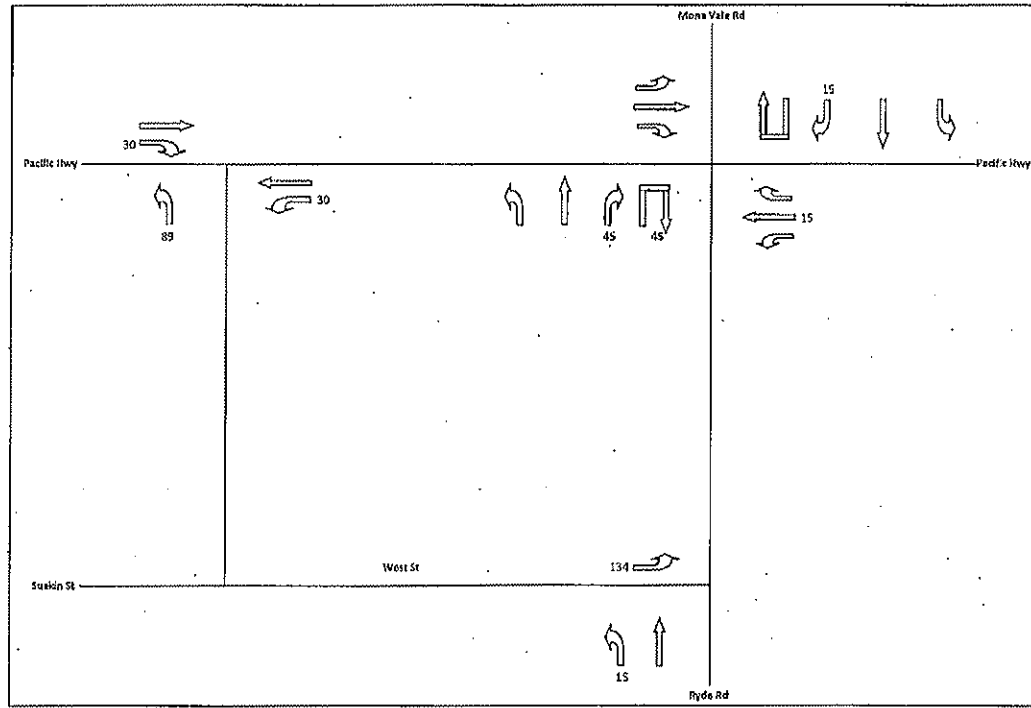


Figure 4.2: Development Traffic Distribution and Assignment – Weekday PM Peak



5. Modelling Methodology

5.1 Introduction

The modelling analysis included an assessment of the following three (3) study intersections:

- Pacific Highway/ Ryde Road/ Mona Vale Road (4-way signalised intersection)
- Pacific Highway/ Bridge Street (3-way signalised intersection)
- Ryde Road/ West Street (3-way priority intersection – left in/ left out from West Street only).

Intersection capacity assessments were undertaken for the Weekday AM (7:30-8:30) and Weekday PM (4:30-5:30) peak-hours for the following five (5) scenarios presented in Table 5.1 below.

Table 5.1: Modelling Scenarios

Title	Description
Existing	2011 Base (presented in Section 2.3)
Scenario 1	2021 Base + Background Growth + Development ('Do Nothing' scenario)
Scenario 2	2021 Base + Background Growth + Development + Intersection Improvements
Scenario 3	2021 Base + Background Growth + Development + Intersection Improvements + Right-Turn Phase at Bridge Street
Scenario 4	2021 Base + Background Growth + Development + Intersection Improvements + Ryde Road (EB) Off-Ramp Improvements

It should be noted that from Scenario 2 to Scenario 4, the intersection of Ryde Road/West Street is modelled as a signal-controlled intersection with two left turn lanes on the West Street leg (as per Figure 3.3).

Furthermore for Scenario 3, with the addition of a right-turn from Bridge Street onto Pacific Highway (S), there was a need to reassign both growthed base traffic flows and future development traffic associated with the increased office floor space. For simplicity, the following assumptions were adopted:

- Growthed base traffic flows recorded for the left-turn movement from West Street onto Ryde Road (E) were split 50/50 between the left-turn movement at West Street and the modelled right-turn movement at Bridge Street onto Pacific Highway (S).
- Future development traffic assigned to the left-turn movement from West Street onto Ryde Road (E) (Future Weekday AM = 44 veh/hr; Future Weekday PM = 134 veh/hr) were also split 50/50 between the left-turn movement at West Street and the modelled right-turn movement at Bridge Street onto Pacific Highway (S).

These modelling assumptions were considered to be reasonable as 50% of businesses would be accessed via West Street/Suakin Street and 50% of businesses would be accessed via Bridge Street.

5.2 Modelling Packages

5.2.1 LinSig

LinSig is a computer software package for the assessment and design of traffic signal intersections either individually or as a network comprised of multiple intersections. It is generally used to construct a model of the intersection or network which can then be used to assess different designs and methods of operation. Apart from stand-alone intersections, it is used for multiple traffic signal intersections, complex networks, signalised roundabouts, and road networks which may include traffic signal pedestrian crossings and priority intersections as well as traffic signal intersections.

For the purpose of the LinSig analysis, the following assumptions have been made:

- Given that traffic flows in LinSig are presented in Passenger Car Units (PCU), the following conversion was adopted for the existing traffic volumes:
 - Car = 1 PCU
 - Heavy Goods Vehicle = 2.3 PCUs
- Saturation flow values of 1,800 pcus/h have been adopted for through and turning lanes. Generally, saturation flow should be measured on site for each lane or group of lanes for each peak period. Given that no site measurements have been undertaken as part of this project, basic saturation flows have been based on the geometric settings of a typical lane in the study area.
- Given that saturation flow is dependent on a number of factors including the site conditions and the proportion of heavy vehicles, it is expected that the values adopted for the analysis are both conservative and consistent with the Austroads classifications for lane saturation flows.
- Lane lengths have been based on the existing intersection layout with short lanes used to represent how road space is currently used.
- Phase sequence arrangements, durations and cycle times for the base models have been based on the Intersection Diagnostic Monitor (IDM) data provided by RTA.
- A start lag of 5 seconds has been applied to vehicle movements that run simultaneously with pedestrian movements (i. e. left and right turning movements) to represent the delay to vehicles caused by pedestrians.

It should be noted that the 2011 Base scenario, the Pacific Highway/ Ryde Road/ Mona Vale Road and Pacific Highway/ Bridge Street signalised intersections were calibrated in LinSig using IDM data collected by the RTA.

For all future scenarios (Scenario 1 through to Scenario 4) however, all signalised intersections were optimised within LinSig.

5.2.2 SIDRA INTERSECTION

The operation of the Ryde Road/West Street priority intersection was assessed using SIDRA INTERSECTION³, a computer based modelling package which calculates intersection performance, in the 2011 Base and Scenario 1.

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

Table 5.2 shows the criteria that SIDRA-INTERSECTION adopts in assessing the level of service.

³ Program used under license from Akcelik & Associates Pty Ltd.

Table 5.2: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

5.3 Model Calibration

Each study intersection was calibrated for the 2011 Base scenario using a combination of the following data sources:

- Vehicle queue length surveys
- Recent turn count data
- IDM data provided by the RTA for the 2 existing signalised intersections
- Observations of traffic behaviour and vehicle queuing recorded during site visits.

Where traffic behaviour and vehicle queuing observations recorded during the site visit did not correlate with the vehicle queue length surveys, the vehicle queue length surveys were used as the primary source for base model calibration.

5.4 Future Traffic Growth

To establish the future traffic volumes associated with the 2011 modelling scenarios, annual growth factors were applied to the 2011 turn count data. The following annual growth rates, as provided by the RTA, were applied:

- Pacific Highway – 0.6% per annum
- Ryde Road/ Mona Vale Road – 0.8% per annum.

6. Modelling Results

6.1 Scenario 1

Scenario 1 represents a 'Do Nothing' option whereby existing 2011 AM/PM peak-hour flows are growthed to 2021 traffic flows (using the RTA factors presented in Section 5.4). Development traffic associated with the future growth of the Pymble Business Park is assigned to the study intersections, and no improvement options included (i.e. the road geometry of the study intersections remains as existing).

For Scenario 1, the following software packages were used:

- LinSig for Pacific Highway/ Ryde Road/ Mona Vale Road and Pacific Highway/ Bridge Street
- SIDRA INTERSECTION for Ryde Road/ West Street.

The results of the analysis are summarised by intersection in the following Sections, with the LinSig and SIDRA INTERSECTION modelling outputs presented in Appendix A and Appendix B respectively.

6.1.1 Pacific Highway/Ryde Road/Mona Vale Road

Table 6.1 presents a summary of the future operation of the Pacific Highway/ Ryde Road/ Mona Vale Road signalised intersection during the identified network peak-hours.

Modelling Results

Table 6.1: Scenario 1 – Pacific Highway/Ryde Road/Mona Vale Road (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (left and through)	902	113.3%	>200	F	779
	Pacific Hwy SB (through) Lane 3,4	1,738	113.0%	>200	F	562
	Pacific Hwy SB (right) Lane 5,6	566	100.1%	166.6	F	117
	Ryde Rd EB (left, right and through)	562	109.3%	>200	F	262
	Ryde Rd EB (right)	247	107.2%	>200	F	140
	Ryde Rd EB (right and U-Turn)	591	109.8%	>200	F	251
	Pacific Hwy NB (right)	304	112.6%	>200	F	203
	Pacific Hwy NB (through) Lane 3,4	1,024	66.8%	38.9	C	102
	Pacific Hwy NB (left and through)	682	72.6%	31.5	C	103
	Mona Vale Rd WB (right and U-Turn)	265	114.4%	>200	F	189
PM	Mona Vale Rd WB (right, left and through)	432	114.8%	>200	F	273
	Pacific Hwy SB (left and through)	590	75.6%	38.4	C	116
	Pacific Hwy SB (through) Lane 3,4	1,028	71.9%	42.6	D	111
	Pacific Hwy SB (right) Lane 5,6	664	66.8%	55.2	E	75
	Ryde Rd EB (left, right and through)	641	89.9%	50.6	D	123
	Ryde Rd EB (right)	78	53.6%	87.6	F	21
	Ryde Rd EB (right and U-Turn)	455	94.6%	76.0	F	69
	Pacific Hwy NB (right)	434	88.8%	78.2	F	118
	Pacific Hwy NB (through) Lane 3,4	1,247	85.1%	53.3	D	148
	Pacific Hwy NB (left and through)	896	90.0%	42.3	C	150
	Mona Vale Rd WB (right and U-Turn)	225	87.4%	82.0	F	39
	Mona Vale Rd WB (right, left and through)	247	88.6%	74.3	F	40

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 6.1 indicates that:

- During the Weekday AM peak hour, with the inclusion of background growth on the Pacific Highway and Ryde Road plus development traffic generated by the future expansion of the Pymble Business Park, all approaches to the intersection with the exception of Pacific Highway northbound through and left movements, experience significant delays and queuing.
- During the Weekday AM peak hour, these legs would exceed operational capacity under the current intersection layout.
- During the Weekday PM peak hour, the majority of approaches to the intersection experience delay and queuing, in particular Ryde Road and Mona Vale Road approaches.

6.1.2 Pacific Highway/Bridge Street

Table 6.2 presents a summary of the future operation of the Pacific Highway/Bridge Street signalised intersection during the identified network peak-hours.

Modelling Results

Table 6.2: Scenario 1 – Pacific Highway/Bridge Street (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DoS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (through) Lane 1,2	1,774	50.1%	2.0	A	3
	Pacific Hwy SB (right and through)	1,700	94.4%	24.2	B	103
	Bridge St (left)	180	33.1%	51.9	D	20
	Pacific Highway NB (through) Lane 2,3	1,627	59.9%	5.2	A	29
	Pacific Highway NB (left and through)	649	51.6%	4.3	A	51
PM	Pacific Hwy SB (through) Lane 1,2	1,117	32.8%	1.5	A	1
	Pacific Hwy SB (right and through)	1,226	68.1%	5.7	A	19
	Bridge St (left)	293	60.2%	62.8	E	38
	Pacific Highway NB (through) Lane 2,3	1,767	63.2%	5.5	A	40
	Pacific Highway NB (left and through)	733	56.6%	4.7	A	78

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 6.2 indicates that:

- During the Weekday AM peak hour the Bridge Street leg of the intersection experiences moderate delays for the left turn only movement onto the Pacific Highway.
- The Pacific Highway experiences queuing during the AM (southbound) and PM (northbound) peak hours.
- During the Weekday PM peak hour the Bridge Street leg of the intersection experiences significant delays and queuing for the left turn only movement onto the Pacific Highway.

6.1.3 Ryde Road/West Street

Table 6.3 presents a summary of the future operation of the Ryde Road/West Street priority intersection during the identified network peak-hours.

Table 6.3: Scenario 1 – Ryde Road/West Street

Intersection	Peak	Leg	Degree of Saturation (DoS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LoS)
Ryde Road/West Street	AM	Ryde Road (W)	0.586	8.8	-	A
		West Street	1.247	301.7	197.7	F
	PM	Ryde Road (W)	0.569	8.8	-	A
		West Street	1.865	> 360.0	> 500.0	F

Table 6.3 indicates that during both the Weekday AM and Weekday PM peak hour, the Ryde Road/West Street priority intersection experiences unacceptable delays and vehicle queuing exceeding the optimal capacity of the intersection.

6.2 Scenario 2

Scenario 2 is similar to Scenario 1 but with the inclusion of proposed intersection Improvements at the Pacific Highway/Bridge Street intersection (see Section 3.2) and the Ryde Road/West Street (see Section 3.3).

Modelling Results

As the Ryde Road/West Street intersection is signalised in Scenario 3, the LinSig software packages was used for all study intersections.

The results of the analysis are summarised by intersection in the following Sections, with the LinSig and modelling outputs presented in Appendix A.

6.2.1 Pacific Highway/Ryde Road/Mona Vale Road

Table 6.4 presents a summary of the future operation of the Pacific Highway/Ryde Road/Mona Vale Road signalised intersection during the identified network peak-hours.

Table 6.4: Scenario 2 – Pacific Highway/Ryde Road/Mona Vale Road (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (left and through)	907	113.9%	>200	F	798
	Pacific Hwy SB (through) Lane 3,4	1,733	113.7%	>200	F	579
	Pacific Hwy SB (right) Lane 5,6	566	96.7%	134.7	F	101
	Ryde Rd EB (left, right and through)	561	108.8%	>200	F	258
	Ryde Rd EB (right)	248	107.6%	>200	F	142
	Ryde Rd EB (right and U-Turn)	589	109.4%	>200	F	244
	Pacific Hwy NB (right)	304	112.6%	>200	F	203
	Pacific Hwy NB (through) Lane 3,4	1,026	67.1%	38.9	C	103
	Pacific Hwy NB (left and through)	680	72.3%	31.4	C	103
	Mona Vale Rd WB (right and U-Turn)	264	114.0%	>200	F	185
PM	Mona Vale Rd WB (right, left and through)	432	114.8%	>200	F	273
	Pacific Hwy SB (left and through)	613	84.0%	45.8	D	135
	Pacific Hwy SB (through) Lane 3,4	1,047	81.4%	47.8	D	129
	Pacific Hwy SB (right) Lane 5,6	688	72.7%	56.5	E	81
	Ryde Rd EB (left, right and through)	606	91.3%	50.9	D	142
	Ryde Rd EB (right)	147	75.8%	81.7	F	42
	Ryde Rd EB (right and U-Turn)	547	93.8%	61.9	E	76
	Pacific Hwy NB (right)	445	96.1%	107.9	F	144
	Pacific Hwy NB (through) Lane 3,4	1,297	95.2%	80.8	F	189
	Pacific Hwy NB (left and through)	934	97.3%	67.4	E	207
	Mona Vale Rd WB (right and U-Turn)	250	97.5%	133.6	F	73
	Mona Vale Rd WB (right, left and through)	279	98.2%	123.4	F	77

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 6.4 indicates that:

- During the Weekday AM peak hour, with the addition of background and development traffic combined with the proposed intersection improvement works, all approaches to the intersection with the exception of Pacific Highway northbound through and left movements, experience significant delays and vehicle queuing.
- During the Weekday AM peak hour, these legs would exceed operational capacity under the current intersection layout.

Modelling Results

- During the Weekday PM peak hour, the majority of approaches to the intersection experience delay and queuing, in particular Ryde Road and Mona Vale Road approaches.

6.2.2 Pacific Highway/Bridge Street

Table 6.5 presents a summary of the future operation of the Pacific Highway/Bridge Street signalised intersection during the identified network peak-hours.

Table 6.5: Scenario 2 – Pacific Highway/Bridge Street (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB(through) Lane 1,2	1,784	58.3%	5.3	A	62
	Pacific Hwy SB (right and through)	1,690	103.5%	108.7	F	671
	Bridge St (left)	180	29.3%	45.4	D	19
	Pacific Highway NB (through) Lane 2,3	1,510	61.7%	6.1	A	30
	Pacific Highway NB (left and through)	765	59.5%	6.0	A	85
PM	Pacific Hwy SB(through) Lane 1,2	1,168	39.4%	3.8	A	31
	Pacific Hwy SB (right and through)	1,331	82.7%	16.4	B	128
	Bridge St (left)	383	68.0%	58.9	E	48
	Pacific Highway NB (through) Lane 2,3	1,796	69.3%	7.1	A	34
	Pacific Highway NB (left and through)	825	66.0%	7.4	A	122

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 6.5 indicates that:

- During the Weekday AM peak hour the Bridge Street leg of the intersection experiences significant delays for the left turn only movement onto the Pacific Highway.
- The Pacific Highway experiences queuing for the southbound movement during the AM peak hour and exceeds operational capacity under the Scenario 3 intersection layout.
- During the Weekday PM peak hour the Bridge Street leg of the intersection experiences significant delays and queuing for the left turn only movement onto the Pacific Highway.

6.2.3 Ryde Road/West Street

Table 6.6 presents a summary of the future operation of the Ryde Road/West Street priority intersection during the identified network peak-hours.

Table 6.6: Scenario 2 – Ryde Road/West Street (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Ryde Rd EB (left and through) Lane	1,019	72.3%	10.5	A	115
	Ryde Rd EB (through) Lane 2,3	2,311	74.0%	9.3	A	124
	West St (left) Lane 1,2	184	69.7%	88.6	F	32
PM	Ryde Rd EB (left and through) Lane	968	82.5%	25.0	B	178
	Ryde Rd EB (through) Lane 2,3	2,229	85.2%	24.6	B	210
	West St (left) Lane 1,2	525	92.1%	75.6	F	110

Table 6.6 indicates that:

- During the Weekday AM and PM peak hour the West Street leg of the intersection experiences significant delays and moderate queuing for the left turn only movement onto Ryde Road.
- During the Weekday PM peak hour the Ryde Road leg of the intersection experiences reasonable delays and queuing for the eastbound approach to the intersection.

6.3 Scenario 3

Scenario 3 is similar to Scenario 2 but with the addition of a right-turn phase from Bridge Street onto Pacific Highway (S).

The results of the analysis are summarised by intersection in the following Sections, with the LinSig and modelling outputs presented in Appendix A.

6.3.1 Pacific Highway/Ryde Road/Mona Vale Road

Table 6.7 presents a summary of the future operation of the Pacific Highway/ Ryde Road/ Mona Vale Road signalised intersection during the identified network peak-hours.

Modelling Results

Table 6.7: Scenario 3 – Pacific Highway/Ryde Road/Mona Vale Road (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (left and through)	918	112.8%	>200	F	783
	Pacific Hwy SB (through) Lane 3,4	1,777	112.6%	>200	F	559
	Pacific Hwy SB (right) Lane 5,6	594	102.3%	186.0	F	131
	Ryde Rd EB (left, right and through)	560	109.2%	>200	F	258
	Ryde Rd EB (right)	233	106.7%	>200	F	131
	Ryde Rd EB (right and U-Turn)	540	109.5%	>200	F	230
	Pacific Hwy NB (right)	304	112.6%	>200	F	203
	Pacific Hwy NB (through) Lane 3,4	1,016	66.4%	37.6	C	102
	Pacific Hwy NB (left and through)	687	72.4%	31.0	C	104
	Mona Vale Rd WB (right and U-Turn)	263	113.5%	>200	F	181
	Mona Vale Rd WB (right, left and through)	433	115.4%	>200	F	189
PM	Pacific Hwy SB (left and through)	669	98.7%	87.6	F	207
	Pacific Hwy SB (through) Lane 3,4	1,157	97.6%	82.7	F	190
	Pacific Hwy SB (right) Lane 5,6	769	74.4%	60.1	E	96
	Ryde Rd EB (left, right and through)	576	90.1%	43.7	D	140
	Ryde Rd EB (right)	111	57.2%	74.1	F	28
	Ryde Rd EB (right and U-Turn)	427	84.5%	51.6	D	52
	Pacific Hwy NB (right)	445	88.7%	76.8	F	121
	Pacific Hwy NB (through) Lane 3,4	1,277	105.7%	197.1	F	310
	Pacific Hwy NB (left and through)	937	106.8%	178.7	F	388
	Mona Vale Rd WB (right and U-Turn)	250	84.9%	76.0	F	48
	Mona Vale Rd WB (right, left and through)	277	85.9%	65.2	E	48

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 6.7 indicates that:

- During the Weekday AM peak hour, with the addition of background and development traffic combined with the proposed intersection improvement works, all approaches to the intersection with the exception of Pacific Highway northbound through and left movements, experience significant delays and queuing.
- The Pacific Highway southbound movement during the AM peak hour experiences extensive queues and delay on approach to the intersection.
- During the Weekday AM peak hour, these legs would significantly exceed operational capacity under the current intersection layout.
- During the Weekday PM peak hour, the majority of approaches to the intersection experience delay and queuing, in particular Ryde Road and Mona Vale Road approaches.

6.3.2 Pacific Highway/Bridge Street

Table 6.8 presents a summary of the future operation of the Pacific Highway/Bridge Street signalised intersection during the identified network peak-hours.

Modelling Results

Table 6.8: Scenario 3 – Pacific Highway/Bridge Street (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (through) Lane 1,2	1,798	58.9%	5.3	A	63
	Pacific Hwy SB (right and through)	1,669	102.1%	40.4	C	610
	Bridge St (left and right)	270	119.2%	>200	F	185
	Pacific Highway NB (through) Lane 2,3	1,496	64.9%	8.9	A	121
	Pacific Highway NB (left and through)	780	65.1%	7.8	A	90
PM	Pacific Hwy SB (through) Lane 1,2	1,230	50.4%	10.9	A	70
	Pacific Hwy SB (right and through)	1,194	89.4%	28.3	B	230
	Bridge St (left)	642	110.6%	>200	F	348
	Pacific Highway NB (through) Lane 2,3	1,775	109.4%	>200	F	466
	Pacific Highway NB (left and through)	848	109.3%	>200	F	442

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 6.8 indicates that:

- During the Weekday AM and PM peak hour the Bridge Street leg of the intersection experiences significant delays and queuing for the left and right turns onto the Pacific Highway.
- The Pacific Highway experiences significant queuing during the AM peak hour (southbound) and PM peak hour (northbound) and exceeds operational capacity under the Scenario 4 intersection layout.

6.3.3 Ryde Road/West Street

Table 6.9 presents a summary of the future operation of the Ryde Road/West Street priority intersection during the identified network peak-hours.

Table 6.9: Scenario 3 – Ryde Road/West Street (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Ryde Rd EB (left and through) Lane	1,027	69.8%	7.9	A	94
	Ryde Rd EB (through) Lane 2,3	2,299	70.6%	6.7	A	96
	West St (left) Lane 1,2	92	58.7%	99.0	F	18
PM	Ryde Rd EB (left and through) Lane	956	71.6%	12.9	A	121
	Ryde Rd EB (through) Lane 2,3	2,218	74.8%	12.2	A	140
	West St (left) Lane 1,2	260	81.4%	80.9	E	55

Table 6.9 indicates that:

- During the Weekday AM and PM peak hour the West Street leg of the intersection experiences significant delays for the left turn only movement onto Ryde Road.
- During the Weekday PM peak hour the Ryde Road leg of the intersection experiences reasonable delays and queuing for the eastbound approach to the intersection.

6.4 Scenario 4

Scenario 4 is similar to Scenario 2 but with the inclusion of proposed intersection improvements at the Pacific Highway/ Ryde Road/ Mona Vale Road intersection (see Section 3.1).

The results of the analysis are summarised by intersection in the following Sections, with the LinSig and modelling outputs presented in Appendix A.

6.4.1 Pacific Highway/Ryde Road/Mona Vale Road

Table 6.10 presents a summary of the future operation of the Pacific Highway/Ryde Road/Mona Vale Road signalised intersection during the identified network peak-hours.

Table 6.10: Scenario 4 – Pacific Highway/Ryde Road/Mona Vale Road (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (left and through)	903	111.6%	>200	F	744
	Pacific Hwy SB (through) Lane 3,4	1,737	111.3%	>200	F	525
	Pacific Hwy SB (right) Lane 5,6	566	95.7%	130.5	F	100
	Ryde Rd EB (left, right and through)	641	103.8%	162.8	F	191
	Ryde Rd EB (right)	207	106.7%	>200	F	118
	Ryde Rd EB (right and U-Turn)	551	109.8%	>200	F	229
	Pacific Hwy NB (right)	304	107.5%	>200	F	169
	Pacific Hwy NB (through) Lane 3,4	1,027	66.0%	37.8	C	101
	Pacific Hwy NB (left and through)	679	71.2%	30.5	C	101
	Mona Vale Rd WB (right and U-Turn)	265	108.6%	>200	F	154
	Mona Vale Rd WB (right, left and through)	431	110.5%	>200	F	228
PM	Pacific Hwy SB (left and through)	602	83.8%	47.6	D	132
	Pacific Hwy SB (through) Lane 3,4	1,058	81.1%	51.2	D	126
	Pacific Hwy SB (right) Lane 5,6	688	72.7%	59.4	E	81
	Ryde Rd EB (left, right and through)	598	90.7%	48.4	D	145
	Ryde Rd EB (right)	136	59.0%	60.4	E	33
	Ryde Rd EB (right and U-Turn)	565	86.8%	42.5	C	63
	Pacific Hwy NB (right)	445	96.1%	107.9	F	144
	Pacific Hwy NB (through) Lane 3,4	1,297	97.1%	91.4	F	201
	Pacific Hwy NB (left and through)	935	98.8%	77.9	F	228
	Mona Vale Rd WB (right and U-Turn)	250	108.2%	>200	F	130
	Mona Vale Rd WB (right, left and through)	279	107.9%	>200	F	130

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 6.10 indicates that:

- During the Weekday AM peak hour, with the addition of background and development traffic combined with the proposed intersection improvement works for Scenario 5, all approaches to the intersection with the exception of Pacific Highway northbound through and left movements, experience significant delays and queuing.

Modelling Results

- The Pacific Highway southbound movement during the AM peak hour experiences extensive queues and delay on approach to the intersection.
- During the Weekday AM peak hour, these legs would exceed operational capacity under the Scenario 5 intersection layout.
- During the Weekday PM peak hour, the majority of approaches to the intersection experience delay and queuing.

6.4.2 Pacific Highway/Bridge Street

Table 6.11 presents a summary of the future operation of the Pacific Highway/Bridge Street signalised intersection during the identified network peak-hours.

Table 6.11: Scenario 4 – Pacific Highway/Bridge Street (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DOS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Pacific Hwy SB (through) Lane 1,2	1,776	53.6%	2.9	A	31
	Pacific Hwy SB (right and through)	1,698	96.4%	31.9	C	193
	Bridge St (left)	180	31.4%	49.1	D	19
	Pacific Highway NB (through) Lane 2,3	1,512	59.7%	4.5	A	42
	Pacific Highway NB (left and through)	763	58.0%	5.0	A	85
PM	Pacific Hwy SB (through) Lane 1,2	1,144	35.7%	2.1	A	15
	Pacific Hwy SB (right and through)	1,355	78.0%	11.5	A	65
	Bridge St (left)	383	69.2%	60.4	E	49
	Pacific Highway NB (through) Lane 2,3	1,804	68.0%	6.7	A	36
	Pacific Highway NB (left and through)	817	64.6%	7.2	A	119

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.

[2] Assume 6.0m per pcu.

Table 6.11 indicates that:

- During the Weekday AM and PM peak hour the Bridge Street leg of the intersection experiences delays and moderate queuing for the left turn only movement onto the Pacific Highway.
- The Pacific Highway experiences queuing during the AM peak hour (southbound) and PM peak hour (northbound) under the Scenario 5 intersection layout.

6.4.3 Ryde Road/West Street

Table 6.12 presents a summary of the future operation of the Ryde Road/West Street priority intersection during the identified network peak-hours.

Table 6.12: Scenario 4 – Ryde Road/West Street (Optimised Results)

Peak	Approach	Demand Flows (pcu)	DoS	Average Delay (sec/pcu)	LOS [1]	Average Maximum Queue (m) [2]
AM	Ryde Rd EB (left and through) Lane	1,043	73.4%	10.3	A	116
	Ryde Rd EB (through) Lane 2,3	2,287	72.7%	8.6	A	115
	West St (left) Lane 1,2	185	75.5%	96.6	F	34
PM	Ryde Rd EB (left and through) Lane	971	83.6%	26.4	B	183
	Ryde Rd EB (through) Lane 2,3	2,228	86.0%	25.9	B	215
	West St (left) Lane 1,2	522	88.8%	69.1	E	102

Table 6.12 indicates that:

- During the Weekday AM and PM peak hour the West Street leg of the intersection experiences delays and moderate queuing for the left turn only movement onto Ryde Road.
- During the Weekday PM peak hour the Ryde Road leg of the intersection experiences moderate delays and queuing for the eastbound approach to the intersection.

6.5 Total Intersection and Network Operation Results

Table 6.13 has been prepared to summarise the overall intersection operating performance for all modelled scenarios. The three parameters that LinSig provides for the intersections are:

- Practical Reserve Capacity (PRC) – available capacity within the intersection, with a negative result indicating that the intersection is over capacity
- Total delay per hour – combination of delay for all vehicles in hours
- Degree of Saturation (DoS) – percentage of actual flow and saturation flow.

Modelling Results

Table 6.13: Summary of Overall Intersection Operation

Intersection	Peak	Parameter	Existing	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Pacific Highway/Bridge Street	AM	PRC	10.7%	-4.9%	-15.0%	-32.4%	-7.1%
		Total delay	9.5	18.0	59.6	79.0	21.8
		DoS	81.3%	94.4%	103.5%	119.2%	96.4%
	PM	PRC	-0.5%	32.1%	-8.9%	-22.9%	15.4%
		Total delay	13.4	11.1	18.8	216.7	16.4
		DoS	90.5%	68.1%	82.7%	110.6%	78.0%
Pacific Highway/ Ryde Road/ Mona Vale Road	AM	PRC	-18.3%	-27.6%	-27.6%	-28.3%	-24.0%
		Total delay	199.4	437.2	411.5	412.3	377.9
		DoS	106.4%	114.8%	114.8%	115.4%	111.6%
	PM	PRC	-6.5%	-5.1%	-9.2%	-18.7%	-20.3%
		Total delay	98.4	97.9	132.7	207.0	154.2
		DoS	95.8%	94.6%	98.2%	106.8%	108.2%
Ryde Road/ West Street	AM	PRC	-	-	21.7%	27.5%	19.2%
		Total delay	-	-	15.8	11.2	15.7
		DoS	-	-	74.0%	70.6%	75.5%
	PM	PRC	-	-	-2.3%	10.6%	1.4%
		Total delay	-	-	37.2	19.7	37.1
		DoS	-	-	92.1%	81.4%	88.8%
Total Network	AM	PRC	-18.3%	-27.6%	-27.6%	-32.4%	-24.0%
		Total delay	208.9	455.2	486.9	502.5	415.4
		DoS	106.4%	114.8%	114.8%	119.2%	111.6%
	PM	PRC	-6.5%	-5.1%	-9.2%	-22.9%	-20.3%
		Total delay	112.0	109.0	188.6	443.4	207.7
		DoS	95.8%	94.6%	98.2%	110.6%	108.2%

6.6 Future Bus Stops

Included within the Project Brief was the requirement to identify suitable locations for future bus stops to improve accessibility to public transport services.

For eastbound services on Ryde Road, it is recommended that a bus stop could be located approximately 90 metres west of West Street, outside 25-31 Ryde Road. A bus stop at this location would avoid conflict with eastbound vehicles attempting to access either West Street or the Ryde Road off-ramp, be advantageous from a gradient perspective, and would ensure that the majority of businesses within the Park would be within a 400 metre walk of the bus stop.

For northbound services on the Pacific Highway, it is recommended that a bus stop could be located approximately 190 metres south of Ryde Road/Mona Vale Road, outside 880 Pacific Highway (Alto Mitsubishi). A bus stop at this location would avoid conflict with northbound vehicles attempting to access the Ryde Road on-ramp turn bay and would be advantageous from both a gradient and a vehicular sight distance perspective.

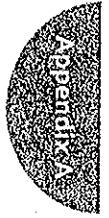
7. Conclusions

The key outcomes of the assessment undertaken by GTA Consultants are as follows:

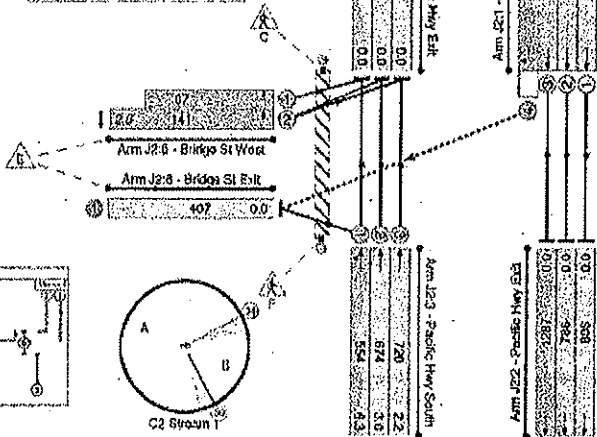
- i The total network under existing conditions is operating in excess or near to operational capacity during the Weekday AM and PM peak hours respectively.
- ii Scenario 1 with background growth and development traffic with no intersection works results in the modelled network exceeding capacity with significant delay and queuing.
- iii Scenario 2 with the inclusion of the Pacific Highway pedestrian crossing at Bridge Street and West Street signalisation at Ryde Road results in minor additional delay for the total network.
- iv Scenario 3 impact of the Bridge Street right turn onto the Pacific Highway has a negative impact on the total network operation, though presents benefits for West Street traffic at Ryde Road.
- v Scenario 4 provides additional Ryde Road left turn capacity on approach to the Pacific Highway with total network operation results similar to those presented in Scenario 2.
- vi Of the three improvement options prepared by Council, the signalisation of the Ryde Road/West Street would be an essential requirement to mitigate the traffic impact associated with any future growth in the Pymble Business Park.

Appendix A

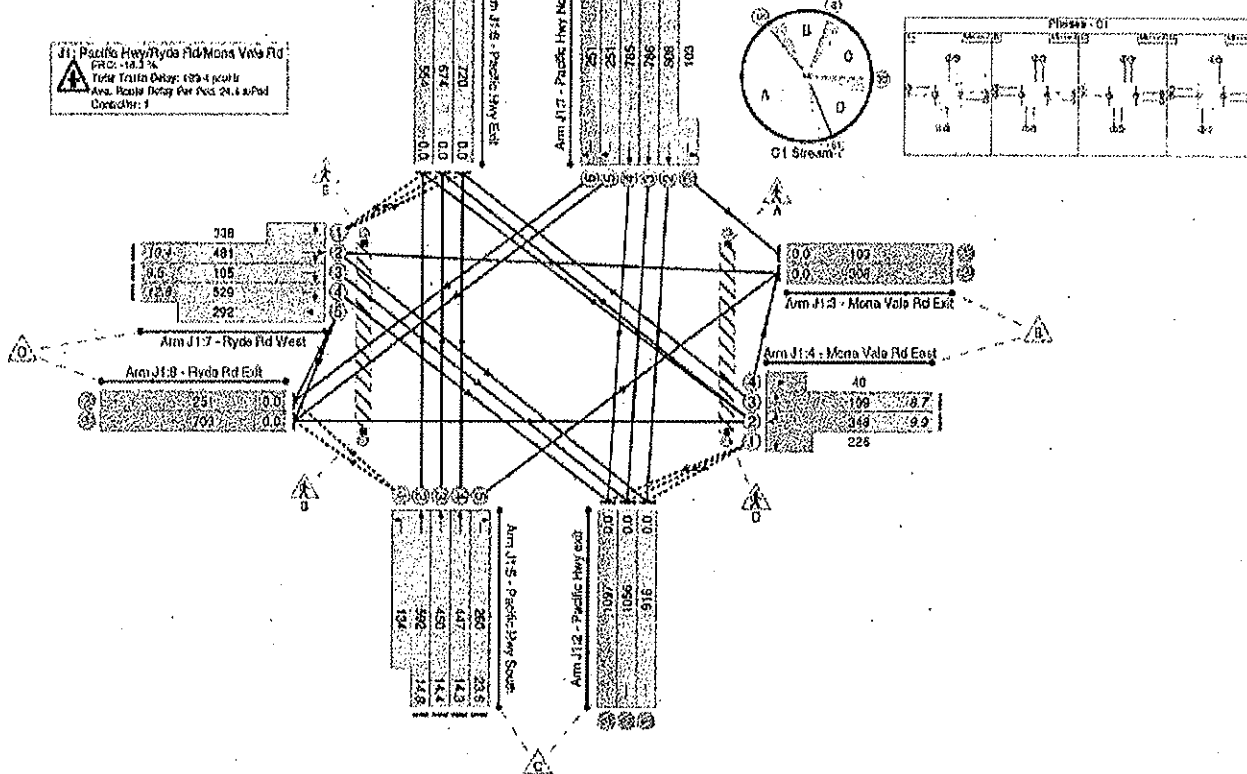
LinSig Modelling Results



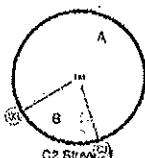
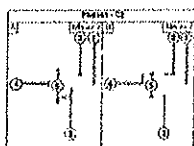
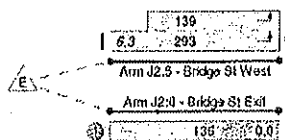
J2: Pacific Hwy/Bridge St
PRC: 10.1 %
Total Traffic Delay: 9.8 pcu/s
Avg. Queue Delay Per Pcd: 8.2 s/Pcd
Controlled: 2



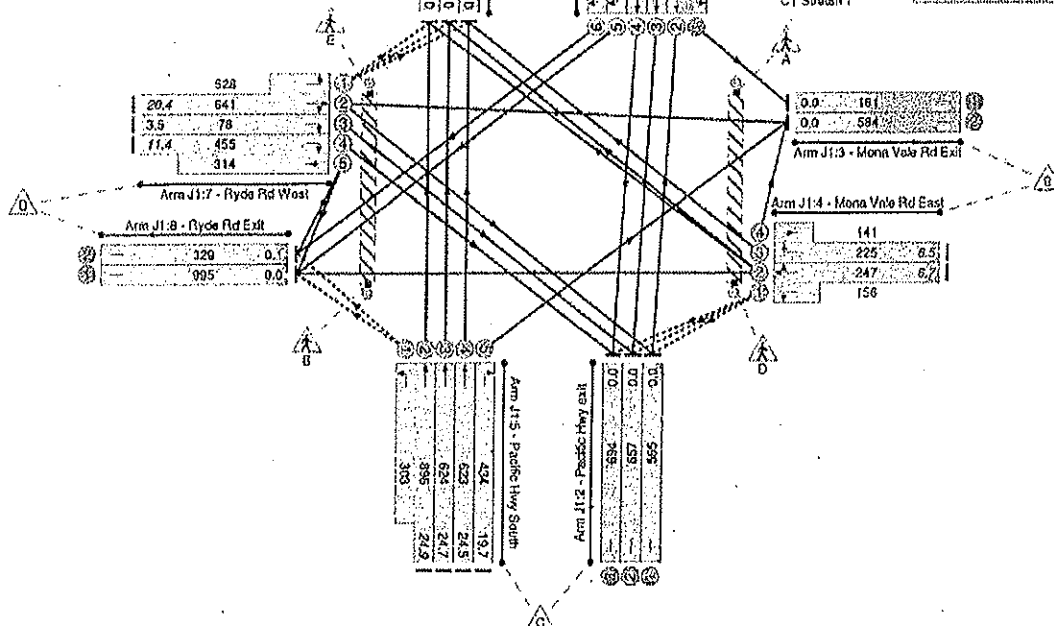
J1: Pacific Hwy/Mona Vale Rd
PRC: 16.3 %
Total Traffic Delay: 189.4 pcu/s
Avg. Queue Delay Per Pcd: 24.6 s/Pcd
Controlled: 1

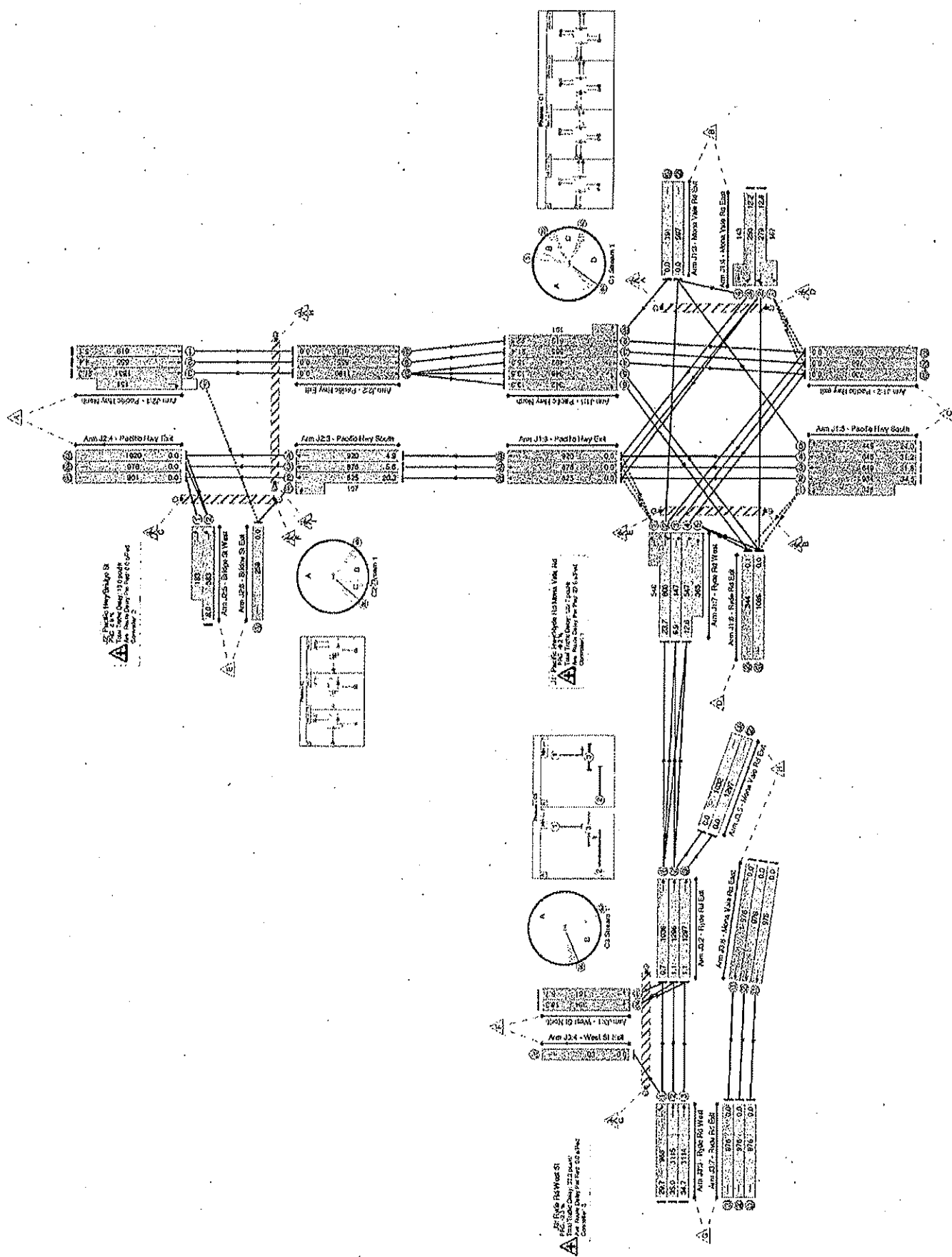


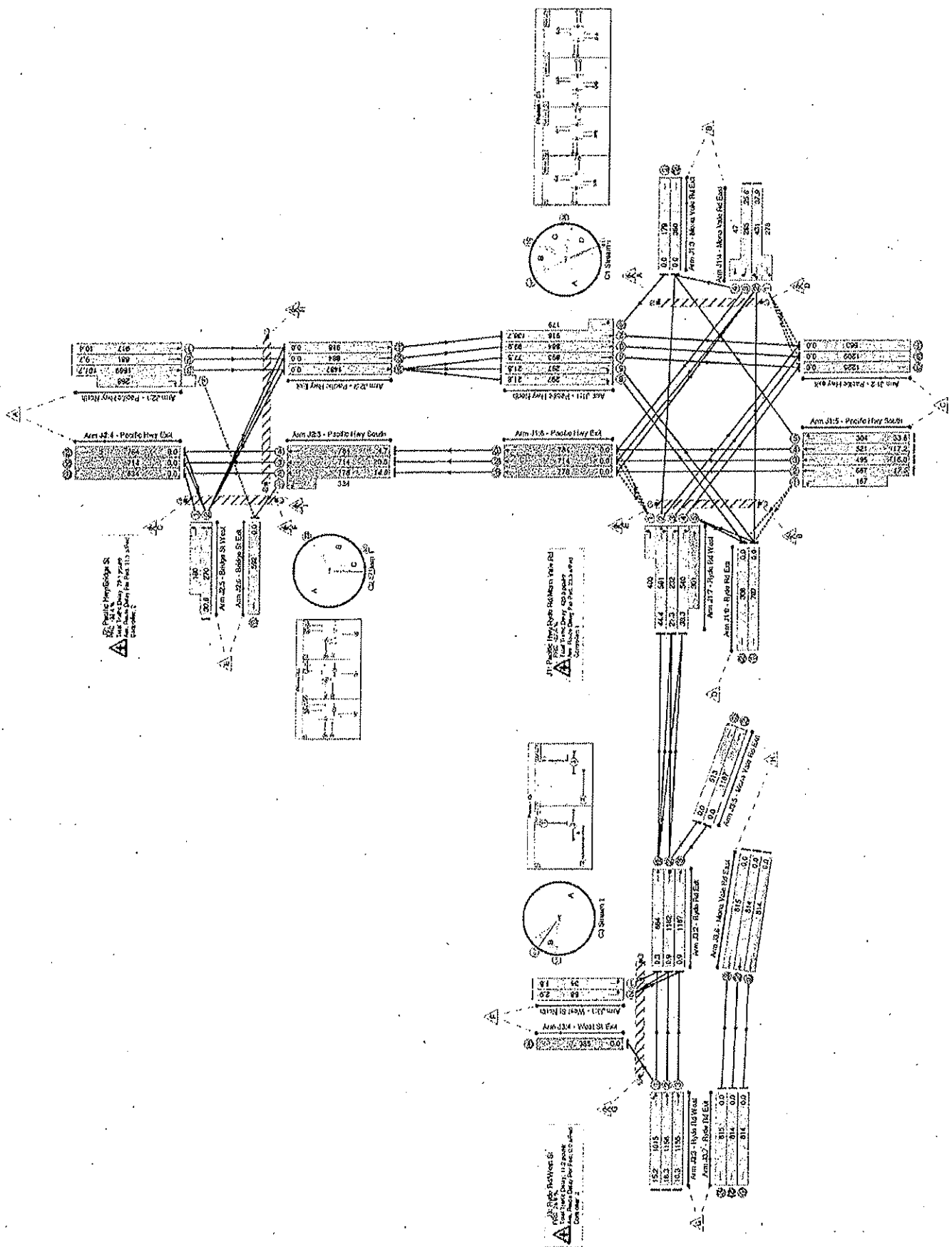
J2: Pacific Hwy/Bridge St
 PLO: 32.1 %
 Ave. Route Delay Per Ped: 0.0 s/Ped
 Control: 2

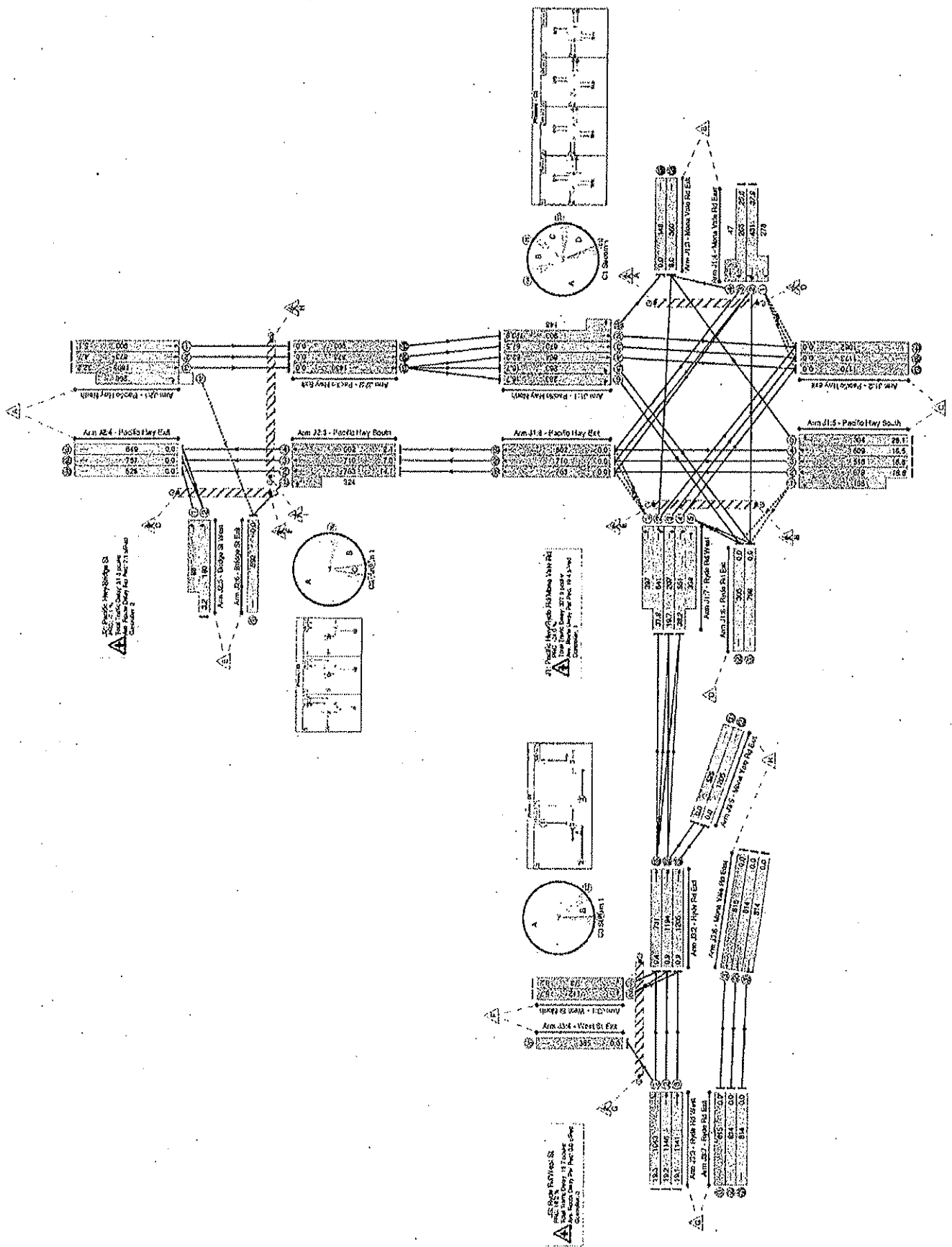


J1: Pacific Hwy/Ryde Rd/Mona Vale Rd
 PLO: 5.1 %
 Ave. Route Delay Per Ped: 21.0 s/Ped
 Control: 1









Network Results View

Filter: ☒ All ☐ Stream ☐ Lane ☐ Route

☐ Show Exit Lanes ☐ Show Route Layers

PCUs and Capacity Values

☒ Display Per Period ☐ Display Per Cycle

Tree

Columns

Customise...

Column Set 1: Use

Column Set 2: Use

View Type

☒ Tree View ☐ Flat View

Item	Item	Line	Cl	Rte	Pos	Fd	SG	Ar	Flw	Sat Flow	Cap	Deg	TDly	Dly	MMQ
	Desc	Typ	Stm			SG		SG	pcu	pcu/Hr	pcu	Sal	pcu/Hr	\$/pcu	pcu
Network															
1/2+1/1	Pacific Hwy North Ahead Left	U	N/A	N/A		C1:1			808	1800:1800	766	106.4%	208.9		
1/3	Pacific Hwy North Ahead	U	N/A	N/A		C1:1			786	1800	746	105.5%	39.2	174.6	63.6
1/4	Pacific Hwy North Ahead	U	N/A	N/A		C1:1			785	1800	746	105.4%	38.3	175.5	59.5
1/5	Pacific Hwy North Right	U	N/A	N/A		C1:2			251	1800	257	97.6%	10.7	173.6	59.0
1/6	Pacific Hwy North Right	U	N/A	N/A		C1:2			251	1800	257	97.6%	10.7	153.5	16.2
4/2+4/1	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A		C1:5			348	1744:1800	393	88.5%	6.4	66.5	9.9
4/3+4/4	Mona Vale Rd East U-Turn Right	U	N/A	N/A		C1:5 C1:6			199	1744:1800	247	80.6%	4.8	87.2	8.7
5/2+5/1	Pacific Hwy South Ahead Left	U+O	N/A	N/A		C1:3			592	1800:1800	896	66.1%	5.1	31.2	14.8
5/3	Pacific Hwy South Ahead	U	N/A	N/A		C1:3			450	1800	746	60.3%	4.8	38.1	14.4
5/4	Pacific Hwy South Ahead	U	N/A	N/A		C1:3			447	1800	746	59.9%	4.7	37.9	14.3
5/5	Pacific Hwy South Right	U	N/A	N/A		C1:4			260	1800	244	106.4%	18.3	252.7	23.6
7/2+7/1	Ryde Rd West Right Ahead Left	U+O	N/A	N/A		C1:7			481	1558:1800	546	88.1%	6.1	45.8	10.4
7/3	Ryde Rd West Right	U	N/A	N/A		C1:7			195	1698	267	73.1%	4.4	80.4	6.5
7/4+7/5	Ryde Rd West Right U-Turn	U	N/A	N/A		C1:7 C1:8			529	1698:1800	596	88.9%	8.0	54.5	12.6
8/2	Ryde Rd Exit	U	N/A	N/A					251	3600	3600	7.0%	0.0	0.5	0.0
Ped Link: P1	Mona Vale Rd North	-	N/A	-		C1:9			8	-	29829	0.0%	0.1	24.4	0.2
Ped Link: P2	Ryde Rd South	-	N/A	-		C1:9			14	-	29829	0.1%	0.1	24.4	0.3
Ped Link: P3	Pacific Hwy North Ahead	U	N/A	N/A		C2:1			808	1800	1800	44.9%	0.4	1.8	0.4
Ped Link: P4	Pacific Hwy North Ahead	U	N/A	N/A		C2:1			786	1800	1800	43.7%	0.4	1.8	0.4
Ped Link: P5	Pacific Hwy North Ahead Right	U+O	N/A	N/A		C2:1 C2:2			1463	1800:1800	1800	81.3%	4.6	11.3	8.2
Ped Link: P6	Pacific Hwy South Ahead Left	U	N/A	N/A		C2:3			554	1776	1231	45.0%	0.5	3.2	6.3
Ped Link: P7	Pacific Hwy South Ahead	U	N/A	N/A		C2:3			674	1916	1355	49.7%	0.8	4.4	3.0
Ped Link: P8	Pacific Hwy South Ahead	U	N/A	N/A		C2:3			720	1916	1355	53.1%	0.8	4.1	2.2
Ped Link: P9	Bridge St West Left	U	N/A	N/A		C2:4			141	1492:1352	541	26.1%	2.0	50.8	2.6
Ped Link: P10	Bridge St	-	N/A	-		C2:5			12	-	50914	0.0%	0.0	6.2	0.1

C1	PRC for Signalled Lanes (%):	-18.3	Total Delay for Signalled Lanes (pcuHr):	199.34
C2	PRC for Signalled Lanes (%):	10.7	Total Delay for Signalled Lanes (pcuHr):	9.52
	PRC Over All Lanes (%):	-18.3	Total Delay Over All Lanes (pcuHr):	208.89
			Cycle Time (s):	140

Network Results View

☒ All ☐ Stream ☐ Lane ☐ Route

☐ Show Exit Lanes ☐ Show Route Layers

☒ Display Per Period ☐ Display Per Cycle

☒ Tree View ☐ Flat View

Item	Item Desc	Line Type	CL	Rte Pos	Fd SG	Ar SG	Flow	Sat Flow	Cap	Deg Sat	TDly	Dly	MND
Network													
31: Pacific Hwy/Ryde Rd/Mona Vale Rd													
1/2+1/1	Pacific Hwy North Ahead Left	U	N/A	N/A	C1:1		571	1800:1800	730	95.8%	98.4	42.4	19.4
1/3	Pacific Hwy North Ahead	U	N/A	N/A	C1:1		508	1800	681	74.5%	6.8	47.9	18.5
1/4	Pacific Hwy North Ahead	U	N/A	N/A	C1:1		488	1800	681	71.6%	6.3	46.3	17.4
1/5	Pacific Hwy North Right	U	N/A	N/A	C1:2		327	1800	450	72.7%	5.7	62.5	12.9
1/6	Pacific Hwy North Right	U	N/A	N/A	C1:2		323	1800	450	71.8%	5.6	61.9	12.6
4/2+4/1	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A	C1:5		252	1744:1800	304	82.9%	4.2	59.6	6.2
4/3+4/4	Mona Vale Rd East U-Turn Right	U	N/A	N/A	C1:5 C1:6		223	1744:1800	278	80.3%	4.1	66.9	6.0
5/2+5/1	Pacific Hwy South Ahead Left	U+O	N/A	N/A	C1:3		888	1800:1800	955	93.0%	12.5	50.5	27.2
5/3	Pacific Hwy South Ahead	U	N/A	N/A	C1:3		606	1800	681	88.9%	10.5	62.5	25.7
5/4	Pacific Hwy South Ahead	U	N/A	N/A	C1:3		607	1800	681	89.1%	10.6	62.8	25.8
5/5	Pacific Hwy South Right	U	N/A	N/A	C1:4		419	1800	437	95.8%	12.7	109.5	22.7
7/2+7/1	Ryde Rd West Right Ahead Left	U+O	N/A	N/A	C1:7		596	1558:1800	730	81.6%	6.2	37.3	17.3
7/3	Ryde Rd West Right	U	N/A	N/A	C1:7		75	1698	206	36.4%	1.5	70.2	3.0
7/4+7/5	Ryde Rd West Right U-Turn	U	N/A	N/A	C1:7 C1:8		453	1698:1800	595	76.1%	5.1	40.6	7.4
8/2	Ryde Rd Exit	U	N/A	N/A			323	3600	3600	9.0%	0.0	0.5	0.0
32: Pacific Hwy/Bridge St													
1/1	Mona Vale Rd North	-	N/A	-	C1:9		3	-	27257	0.0%	0.0	27.5	0.1
1/2	Ryde Rd South	-	N/A	-	C1:9		11	-	27257	0.0%	0.1	27.5	0.3
1/3+1/4	Pacific Hwy North Ahead	U	N/A	N/A	C2:1		571	1800	1800	31.7%	0.2	1.5	0.2
3/1	Pacific Hwy North Ahead	U	N/A	N/A	C2:1		508	1800	1800	28.2%	0.2	1.4	0.2
3/2	Pacific Hwy North Ahead Right	U+O	N/A	N/A	C2:1 C2:2		1199	1800:1800	1800	66.6%	2.0	6.0	3.2
3/3	Pacific Hwy South Ahead Left	U	N/A	N/A	C2:3		710	1776	1395	50.9%	0.6	3.2	12.9
5/2+5/1	Pacific Hwy South Ahead	U	N/A	N/A	C2:3		857	1916	1533	55.9%	0.9	3.7	3.0
Ped Link P1	Pacific Hwy South Ahead	U	N/A	N/A	C2:3		883	1916	1533	57.6%	0.9	3.6	2.5
Ped Link P2	Bridge St West Left	U	N/A	N/A	C2:4		294	1492:1352	325	90.5%	8.8	107.8	9.7
	Bridge St	-	N/A	-	C2:5		0	-	57600	0.0%	0.0	0.0	0.0

C1	PRC for Signalised Lanes (%):	-6.5	Total Delay for Signalised Lanes (pcuHr):	98.34
C2	PRC for Signalised Lanes (%):	-0.5	Total Delay for Signalised Lanes (pcuHr):	13.63
	PRC Over All Lanes (%):	-6.5	Total Delay Over All Lanes (pcuHr):	112.01
			Cycle Time (s):	140

Network Results View

☒ All ☐ Stream ☐ Lane ☐ Route

☐ Show Exit Lanes ☐ Show Route Layers

Item	Item	Line	Type	Dir	Sim	Pos	Flt	SG	Flw	Sat Flow	Cap	Dag	TDly	Dly	MMQ
Network															
1/2+1/1	Pacific Hwy North Ahead Left	U	N/A	N/A	N/A	N/A	N/A	C1:1	902	1800:1800	796	113.3%	72.5	289.5	129.8
1/3	Pacific Hwy North Ahead	U	N/A	N/A	N/A	N/A	N/A	C1:1	872	1800	771	113.0%	70.5	291.1	93.6
1/4	Pacific Hwy North Ahead	U	N/A	N/A	N/A	N/A	N/A	C1:1	866	1800	771	112.3%	67.1	279.0	90.1
1/5	Pacific Hwy North Right	U	N/A	N/A	N/A	N/A	N/A	C1:2	283	1800	283	100.1%	13.1	166.6	19.5
1/6	Pacific Hwy North Right	U	N/A	N/A	N/A	N/A	N/A	C1:2	283	1800	283	100.1%	13.1	166.6	19.5
4/2+4/1	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A	N/A	N/A	N/A	C1:5	432	1744:1800	376	114.8%	38.3	319.2	45.4
4/3+4/4	Mona Vale Rd East U-Turn Right	U	N/A	N/A	N/A	N/A	N/A	C1:5 C1:6	265	1744:1800	232	114.4%	26.8	363.9	31.4
5/2+5/1	Pacific Hwy South Ahead Left	U+O	N/A	N/A	N/A	N/A	N/A	C1:3	682	1800:1800	940	72.6%	6.0	31.5	17.2
5/3	Pacific Hwy South Ahead	U	N/A	N/A	N/A	N/A	N/A	C1:3	515	1800	771	66.6%	5.6	39.0	17.0
5/4	Pacific Hwy South Ahead	U	N/A	N/A	N/A	N/A	N/A	C1:3	509	1800	771	66.0%	5.5	38.7	16.7
5/5	Pacific Hwy South Right	U	N/A	N/A	N/A	N/A	N/A	C1:4	304	1800	270	112.6%	27.8	329.7	33.8
7/2+7/1	Ryde Rd West Right Ahead Left	U+O	N/A	N/A	N/A	N/A	N/A	C1:7	562	1558:1800	514	109.3%	34.7	222.4	43.6
7/3	Ryde Rd West Right	U	N/A	N/A	N/A	N/A	N/A	C1:7	247	1698	230	107.2%	18.3	267.2	23.3
7/4+7/5	Ryde Rd West Right U-Turn	U	N/A	N/A	N/A	N/A	N/A	C1:7 C1:8	591	1698:1800	538	109.8%	37.7	229.7	41.8
8/2	Ryde Rd Exit	U	N/A	N/A	N/A	N/A	N/A	-	283	3600	3600	7.9%	0.0	0.5	0.0
8/3	Mona Vale Rd North	-	N/A	-	N/A	-	N/A	C1:9	8	-	33943	0.0%	0.0	19.9	0.2
8/4	Ryde Rd South	-	N/A	-	N/A	-	N/A	C1:9	14	-	33943	0.1%	0.1	19.9	0.3
1/1	Pacific Hwy North Ahead	U	N/A	N/A	N/A	N/A	N/A	C2:1	902	1800	1800	50.1%	0.5	2.0	0.5
1/2	Pacific Hwy North Ahead	U	N/A	N/A	N/A	N/A	N/A	C2:1	872	1800	1800	49.4%	0.5	1.9	0.5
1/3+1/4	Pacific Hwy North Ahead Right	U+O	N/A	N/A	N/A	N/A	N/A	C2:1 C2:2	1700	1800:1800	1800	94.4%	11.4	24.2	17.2
3/1	Pacific Hwy South Ahead Left	U	N/A	N/A	N/A	N/A	N/A	C2:3	649	1776	1231	51.6%	0.8	4.3	8.5
3/2	Pacific Hwy South Ahead	U	N/A	N/A	N/A	N/A	N/A	C2:3	777	1916	1355	55.5%	1.1	5.3	4.8
3/3	Pacific Hwy South Ahead	U	N/A	N/A	N/A	N/A	N/A	C2:3	850	1916	1355	59.9%	1.2	5.1	3.8
5/2+5/1	Bridge St West Left	U	N/A	N/A	N/A	N/A	N/A	C2:4	180	1492:1352	543	33.1%	2.6	51.9	3.3
5/3	Bridge St	-	N/A	-	N/A	-	N/A	C2:5	12	-	50914	0.0%	0.0	6.2	0.1

C1	PRC for Signalled Lanes (%):	-27.6	Total Delay for Signalled Lanes (puHr):	437.11
C2	PRC for Signalled Lanes (%):	-4.9	Total Delay for Signalled Lanes (puHr):	18.04
	PRC Over All Lanes (%):	-27.6	Total Delay Over All Lanes (puHr):	455.19
			Cycle Time (s):	140

Network Results View

Filter: ☐ All ☐ Stream ☐ Lane ☐ Route

☐ Show Exit Lanes ☐ Show Route Layers

PCUs and Capacity Values: ☒ Display Per Period ☐ Display Per Cycle

Tree: Collapse Expand

Columns: Customise...

Column Set 1: Use Save Column Set 2: Use Save

View Type: ☒ Tree View ☐ Flat View

Network	Item	Item Desc	Line	Cl	Rte	Ful	Air	Flw	Sat Flow	Cap	Deg	TDW	Dly	MMQ
			Typ	Sim	Pos	SG	SG	pcu	pcu/Hr	pcu	Sat	pcu/Hr	s/pcu	pcu
				N/A							94.8%	109.0		
				N/A							94.6%	97.9		
1/2+1/1		Pacific Hwy North Ahead Left	U	N/A	N/A	C1:1 -		590	1800:1800	780	75.6%	6.3	38.4	19.3
1/3		Pacific Hwy North Ahead	U	N/A	N/A	C1:1		527	1800	733	71.9%	6.4	43.4	18.4
1/4		Pacific Hwy North Ahead	U	N/A	N/A	C1:1		501	1800	733	68.4%	5.8	41.8	17.1
1/5		Pacific Hwy North Right	U	N/A	N/A	C1:2		335	1800	501	66.8%	5.2	55.5	12.5
1/6		Pacific Hwy North Right	U	N/A	N/A	C1:2		329	1800	501	65.6%	5.0	54.9	12.2
4/2+4/1		Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A	C1:5 -		247	1744:1800	279	88.6%	5.1	76.3	6.7
4/3+4/4		Mona Vale Rd East U-Turn Right	U	N/A	N/A	C1:5 C1:6		225	1744:1800	257	87.4%	5.1	82.0	6.5
5/2+5/1		Pacific Hwy South Ahead Left	U+O	N/A	N/A	C1:3 -		896	1800:1800	996	90.0%	10.5	42.3	24.9
5/3		Pacific Hwy South Ahead	U	N/A	N/A	C1:3		624	1800	733	85.1%	9.3	53.4	24.7
5/4		Pacific Hwy South Ahead	U	N/A	N/A	C1:3		623	1800	733	85.0%	9.2	53.2	24.5
5/5		Pacific Hwy South Right	U	N/A	N/A	C1:4		434	1800	489	88.6%	9.4	78.2	19.7
7/2+7/1		Ryde Rd West Right Ahead Left	U+O	N/A	N/A	C1:7 -		641	1558:1800	713	89.9%	9.0	50.6	20.4
7/3		Ryde Rd West Right	U	N/A	N/A	C1:7		78	1698	146	53.6%	1.9	87.6	3.5
7/4+7/5		Ryde Rd West Right U-Turn	U	N/A	N/A	C1:7 C1:8		455	1698:1800	481	94.5%	9.6	76.0	11.4
8/2		Ryde Rd Exit	U	N/A	N/A	-		329	3600	3600	9.1%	0.1	0.6	0.1
EB Ped Link P1		Mona Vale Rd North	-	N/A	-	C1:9		3	-	32400	0.0%	0.0	21.6	0.1
EB Ped Link P2		Ryde Rd South	-	N/A	-	C1:9		11	-	32400	0.0%	0.1	21.6	0.2
				N/A							68.1%	11.1		
1/1		Pacific Hwy North Ahead	U	N/A	N/A	C2:1		590	1800	1800	32.8%	0.2	1.5	0.2
1/2		Pacific Hwy North Ahead	U	N/A	N/A	C2:1		527	1800	1800	29.3%	0.2	1.4	0.2
1/3+1/4		Pacific Hwy North Ahead Right	U+O	N/A	N/A	C2:1 C2:2		1226	1800:1800	1800	68.1%	1.9	5.7	3.1
3/1		Pacific Hwy South Ahead Left	U	N/A	N/A	C2:3		733	1776	1294	56.6%	0.9	4.7	13.0
3/2		Pacific Hwy South Ahead	U	N/A	N/A	C2:3		867	1916	1423	50.9%	1.3	5.6	6.7
3/3		Pacific Hwy South Ahead	U	N/A	N/A	C2:3		900	1916	1423	53.2%	1.3	5.3	4.7
5/2+5/1		Bridge St West Left	U	N/A	N/A	C2:4		293	1492:1352	487	60.2%	5.1	62.8	6.3
EB Ped Link P1		Bridge St	-	N/A	-	C2:5		0	-	53486	0.0%	0.0	0.0	0.0

PRC for Signalled Lanes (%):	-5.1	Total Delay for Signalled Lanes (pcuHr):	97.61
PRC for Signalled Lanes (%):	32.1	Total Delay for Signalled Lanes (pcuHr):	11.13
PRC Over All Lanes (%):	-5.1	Total Delay Over All Lanes (pcuHr):	108.99
		Cycle Time (s):	140

Network Results View

☒ All
 ☐ Stream
 ☐ Lane
 ☐ Route

☐ Show Exit Lanes
 ☐ Show Route Layers

PCUs and Capacity Values
 ☒ Display Per Period
 ☐ Display Per Cycle

Columns

View Type
 ☒ Tree View
 ☐ Flat View

Column Set 1:

Column Set 2:

Item	Item Desc	Line Type	Cl	Stm	Pos	Rel	Full	SG	Arr	Flow	Sat Flow	Cap	Deg	TDly	s/pcu	Dly	MMQ
Network																	
11: Pacific Hwy/Ryde Rd/Mona Vale Rd																	
1/2+1/1	Pacific Hwy North Ahead Left	U	N/A	N/A						907	1800:1800	796	113.9%	411.5	286.9	132.9	
1/3	Pacific Hwy North Ahead	U	N/A	N/A						877	1800	771	113.7%	72.8	298.6	96.5	
1/4	Pacific Hwy North Ahead	U	N/A	N/A						856	1800	771	107.3%	46.4	202.0	68.6	
1/5	Pacific Hwy North Right	U	N/A	N/A						283	1800	283	96.7%	10.2	134.7	16.8	
1/6	Pacific Hwy North Right	U	N/A	N/A						283	1800	283	96.7%	10.2	134.7	16.8	
4/2+4/1	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A						432	1744:1800	376	114.8%	38.3	319.2	45.4	
4/3+4/4	Mona Vale Rd East U-Turn Right	U	N/A	N/A						264	1744:1800	232	114.0%	26.2	357.5	30.8	
5/2+5/1	Pacific Hwy South Ahead Left	U+O	N/A	N/A						680	1800:1800	940	72.3%	5.9	31.4	17.1	
5/3	Pacific Hwy South Ahead	U	N/A	N/A						518	1800	771	67.1%	5.6	39.1	17.1	
5/4	Pacific Hwy South Ahead	U	N/A	N/A						508	1800	771	65.9%	5.5	38.6	16.6	
5/5	Pacific Hwy South Right	U	N/A	N/A						304	1800	270	112.6%	27.8	329.7	33.8	
7/2+7/1	Ryde Rd West Right Ahead Left	U+O	N/A	N/A						561	1558:1800	516	108.8%	32.9	211.0	42.9	
7/3	Ryde Rd West Right	U	N/A	N/A						248	1698	230	107.6%	18.5	269.2	23.7	
7/4+7/5	Ryde Rd West Right U-Turn	U	N/A	N/A						589	1698:1800	539	109.4%	36.2	221.2	40.7	
8/2	Ryde Rd Exit	U	N/A	N/A						291	3600	3600	7.8%	0.0	0.5	0.0	
Ped Link: P1	Mona Vale Rd North	-	N/A	-						8	-	30857	0.0%	0.1	23.3	0.2	
Ped Link: P2	Ryde Rd South	-	N/A	-						14	-	30857	0.1%	0.1	23.3	0.3	
12: Pacific Hwy/Bridge St																	
1/1	Pacific Hwy North Ahead	U	N/A	N/A						907	1800	1556	58.3%	1.4	5.4	10.3	
1/2	Pacific Hwy North Ahead	U	N/A	N/A						877	1800	1556	56.4%	1.3	5.2	9.7	
1/3+1/4	Pacific Hwy North Ahead Right	U+O	N/A	N/A						1690	1800:1800	1633	103.5%	51.0	108.7	111.8	
3/2+3/1	Pacific Hwy South Ahead Left	U	N/A	N/A						765	1776:1800	1250	59.5%	1.2	6.0	14.2	
3/3	Pacific Hwy South Ahead	U	N/A	N/A						704	1916	1259	55.1%	1.2	6.2	5.0	
3/4	Pacific Hwy South Ahead	U	N/A	N/A						806	1916	1259	61.7%	1.3	5.9	3.3	
5/2+5/1	Bridge St West Left	U	N/A	N/A						180	1492:1352	614	29.3%	2.3	45.4	3.1	
Ped Link: P1	Bridge St	-	N/A	-						12	-	47314	0.0%	0.0	8.5	0.2	
Ped Link: P2	Pacific Hwy South	-	N/A	-						0	-	3600	0.0%	0.0	0.0	0.0	
13: Ryde Rd/West St																	
1/1	West St North Left	U	N/A	N/A						72	1730	161	44.8%	1.6	80.2	3.0	
1/2	West St North Left	U	N/A	N/A						112	1730	161	59.7%	3.0	97.0	5.3	
2/1	Ryde Rd Exit Ahead	U	N/A	N/A						706	1730	1730	40.8%	0.3	1.8	0.3	
2/2	Ryde Rd Exit Ahead Ahead2	U	N/A	N/A						1210	1870	1870	64.7%	0.9	2.7	0.9	
2/3	Ryde Rd Exit Ahead	U	N/A	N/A						1213	1870	1870	64.9%	0.9	2.7	0.9	

C1	PRC for Signalled Lanes (%):	-27.6	Total Delay for Signalled Lanes (pcuHr):	411.50
C2	PRC for Signalled Lanes (%):	-15.0	Total Delay for Signalled Lanes (pcuHr):	59.59
C3	PRC for Signalled Lanes (%):	21.7	Total Delay for Signalled Lanes (pcuHr):	13.58
	PRC Over All Lanes (%):	-27.6	Total Delay Over All Lanes (pcuHr):	486.88
			Cycle Time (s):	140

Network Results View

Filter
☒ All
☐ Lane
☐ Stream
☐ Route
☐ Show Exit Lanes
☐ Show Route Layers

PCUs and Capacity Values
☒ Display Per Period
☐ Display Per Cycle

Tree
☒ Collapse
☐ Expand

Columns

View Type
☒ Tree View
☐ Flat View

Column Set 1:

 Column Set 2:

Item	Item Desc	Lane	Typ	Dir	Rte	Pos	Full	SG	Flow	Cap	Deg	TDly	Dly	MMQ
Network														
1/1 Pacific Hwy/Ryde Rd/Mona Vale Rd														
1/2+1/1														
1/3	Pacific Hwy North Ahead Left	U	N/A	N/A	N/A		C1:1		613	1800:1800	730	84.0%	7.8	45.8 22.5
1/4	Pacific Hwy North Ahead	U	N/A	N/A	N/A		C1:1		555	1800	681	81.4%	7.9	51.0 21.4
1/5	Pacific Hwy North Ahead	U	N/A	N/A	N/A		C1:1		492	1800	681	72.2%	6.1	44.5 15.3
1/6	Pacific Hwy North Right	U	N/A	N/A	N/A		C1:2		346	1800	476	72.7%	5.5	56.8 13.5
4/2+4/1	Pacific Hwy North Right	U	N/A	N/A	N/A		C1:2		342	1800	476	71.9%	5.3	56.2 13.3
4/3+4/4	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A	N/A		C1:5		279	1744:1800	284	98.2%	9.6	123.4 12.8
5/2+5/1	Mona Vale Rd East U-Turn Right	U	N/A	N/A	N/A		C1:5 C1:6		250	1744:1800	256	97.5%	9.3	133.6 12.2
5/3	Pacific Hwy South Ahead Left	U+O	N/A	N/A	N/A		C1:3		934	1800:1800	960	97.3%	17.5	67.4 34.5
5/4	Pacific Hwy South Ahead	U	N/A	N/A	N/A		C1:3		649	1800	681	95.2%	14.6	81.1 31.5
5/5	Pacific Hwy South Ahead	U	N/A	N/A	N/A		C1:3		648	1800	681	95.1%	14.5	80.4 31.2
7/2+7/1	Pacific Hwy South Right	U	N/A	N/A	N/A		C1:4		445	1800	463	96.1%	13.3	107.9 24.0
7/3	Ryde Rd West Right Ahead Left	U+O	N/A	N/A	N/A		C1:7		606	1538:1800	564	91.3%	8.6	50.9 23.7
7/4+7/5	Ryde Rd West Right	U	N/A	N/A	N/A		C1:7		147	1698	194	75.9%	3.3	81.7 6.9
8/2	Ryde Rd West Right U-Turn	U	N/A	N/A	N/A		C1:7 C1:8		547	1698:1800	583	93.8%	9.4	61.9 12.6
Ped Link: P1	Ryde Rd Exit	U	N/A	N/A	N/A				344	3600	3600	9.6%	0.1	0.6 0.1
Ped Link: P2	Mona Vale Rd North	-	N/A	-	N/A		C1:9		3	-	27257	0.0%	0.0	27.5 0.1
1/1 Pacific Hwy/Bridge St														
1/2	Ryde Rd South	-	N/A	-	N/A		C1:9		11	-	27257	0.0%	0.1	27.5 0.3
1/3+1/4	Pacific Hwy North Ahead	U	N/A	N/A	N/A		C2:1		613	1800	1556	39.4%	0.7	3.9 5.1
3/2+3/1	Pacific Hwy North Ahead	U	N/A	N/A	N/A		C2:1		555	1800	1556	35.7%	0.6	3.7 4.4
3/3	Pacific Hwy North Ahead Right	U+O	N/A	N/A	N/A		C2:1 C2:2		1331	1800:1800	1610	82.7%	6.1	16.4 21.3
3/4	Pacific Hwy South Ahead Left	U	N/A	N/A	N/A		C2:3		825	1776:1800	1249	66.0%	1.7	7.5 20.3
5/2+5/1	Pacific Hwy South Ahead	U	N/A	N/A	N/A		C2:3		876	1916	1328	66.0%	1.8	7.2 5.6
Ped Link: P1	Pacific Hwy South Ahead	U	N/A	N/A	N/A		C2:3		920	1916	1328	69.3%	1.8	6.9 4.9
Ped Link: P2	Bridge St West Left	U	N/A	N/A	N/A		C2:4		383	1492:1352	564	68.0%	6.3	58.9 8.0
1/1 Ryde Rd/West St	Bridge St	-	N/A	-	N/A		C2:5		0	-	49886	0.0%	0.0	0.0 0.0
1/2	Pacific Hwy South	-	N/A	-	N/A		C2:6		0	-	3600	0.0%	0.0	0.0 0.0
2/1	West St North Left	U	N/A	N/A	N/A		C3:1		161	1730	395	40.7%	2.4	53.6 5.7
2/2	West St North Left	U	N/A	N/A	N/A		C3:1		364	1730	395	52.1%	9.8	97.3 18.3
2/3	Ryde Rd Exit Ahead	U	N/A	N/A	N/A				1036	1730	1730	59.9%	0.7	2.6 0.7
	Ryde Rd Exit Ahead Ahead2	U	N/A	N/A	N/A				1296	1870	1870	69.3%	1.1	3.1 1.1
	Ryde Rd Exit Ahead	U	N/A	N/A	N/A				1297	1870	1870	69.4%	1.1	3.1 1.1

C1	PRC for Signalled Lanes (%):	-9.2	Total Delay for Signalled Lanes (pcuHr):	132.60
C2	PRC for Signalled Lanes (%):	8.9	Total Delay for Signalled Lanes (pcuHr):	18.79
C3	PRC for Signalled Lanes (%):	-2.3	Total Delay for Signalled Lanes (pcuHr):	34.17
	PRC Over All Lanes (%):	-9.2	Total Delay Over All Lanes (pcuHr):	188.61
			Cycle Time (s):	140

Network Results View

Filter: ☐ All ☐ Stream ☐ Lane ☐ Route

☐ Show Exit Lanes ☐ Show Route Layers

PCUs and Capacity Values: ☐ Display Per Period ☐ Display Per Cycle

Columns:

Column Set 1:

Column Set 2:

Item	Item Desc	Line	Cl	Rte	Pos	Full	SG	Arr	Flow	Sat Flow	Cap	Deg	TDly	Dly	MMQ
Network															
1/2+1/1	Pacific Hwy North Ahead Left	U	N/A	N/A		C1:1			918	1800:1800	813	112.8%	71.2	279.4	130.4
1/3	Pacific Hwy North Ahead	U	N/A	N/A		C1:1			884	1800	784	112.6%	69.0	281.3	93.2
1/4	Pacific Hwy North Ahead	U	N/A	N/A		C1:1			893	1800	784	107.6%	48.2	205.5	71.1
1/5	Pacific Hwy North Right	U	N/A	N/A		C1:2			297	1800	283	102.3%	14.9	186.0	21.8
1/6	Pacific Hwy North Right	U	N/A	N/A		C1:2			297	1800	283	102.3%	14.9	186.0	21.8
4/2+4/1	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A		C1:5			433	1744:1800	375	115.4%	39.4	327.5	46.6
4/3+4/4	Mona Vale Rd East U-Turn Right	U	N/A	N/A		C1:5 C1:6			263	1744:1800	232	113.5%	25.6	350.8	30.1
5/2+5/1	Pacific Hwy South Ahead Left	U+O	N/A	N/A		C1:3			687	1800:1800	949	72.4%	5.9	31.0	17.3
5/3	Pacific Hwy South Ahead	U	N/A	N/A		C1:3			495	1800	784	63.1%	5.1	36.9	15.7
5/4	Pacific Hwy South Ahead	U	N/A	N/A		C1:3			521	1800	784	66.4%	5.5	38.2	17.0
5/5	Pacific Hwy South Right	U	N/A	N/A		C1:4			304	1800	270	112.6%	27.8	329.7	33.8
7/2+7/1	Ryde Rd West Right Ahead Left	U+O	N/A	N/A		C1:7			560	1558:1800	513	109.2%	33.7	216.3	42.9
7/3	Ryde Rd West Right	U	N/A	N/A		C1:7			233	1698	218	106.7%	17.0	262.0	21.8
7/4+7/5	Ryde Rd West Right U-Turn	U	N/A	N/A		C1:7 C1:8			540	1698:1800	493	109.5%	34.0	226.6	38.3
8/2	Ryde Rd Exit	U	N/A	N/A					305	3600	3600	8.1%	0.0	0.5	0.0
Ped Link: P1	Mona Vale Rd North	-	N/A	-		C1:9			8	-	31371	0.0%	0.1	22.7	0.2
Ped Link: P2	Ryde Rd South	-	N/A	-		C1:9			14	-	31371	0.1%	0.1	22.7	0.3
1/1	Pacific Hwy North Ahead	U	N/A	N/A		C2:1			917	1800	1556	58.9%	1.4	5.4	10.4
1/2	Pacific Hwy North Ahead	U	N/A	N/A		C2:1			881	1800	1556	56.6%	1.3	5.2	9.7
1/3+1/4	Pacific Hwy North Ahead Right	U+O	N/A	N/A		C2:1 C2:2			1669	1800:1800	1634	102.1%	40.4	87.1	101.7
3/2+3/1	Pacific Hwy South Ahead Left	U	N/A	N/A		C2:3			780	1776:1800	1158	65.1%	1.6	7.8	14.9
3/3	Pacific Hwy South Ahead	U	N/A	N/A		C2:3			712	1916	1163	59.7%	1.8	9.4	20.1
3/4	Pacific Hwy South Ahead	U	N/A	N/A		C2:3			784	1916	1163	64.9%	1.7	8.3	4.7
5/2+5/1	Bridge St West Right Left	U	N/A	N/A		C2:5 C2:4			270	1492:1352	227	119.2%	30.8	410.6	30.8
Ped Link: P1	Bridge St	-	N/A	-		C2:6			12	-	43714	0.0%	0.0	11.1	0.2
Ped Link: P2	Pacific Hwy South	-	N/A	-		C2:7			0	-	3600	0.0%	0.0	0.0	0.0
1/1	West St North Left	U	N/A	N/A		C3:1			34	1730	99	34.4%	0.9	91.0	1.5
1/2	West St North Left	U	N/A	N/A		C3:1			58	1730	99	58.7%	1.7	107.0	2.9
2/1	Ryde Rd Exit Ahead	U	N/A	N/A					676	1730	1730	39.1%	0.3	1.7	0.3
2/2	Ryde Rd Exit Ahead Ahead2	U	N/A	N/A					1176	1870	1870	62.9%	0.8	2.6	0.8
2/3	Ryde Rd Exit Ahead	U	N/A	N/A					1181	1870	1870	63.2%	0.9	2.6	0.9
3/1	Ryde Rd West Ahead Left	U	N/A	N/A		C3:2			1027	1730	1471	69.8%	2.3	7.9	15.7
3/2	Ryde Rd West Ahead	U	N/A	N/A		C3:2			1150	1870	1630	70.6%	2.2	6.7	15.9

C1	PRC for Signalled Lanes (%):	-28.3	Total Delay for Signalled Lanes (pcuHr):	412.28
C2	PRC for Signalled Lanes (%):	-32.4	Total Delay for Signalled Lanes (pcuHr):	79.02
C3	PRC for Signalled Lanes (%):	27.5	Total Delay for Signalled Lanes (pcuHr):	9.14
	PRC Over All Lanes (%):	-32.4	Total Delay Over All Lanes (pcuHr):	502.50
			Cycle Time (s):	140

Network Results View

Filter: ☒ All ☐ Stream ☐ Lane ☐ Route ☐ Show Exit Lanes ☐ Show Route Layers	PCs and Capacity Values: ☒ Display Per Period ☐ Display Per Cycle	Tree: Collapse Expand	Columns: Customise... Column Set 1: Use Column Set 2: Save	View Type: ☒ Tree View ☐ Flat View
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Item	Item	Line	CU	Rte	Ful	Ar	Flw	Sat Flow	Cap	Deg	IDly	Dly	MMQ
	Desc	Typ	Stm	Pos	SG	SG	pcu	pcu/Hr	pcu	Sat	pcu/h	s/pcu	pcu
Network													
31: Pacific Hwy/Ryde Rd/Mona Vale Rd										110.6%	443.4		
1/2+1/1	Pacific Hwy North Ahead Left	U	N/A	N/A	C1:1 -		669	1800:1800	676	98.7%	16.2	87.6	34.5
1/3	Pacific Hwy North Ahead	U	N/A	N/A	C1:1		591	1800	604	97.6%	15.2	93.0	31.6
1/4	Pacific Hwy North Ahead	U	N/A	N/A	C1:1		566	1800	604	91.3%	11.1	72.3	24.7
1/5	Pacific Hwy North Right	U	N/A	N/A	C1:2		396	1800	514	74.4%	6.4	60.6	15.0
1/6	Pacific Hwy North Right	U	N/A	N/A	C1:2		393	1800	514	74.0%	6.3	59.5	15.9
4/2+4/1	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A	C1:5 -		277	1744:1800	322	85.9%	5.0	65.2	7.9
4/3+4/4	Mona Vale Rd East U-Turn Right	U	N/A	N/A	C1:5 C1:6		250	1744:1800	294	84.9%	5.3	76.0	8.0
5/2+5/1	Pacific Hwy South Ahead Left	U+O	N/A	N/A	C1:3 -		937	1800:1800	877	106.8%	46.5	178.7	54.6
5/3	Pacific Hwy South Ahead	U	N/A	N/A	C1:3		638	1800	604	105.6%	34.7	195.8	51.0
5/4	Pacific Hwy South Ahead	U	N/A	N/A	C1:3		639	1800	604	105.7%	35.2	196.3	51.6
5/5	Pacific Hwy South Right	U	N/A	N/A	C1:4		445	1800	501	88.7%	9.5	76.9	20.1
7/2+7/1	Ryde Rd West Right Ahead Left	U+O	N/A	N/A	C1:7 -		576	1558:1800	639	90.1%	7.0	43.7	23.3
7/3	Ryde Rd West Right	U	N/A	N/A	C1:7		111	1698	194	57.2%	2.3	74.1	4.6
7/4+7/5	Ryde Rd West Right U-Turn	U	N/A	N/A	C1:7 C1:8		427	1698:1800	505	84.5%	6.1	51.6	8.7
8/2	Ryde Rd Exit	U	N/A	N/A	-		383	3600	3600	10.6%	0.1	0.6	0.1
9	Ped Link: P1	-	N/A	-	C1:9		3	-	24171	0.0%	0.0	31.4	0.1
10	Ped Link: P2	-	N/A	-	C1:9		11	-	24171	0.0%	0.1	31.4	0.3
12: Pacific Hwy/Bridge St										110.6%	216.7		
1/1	Pacific Hwy North Ahead	U	N/A	N/A	C2:1		654	1800	1299	50.4%	2.1	11.3	11.6
1/2	Pacific Hwy North Ahead	U	N/A	N/A	C2:1		576	1800	1299	44.4%	1.7	10.5	9.5
1/3+1/4	Pacific Hwy North Ahead Right	U+O	N/A	N/A	C2:1 C2:2		1194	1800:1800	1336	89.4%	9.4	28.3	38.3
3/2+3/1	Pacific Hwy South Ahead Left	U	N/A	N/A	C2:3		848	1776:1800	740	109.3%	49.3	219.2	73.7
3/3	Pacific Hwy South Ahead	U	N/A	N/A	C2:3		887	1916	780	109.4%	52.5	221.5	77.7
3/4	Pacific Hwy South Ahead	U	N/A	N/A	C2:3		888	1916	780	109.4%	53.1	224.2	77.7
5/2+5/1	Bridge St West Right Left	U	N/A	N/A	C2:5 C2:4		642	1492:1352	580	110.6%	48.7	273.0	58.0
6	Ped Link: P1	-	N/A	-	C2:6		0	-	29314	0.0%	0.0	0.0	0.0
7	Ped Link: P2	-	N/A	-	C2:7		0	-	13886	0.0%	0.0	0.0	0.0
13: Ryde Rd/West St										81.4%	16.7		
1/1	West St North Left	U	N/A	N/A	C3:1		69	1730	235	29.4%	1.3	65.3	2.6
1/2	West St North Left	U	N/A	N/A	C3:1		191	1730	235	81.4%	5.1	96.4	9.2
2/1	Ryde Rd Exit Ahead	U	N/A	N/A	-		947	1730	1730	54.7%	0.6	2.3	0.6
2/2	Ryde Rd Exit Ahead Ahead2	U	N/A	N/A	-		1204	1870	1870	64.4%	0.9	2.7	0.9
2/3	Ryde Rd Exit Ahead	U	N/A	N/A	-		1205	1870	1870	64.4%	0.9	2.7	0.9
3/1	Ryde Rd West Ahead Left	U	N/A	N/A	C3:2		956	1730	1335	71.6%	3.4	12.9	20.1
3/2	Ryde Rd West Ahead	U	N/A	N/A	C3:2		1109	1870	1493	74.8%	3.7	12.2	23.3

C1	PRC for Signalled Lanes (%):	-18.7	Total Delay for Signalled Lanes (pcu*H):	206.92
C2	PRC for Signalled Lanes (%):	-22.9	Total Delay for Signalled Lanes (pcu*H):	216.72
C3	PRC for Signalled Lanes (%):	10.6	Total Delay for Signalled Lanes (pcu*H):	17.29
	PRC Over All Lanes (%):	-22.9	Total Delay Over All Lanes (pcu*H):	443.39
			Cycle Time (s):	140

Network Results View

Filter: ☒ All ☐ Stream ☐ Lane ☐ Route

☐ Show Exit Lanes ☐ Show Route Layers

PCUs and Capacity Values

☒ Display Per Period ☐ Display Per Cycle

Tree

☐ Collapse ☒ Expand

Columns

Customise... ☐ Column Set 1: Use ☐ Column Set 2: Use

View Type

☒ Tree View ☐ Flat View

Item	Item Desc	Lane Type	Dir	Pos	Full SG	Flow PCU	Set Flow PCU/Hr	Cap PCU	Desat Sat	IDly PCU	Dly s/PCU	MMQ PCU
Network												
1/2+1/1	Pacific Hwy North Ahead Left	U	N/A	N/A	C1:1	903	1800:1800	809	111.6%	377.9	283.0	123.9
1/3	Pacific Hwy North Ahead	U	N/A	N/A	C1:1	873	1800	784	111.3%	64.0	283.8	87.5
1/4	Pacific Hwy North Ahead	U	N/A	N/A	C1:1	864	1800	784	110.2%	58.8	244.9	82.2
1/5	Pacific Hwy North Right	U	N/A	N/A	C1:2	203	1800	296	95.7%	10.3	130.5	16.7
1/6	Pacific Hwy North Right	U	N/A	N/A	C1:2	203	1800	296	95.7%	10.3	130.5	16.7
4/2+4/1	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A	C1:5	431	1744:1800	390	110.5%	30.6	255.4	37.9
4/3+4/4	Mona Vale Rd East U-Turn Right	U	N/A	N/A	C1:5	285	1744:1800	244	108.6%	20.6	280.5	25.6
5/2+5/1	Pacific Hwy South Ahead Left	U+O	N/A	N/A	C1:3	679	1800:1800	953	71.2%	5.7	30.5	16.8
5/3	Pacific Hwy South Ahead	U	N/A	N/A	C1:3	518	1800	784	66.0%	5.5	38.0	16.8
5/4	Pacific Hwy South Ahead	U	N/A	N/A	C1:3	509	1800	784	64.9%	5.3	37.6	16.5
5/5	Pacific Hwy South Right	U	N/A	N/A	C1:4	304	1800	283	107.5%	21.3	258.1	28.1
7/2+7/1	Ryde Rd West Right Ahead Left	U+O	N/A	N/A	C1:7	641	1558:1800	618	103.8%	29.0	152.8	31.8
7/3	Ryde Rd West Right	U	N/A	N/A	C1:7	207	1698	194	106.7%	15.3	266.8	19.7
7/4+7/5	Ryde Rd West Right U-Turn	U	N/A	N/A	C1:7	551	1698:1800	502	109.8%	34.7	227.0	38.2
8/2	Ryde Rd Exit	U	N/A	N/A	-	305	3600	3600	8.5%	0.0	0.5	0.0
Ped Link: P1	Mona Vale Rd North	-	N/A	-	C1:9	8	-	34457	0.0%	0.0	19.4	0.2
Ped Link: P2	Ryde Rd South	-	N/A	-	C1:9	14	-	34457	0.1%	0.1	19.4	0.3
Pacific Hwy North Ahead		U	N/A	N/A	C2:1	903	1800	1684	96.4%	21.8	2.9	5.1
Pacific Hwy North Ahead		U	N/A	N/A	C2:1	873	1800	1684	51.8%	0.7	2.8	4.7
Pacific Hwy North Ahead Right		U+O	N/A	N/A	C2:1 C2:2	1698	1800:1800	1761	96.4%	15.1	31.9	32.2
Pacific Hwy South Ahead Left		U	N/A	N/A	C2:3	763	1776:1800	1301	58.0%	1.0	5.0	14.1
Pacific Hwy South Ahead		U	N/A	N/A	C2:3	710	1916	1314	53.8%	0.9	4.7	7.0
Pacific Hwy South Ahead		U	N/A	N/A	C2:3	802	1915	1314	59.7%	0.9	4.2	2.4
Bridge St West Left		U	N/A	N/A	C2:4	180	1492:1352	574	31.4%	2.5	49.1	3.2
Bridge St		-	N/A	-	C2:5	12	-	49371	0.0%	0.0	7.1	0.1
Pacific Hwy South		-	N/A	-	C2:6	0	-	3600	0.0%	0.0	0.0	0.0
West St North Left		U	N/A	N/A	-	-	-	-	75.5%	15.7	-	-
West St North Left		U	N/A	N/A	C3:1	73	1730	148	49.2%	1.7	84.7	3.2
Ryde Rd Exit Ahead		U	N/A	N/A	C3:1	112	1730	148	75.5%	3.4	108.6	5.7
Ryde Rd Exit Ahead Ahead2		U	N/A	N/A	-	731	1730	1730	42.3%	0.4	1.8	0.4
Ryde Rd Exit Ahead		U	N/A	N/A	-	1194	1870	1870	63.9%	0.9	2.7	0.9
Ryde Rd Exit Ahead		U	N/A	N/A	-	1205	1870	1870	64.4%	0.9	2.7	0.9

C1	PRC for Signalled Lanes (%):	-24.0	Total Delay for Signalled Lanes (pcuHr):	377.83
C2	PRC for Signalled Lanes (%):	-7.1	Total Delay for Signalled Lanes (pcuHr):	21.78
C3	PRC for Signalled Lanes (%):	19.2	Total Delay for Signalled Lanes (pcuHr):	13.55
	PRC Over All Lanes (%):	-24.0	Total Delay Over All Lanes (pcuHr):	415.40
			Cycle Time (s):	140

Network Results View

☒ All
 ☐ Stream
 ☐ Lane
 ☐ Route

☒ Show Exit Lanes
 ☐ Show Route Layers

Filter

Columns

Customise...

Column Set 1:

Use

Save

Column Set 2:

Use

Save

Tree

Collapse

Expand

PCUs and Capacity Values

☒ Display Per Period
 ☐ Display Per Cycle

View Type

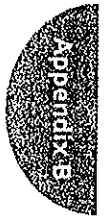
☒ Tree View
 ☐ Flat View

Item	Item	Line Type	Dir	Sim	Pos	Rel	Full	Arr	Flow	Sat Flow	Cap	Dec	TDly	Dly	MMQ
	Desc							SG	pcu	pcu/hr	pcu	Sec	pcu	sec	pcu
Network															
11: Pacific Hwy/Ryde Rd/Mona Vale Rd															
1/2+1/1	Pacific Hwy North Ahead Left	U	N/A	N/A			C1:1		602	1800:1800	718	83.8%	8.0	47.6	22.0
1/3	Pacific Hwy North Ahead	U	N/A	N/A			C1:1		542	1800	669	81.1%	8.0	52.9	20.9
1/4	Pacific Hwy North Ahead	U	N/A	N/A			C1:1		516	1800	669	77.2%	7.1	49.5	19.0
1/5	Pacific Hwy North Right	U	N/A	N/A			C1:2		346	1800	476	72.7%	5.7	59.6	13.5
1/6	Pacific Hwy North Right	U	N/A	N/A			C1:2		342	1800	476	71.9%	5.6	59.1	13.3
4/2+4/1	Mona Vale Rd East Left Right Ahead	U+O	N/A	N/A			C1:5		279	1744:1800	259	107.9%	18.1	233.1	21.6
4/3+4/4	Mona Vale Rd East U-Turn Right	U	N/A	N/A			C1:5		250	1744:1800	231	108.2%	18.2	262.8	21.6
5/2+5/1	Pacific Hwy South Ahead Left	U+O	N/A	N/A			C1:3		935	1800:1800	946	98.8%	20.2	77.9	37.9
5/3	Pacific Hwy South Ahead	U	N/A	N/A			C1:3		649	1800	669	97.1%	16.5	91.8	33.5
5/4	Pacific Hwy South Ahead	U	N/A	N/A			C1:3		648	1800	669	96.9%	16.4	90.9	33.2
5/5	Pacific Hwy South Right	U	N/A	N/A			C1:4		445	1800	463	96.1%	13.3	107.9	24.0
7/2+7/1	Ryde Rd West Right Ahead Left	U+O	N/A	N/A			C1:7		598	1558:1800	660	90.7%	8.0	48.4	24.1
7/3	Ryde Rd West Right	U	N/A	N/A			C1:7		136	1698	230	59.0%	2.3	60.4	5.4
7/4+7/5	Ryde Rd West Right U-Turn	U	N/A	N/A			C1:7		565	1698:1800	651	86.8%	6.7	42.5	10.5
8/2	Ryde Rd Exit	U	N/A	N/A					346	3600	3600	9.6%	0.1	0.6	0.1
Ped Link: P1	Mona Vale Rd North	-	N/A	-			C1:9		3	-	29823	0.0%	0.0	24.4	0.1
Ped Link: P2	Ryde Rd South	-	N/A	-			C1:9		11	-	29823	0.0%	0.1	24.4	0.3
12: Pacific Hwy/Bridge St															
1/1	Pacific Hwy North Ahead	U	N/A	N/A			C2:1		602	1800	1684	35.7%	0.4	2.1	2.5
1/2	Pacific Hwy North Ahead	U	N/A	N/A			C2:1		542	1800	1684	32.2%	0.3	2.0	2.0
1/3+1/4	Pacific Hwy North Ahead Right	U+O	N/A	N/A			C2:1 C2:2		1355	1800:1800	1738	76.0%	4.3	11.5	10.8
3/2+3/1	Pacific Hwy South Ahead Left	U	N/A	N/A			C2:3		817	1776:1800	1262	64.6%	1.6	7.2	19.8
3/3	Pacific Hwy South Ahead	U	N/A	N/A			C2:3		884	1916	1341	65.7%	1.7	6.8	5.9
3/4	Pacific Hwy South Ahead	U	N/A	N/A			C2:3		920	1916	1341	68.0%	1.7	6.6	5.0
5/2+5/1	Bridge St West Left	U	N/A	N/A			C2:4		383	1492:1352	553	69.2%	6.4	60.4	8.2
Ped Link: P1	Bridge St	-	N/A	-			C2:5		0	-	50400	0.0%	0.0	0.0	0.0
Ped Link: P2	Pacific Hwy South	-	N/A	-			C2:6		0	-	3600	0.0%	0.0	0.0	0.0
3/5: Ryde Rd/West St															
1/1	West St North Left	U	N/A	N/A			C3:1		160	1730	408	39.2%	2.3	52.3	5.5
1/2	West St North Left	U	N/A	N/A			C3:1		362	1730	408	88.8%	8.6	85.9	17.0
2/1	Ryde Rd Exit Ahead	U	N/A	N/A					1038	1730	1730	60.0%	0.7	2.6	0.7
2/2	Ryde Rd Exit Ahead Ahead2	U	N/A	N/A					1294	1870	1870	69.2%	1.1	3.1	1.1
2/3	Ryde Rd Exit Ahead	U	N/A	N/A					1296	1870	1870	69.3%	1.1	3.1	1.1

C1	PRC for Signalled Lanes (%):	-20.3	Total Delay for Signalled Lanes (pcu*hr):	154.15
C2	PRC for Signalled Lanes (%):	15.4	Total Delay for Signalled Lanes (pcu*hr):	16.40
C3	PRC for Signalled Lanes (%):	1.4	Total Delay for Signalled Lanes (pcu*hr):	34.14
	PRC Over All Lanes (%):	-20.3	Total Delay Over All Lanes (pcu*hr):	207.74
			Cycle Time (s):	140

Appendix B

SIDRA INTERSECTION Modelling Result



MOVEMENT SUMMARY

Site: 2011 AM

JS11530 - Pymble Business Park
Int of Ryde Rd & West St
2011 Weekday AM
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Ryde Rd (W)											
1	L	348	2.1	0.539	8.8	LOS A	0.0	0.0	0.00	1.04	53.1
2	T	2686	5.5	0.539	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		3035	5.1	0.539	1.0	LOS A	0.0	0.0	0.00	0.12	67.8
West: West Street											
10	L	143	2.9	0.757	55.9	LOS D	5.0	30.9	0.97	1.25	23.0
Approach		143	2.9	0.756	55.9	LOS D	5.0	30.9	0.97	1.25	23.0
All Vehicles		3178	5.0	0.757	3.5	NA	5.0	30.9	0.04	0.17	62.3

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on the worst delay for any vehicle movement.

Processed: Tuesday, 1 March 2011 3:08:34 PM
SIDRA INTERSECTION 4.0.19.1104
Project: P:\JS11000 - JS11990\JS11530 Pymble Business Park Traffic Assessment\Sidra & Scates\SIDRA\2011
Base\110225sid-JS11530 RydeRd_WestSt.sip
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**SIDRA
INTERSECTION**

MOVEMENT SUMMARY

Site: 2011 PM

JS11530 - Pymble Business Park
Int of Ryde Rd & West St
2011 Weekday PM
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Ryde Rd (W)											
1	L	82	0.0	0.523	8.7	LOS A	0.0	0.0	0.00	1.40	53.1
2	T	2948	1.6	0.524	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		3031	1.6	0.524	0.2	LOS A	0.0	0.0	0.00	0.04	69.5
West: West Street											
10	L	405	0.5	1.206	243.9	LOS F	57.2	316.0	1.00	4.05	8.0
Approach		405	0.5	1.206	243.9	LOS F	57.2	316.0	1.00	4.05	8.0
All Vehicles		3436	1.4	1.206	29.0	NA	57.2	316.0	0.12	0.51	36.5

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on the worst delay for any vehicle movement.

Processed: Tuesday, 1 March 2011 3:19:09 PM

SIDRA INTERSECTION 4.0.19.1104

Project: P:\JS11000 - JS11990\JS11530 Pymble Business Park Traffic Assessment\Sidra & Scates\SIDRA\2011

Base\110225sid-JS11530 RydeRd_WestSt.sip

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**SIDRA
INTERSECTION**

MOVEMENT SUMMARY

Site: 2021 PM_Scenario 2

JS11530 - Pymble Business Park
Int of Ryde Rd & West St
2021 Weekday PM - Scenario 2
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: Ryde Rd (W)												
1	L	98	1.1	0.569	8.8	LOS A	0.0	0.0	0.00	1.39	53.1	
2	T	3184	1.6	0.568	0.0	LOS A	0.0	0.0	0.00	0.00	70.0	
Approach		3282	1.6	0.568	0.3	LOS A	0.0	0.0	0.00	0.04	69.4	
West: West Street												
10	L	546	0.8	1.865	821.1	LOS F	169.9	941.6	1.00	7.20	2.6	
Approach		546	0.8	1.865	821.1	LOS F	169.9	941.6	1.00	7.20	2.6	
All Vehicles		3828	1.5	1.865	117.4	NA	169.9	941.6	0.14	1.06	15.2	

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

Approach LOS values are based on the worst delay for any vehicle movement.

Processed: Wednesday, 2 March 2011 3:44:43 PM
SIDRA INTERSECTION 4.0.19.1104

Project: P:\JS11000 - JS11990\JS11530 Pymble Business Park Traffic Assessment\Sidra & Scates\SIDRA\2011
Base\110225sid-JS11530 RydeRd_WestSt.sip
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**SIDRA
INTERSECTION**

MOVEMENT SUMMARY

Site: 2021 AM_Scenario 2

JS11530 - Pymble Business Park
Int of Ryde Rd & West St
2021 Weekday AM - Scenario 2
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh.	Average Speed km/h
South: Ryde Rd (W)											
1	L	396	2.1	0.585	8.8	LOS A	0.0	0.0	0.00	1.03	53.1
2	T	2901	5.5	0.586	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		3297	5.1	0.586	1.1	LOS A	0.0	0.0	0.00	0.12	67.7
West: West Street											
10	L	189	2.8	1.247	301.7	LOS F	32.1	197.7	1.00	2.96	6.6
Approach		189	2.8	1.245	301.7	LOS F	32.1	197.7	1.00	2.96	6.6
All Vehicles		3486	5.0	1.247	17.4	NA	32.1	197.7	0.05	0.28	45.1

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS F. LOS Method for individual vehicle movements: Delay (RTA NSW).

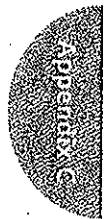
Approach LOS values are based on the worst delay for any vehicle movement.

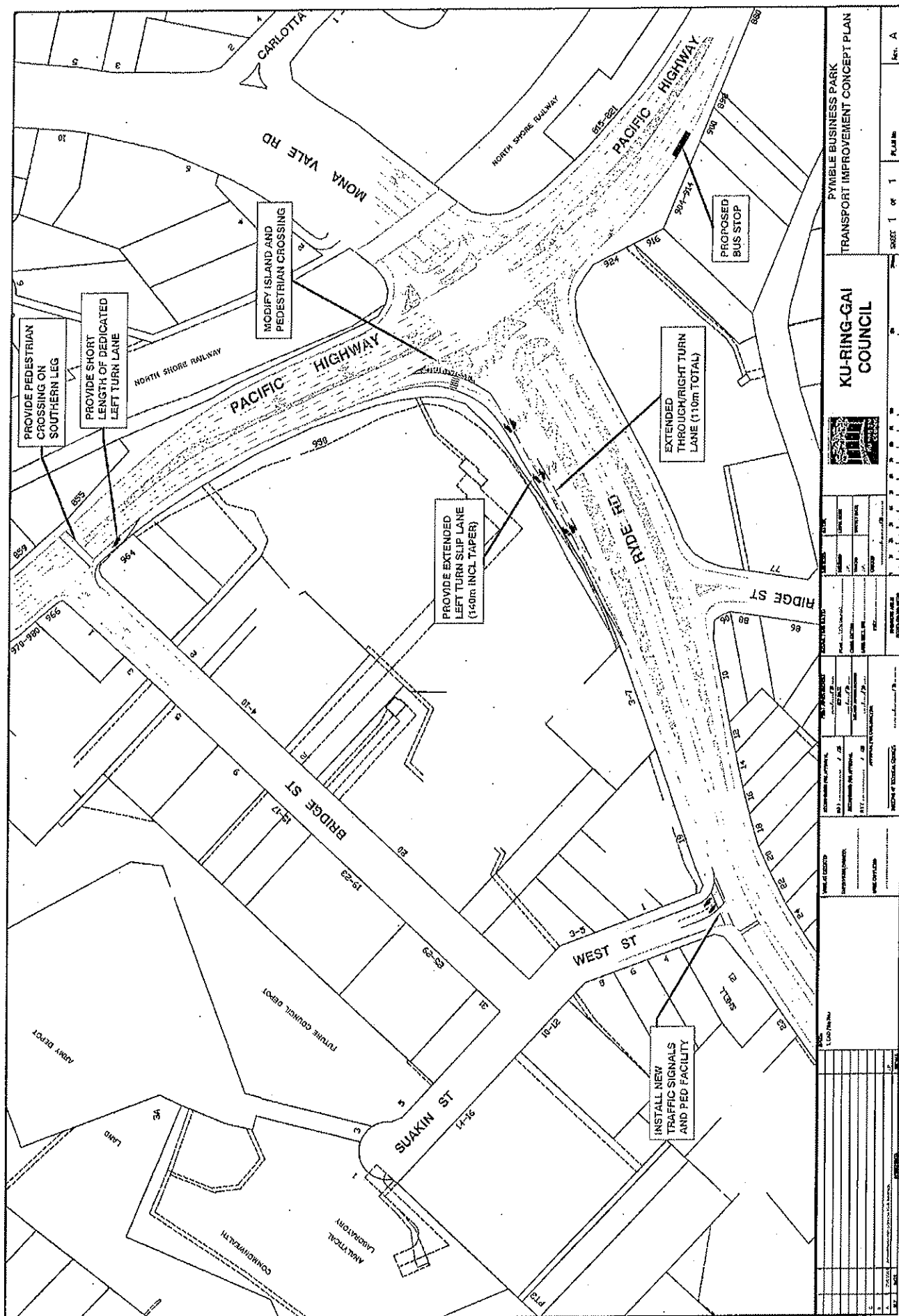
Processed: Wednesday, 2 March 2011 3:37:53 PM Copyright ©2000-2010 Akcelik & Associates Pty Ltd
SIDRA INTERSECTION 4.0.19.1104 www.sidrasolutions.com
Project: P:\JS11000 - JS11990\JS11530 Pymble Business Park Traffic Assessment\Sidra & Scates\SIDRA\2011
Base\110225sld-JS11530 RydeRd_WestSt.slp
8000086, GTA CONSULTANTS, FLOATING

**SIDRA
INTERSECTION**

Appendix C

Intersection Improvement Options





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